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EDITION

6

SIXTH EDITION

LANGE Q&A

SURGICAL TECHNOLOGY EXAMINATION

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Preface

Lange Q&A: Surgical Technology Examination, Sixth Edition, has been designed to assist surgical technicians planning to take the National Certification Exam for Surgical Technologists. Although unable to guarantee a perfect score, a study guide can provide a good deal of assistance in test preparation by enabling the student to review relevant material while becoming familiar with the type of questions that will be encountered on the exam.

The ever-growing body of knowledge necessary to prepare the surgical technologist for a professional role in the operating room requires that competency be measured by an exam that tests both constant and technologically up-to-date information. With this in mind, the authors have prepared a sixth edition of the review book that has been extensively revised and updated to include those advances in technology that have emerged since the previous edition.

The book contains over 1500 questions that closely correlate in percentage the amount prescribed in the Study Guide for Certification provided by the Liaison Council of the Association of Surgical Technologists. The text is divided into six main areas of concentration. Each section is further divided into chapters. Each question has one

answer, a full-length explanation, and a reference note for further study in the area. Difficulty in a single area indicates a need for individual study emphasis. On completion of the review, you are encouraged to use the CD-Rom to take as many practice tests as needed to gain confidence for exam day.

Acknowledgments

We would like to thank The Valley Hospital, Ridgewood, New Jersey for allowing us in to their operating room to take pictures of instruments that are included in this book.

Introduction

ORGANIZATION OF THE BOOK

The book is organized into six major sections consisting of 36 chapters covering the major topic areas found on the Certifying Examination for Surgical Technologists. Each section is designed to facilitate your review of the major content areas of surgical technology. In each chapter, you are given ample practice at honing your question-taking skills on a particular topic area. Each chapter ends with detailed explanations of each question for reinforcement of knowledge. Each of these explanations is referenced to a specific text where the information can be found so that you can supplement your study with further reading. Finally, there is a new CD-Rom with this edition that contains the entire question bank from the book. The software will allow you to practice taking a randomized or targeted tests and enable you to assess your areas of strength and weakness under simulated computerized exam conditions.

HOW TO ANSWER A QUESTION INTELLIGENTLY

Unlike many examinations, which are a composite of several multiple-choice question types, the National

Certification Exam for Surgical Technologists uses only one major type of question. Each question will have a “stem,” which presents a problem or asks a question. The stem is then followed by four choices, only one of which is entirely correct. “Distractors,” which are the choices other than the correct answer, may be partially correct; however, there can only be one **best** answer.

Although the question type is constant within the exam, the degree of difficulty may vary. Some questions require rote memory, some require problem solving, and others require evaluation and judgment. When the stem of the question takes on a negative aspect, the words “not” or “except,” is in capital letters to catch your eye and remind you that the correct answer will be the exception to the statement in the stem of the question.

Sample Question 1

A left subcostal incision indicates surgery of the

- (A) gallbladder
- (B) pancreas
- (C) spleen
- (D) common bile duct

This question could be answered from rote memory, placing the term “subcostal” with the anatomic structure “spleen.” It is more likely that the student will conjure up

a picture of the human abdomen and discount gallbladder (choice A) and common bile duct (choice D) immediately because they are located on the right side of the abdominal cavity. Thus, two choices are ruled out as possible answers, improving the odds of selecting the correct answer from 25 to 50%. Although the tail of the pancreas reaches over to the left side of the body and is adjacent to the spleen, spleen is clearly the best choice and the only correct answer.

Sample Question 2

An elderly female, sleeping soundly, arrives in the OR via stretcher with siderails in place and safety strap intact. She is placed alone outside her assigned OR. The woman awakes, climbs off the stretcher, and, falling, receives a deep scalp laceration. The circulating nurse

- (A) can be charged with abandonment
- (B) can be charged with simple assault
- (C) can be charged with battery
- (D) cannot be charged because safety devices were in place

This question is more difficult. Although we clearly see choices B and C as incorrect because the nurse had no physical part in the injury to the patient, the difficulty is now in choosing between the remaining answers. Choice

D may seem correct because the stem of the questions tells us that all safety devices were intact. It is only with knowledge of the legal aspect of OR procedure that we know that the key word *alone* signifies culpability on the part of the nurse. Standard OR procedures claim that one is guilty of abandonment if a patient is left *alone* at any time when in the care of OR personnel and may be charged as such in a court of law.

TABLE 1. STRATEGIES FOR ANSWERING QUESTIONS*

1. Remember that only one choice can be the correct answer.
2. Read the question carefully to be sure that you understand what is being asked.
3. Quickly read each choice for familiarity. (This important step is often not done by test takers.)
4. Go back and consider each choice individually.
5. If a choice is partially correct, tentatively consider it to be incorrect. (This step will help you lessen your choices and increase your odds of choosing the correct choice/answer.)
6. Consider the remaining choices, and select the one

you think is the answer. At this point, you may want to quickly scan the stem to be sure you understand the question and your answer.

7. Select the appropriate answer. Even if you do not know the answer, you should at least guess—you are scored on the number of correct answers, so do not leave any blanks.

* Note that steps 2 through 7 should take an average of 45 to 55 seconds total. The actual examination is timed for an average of 45 to 55 seconds per question.

HOW TO USE THE BOOK

It will probably be the most efficient use of your time to follow the book from front to back, chapter to chapter, answering questions and noting difficult areas after completion of a section or subsection. Continual notation in this book (or on a small notepad) of general areas, as well as subspecialty areas, will provide you with a quick review at the end of the chapter. This will help you determine those areas that require the most emphasis for study and those areas that require only cursory review. Most of the references are texts that are readily available at your nearest library, or that you might already own. When you have completed the review and any necessary additional study, you will be ready to take practice tests

on the CD-Rom.

The CD-Rom is a new feature of this edition. It provides you with an assessment of your readiness in all sections covered by the actual National Certifying Exam in a manner that simulates a computer based environment.

As you may already know, the Certifying Exam integrates subtopics; i.e., the questions are not separated into discrete categories. Thus, you can use the CD-Rom question bank to acclimate yourself to taking this heterogeneous mixture of question topics. You will be able to create any number of random exams, or select specific topics to concentrate your review on in a timed or untimed environment. The CD-Rom will give you practice answering a large number of questions over an extended period of time, thus helping prepare you for the exam day environment. A 75% score should be considered the minimum acceptable score on this test. In addition, if you get less than 75% correct in any of the subject areas, you may want to supplement your studying with the references provided.

The official source of applications for and information about the surgical technology exam can be obtained from the following:

Liaison Council on Certification for the Surgical
Technologist

128 South Tejon Street

Suite 301

Colorado Springs, CO 80903

Telephone: (719) 328-0800

Toll-free: (800) 707-0057

Fax: (719) 328-0801

Website: <http://nbstsa.org>

SECTION I
Fundamental Knowledge

CHAPTER 1

Medical Terminology

Questions

1. Adnexa refers to

- (A) adrenal glands
- (B) sympathetic nerve fibers
- (C) outer most layer
- (D) accessory organs

2. A drop is denoted by the abbreviation

- (A) gt
- (B) g
- (C) cc
- (D) mL

3. The abbreviation ung refers to

- (A) tincture
- (B) ointment
- (C) as directed
- (D) spirits

4. Proximal is a term that indicates a point

- (A) nearer to the body
- (B) farther away from the body
- (C) in the center of the body
- (D) toward the head

5. Adduction means

- (A) movement away from median plane
- (B) movement toward median plane
- (C) movement superiorly
- (D) movement inferiorly

6. A cystocele is

- (A) a herniation of the urinary bladder
- (B) an accumulation of fluid in any sac-like cavity
- (C) a congenital herniation of intra-abdominal viscera through a defect in the abdominal wall
- (D) a dilatation in the spermatic cord

7. Nulli is a prefix that means

- (A) many
- (B) few
- (C) one
- (D) none

8. False is indicated by the prefix

- (A) non
- (B) meso
- (C) pseudo
- (D) exo

9. Tiny red or purple spots on the skin appearing as a result of small hemorrhages within the dermal or submucosal layers are called

- (A) petechia
- (B) peyronies
- (C) purigos
- (D) pityriasis rosea

10. Kerato refers to

- (A) tubular
- (B) round
- (C) horny
- (D) spherical

11. The suffix lysis means

- (A) removal
- (B) activation
- (C) breaking down

(D) adding

12. The left eye is indicated by the letters

(A) OD

(B) OU

(C) OS

(D) LE

13. Tissue death is called

(A) necrosis

(B) necatoriasis

(C) nematodiasis

(D) neoteny

14. The secretion of excessive sweat is also known as

(A) diaphyseal aclasis

(B) hypercalcemic

(C) hypercapnea

(D) diaphoresis

15. A slow pulse is known as

(A) tachycardia

(B) bradycardia

(C) arterial fibrillation

(D) arrhythmia

16. The STSR is scheduled to scrub on a laparoscopic cholecystectomy. This is removal of

(A) gallbladder

(B) liver

(C) bladder

(D) common duct

17. The term hepatomegaly refers to

(A) too many RBCs

(B) renal pelvis

(C) enlarged liver

(D) enlarged spleen

18. A record of a joint is

(A) arthrogram

(B) myelogram

(C) arthrodesis

(D) none of the above

19. Cystitis is inflammation of

(A) ovary

(B) common bile duct

- (C) cystic duct
- (D) bladder

20. Removal of a sample of tissue for a pathological diagnosis is

- (A) lumpectomy
- (B) specimen
- (C) biopsy
- (D) wedge resection

21. The prefix dys refers to

- (A) not respectful
- (B) difficult/bad
- (C) apart
- (D) through

22. The term referring to outside the body is

- (A) fluoroscopy
- (B) retro peritoneum
- (C) extra corporeal
- (D) supra pubic

23. A surgical endoscope that has the ability to morcellate or to fragment tissue is known as

- (A) resectoscope
- (B) ESU
- (C) Ligasure
- (D) Harmonic scalpel

24. The region of the abdomen below the stomach is

- (A) epi pubic
- (B) hypergastric
- (C) hypogastric
- (D) umbilical

25. Bulging of intestinal tissue into the vagina is

- (A) cystocele
- (B) hydrocele
- (C) vaginocoele
- (D) rectocele

26. Surgical removal of the globe and accessory attachments of the eye is referred to as

- (A) evisceration
- (B) Le Fort II
- (C) enucleation
- (D) Le Fort III

27. The term referring to chewing is

- (A) subungal
- (B) mastication
- (C) osculation
- (D) micturation

28. Movement of a body part toward the midline is referred to as

- (A) lateral
- (B) adduction
- (C) abduction
- (D) pronation

29. An incision into an artery is referred to as

- (A) angioplasty
- (B) arteriotomy
- (C) arthrotomy
- (D) cut down

Answers and Explanations

- 1. (D)** Tissues or structures that are adjacent to or near another, related structure. The ovaries and the uterine tubes are adnexa to the uterus (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 2. (A)** The abbreviation gt means a drop, derived from gutta, a Latin word (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 3. (B)** Ung refers to ointment (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 4. (A)** Proximal means nearer to a point of reference or attachment, usually the trunk of the body (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 5. (B)** Movement of a limb toward the axis of the body (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 6. (A)** A cystocele is a herniation or protrusion of the urinary bladder through the wall of the vagina

(Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

- 7. (D)** Nulli means none. A woman who has never been pregnant is nulligravida. A woman who has not given birth to a viable infant is nullipara. The designation “para 0” indicates nulliparity (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 8. (C)** The prefix pseudo means false, as in pseudoarthrosis (false joint) or pseudocyesis (false pregnancy) (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 9. (A)** Petechia are a result of tiny hemorrhages, and they range from pinpoint to pinhead size and are flush with the skin surface (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 10. (C)** Kera, kerat, and kerato mean horn or also could refer to the cornea of the eye (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 11. (C)** Lysis is a suffix meaning breaking down as in freeing adhesions from tissue, lysis of adhesions (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

- 12. (C)** The letters OS mean left eye, oculus sinister (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 13. (A)** Localized tissue death that occurs in groups of cells in response to disease or injury is necrosis (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 14. (D)** Diaphoresis is the secretion of sweat, especially the profuse secretions associated with an elevated body temperature, physical exertion, exposure to heat, and mental and emotional stress (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 15. (B)** Bradycardia is a pulse rate below 60 (Fuller).
- 16. (A)** A lap chole is the laparoscopic removal of the gallbladder (Rutherford).
- 17. (C)** The term hepatomegaly refers to an enlarged liver. Hepat = liver, megaly = enlarged (Rutherford).
- 18. (A)** A record of a joint is an arthrogram: arth = joint; gram = record (Rutherford).

- 19. (D)** Cystitis refers to infection/inflammation of the urinary bladder (Rutherford).
- 20. (C)** A biopsy is the removal of a sample of tissue for a pathological analysis and diagnosis (Rutherford).
- 21. (B)** The prefix dys refers to difficult or bad (Rutherford).
- 22. (C)** Extra corporeal refers to outside the body (Rutherford).
- 23. (A)** The resectoscope has the ability to morcel-late or fragment tissue (Rutherford).
- 24. (C)** The region of the abdomen below the stomach is the hypogastric area (Rutherford).
- 25. (D)** A rectocele is the bulging of intestinal tissue into the vagina (Rutherford).
- 26. (A)** Evisceration is surgical removal of the globe and accessory attachments of the eye (Fuller).
- 27. (B)** Mastication is the act of chewing (Rutherford).

28. (B) Movement of a body part toward the midline is referred to as adduction (Rutherford).

29. (B) An incision into an artery is referred to as an arteriotomy (Rutherford).

CHAPTER 2

Anatomy and Physiology

Questions

1. Which radiographic procedure has the ability to make images in multiple planes?

- (A) PET
- (B) CT
- (C) MRI
- (D) Ultrasound

2. The absence of a normal body opening, duct, or canal is called

- (A) atrophy
- (B) atrichia
- (C) ataxia
- (D) atresia

3. Epistaxis can be defined as

- (A) gene interaction
- (B) bleeding from the nose
- (C) congenital urethral defect
- (D) extrachromosomal replication

4. Blood gas analysis is called

- (A) BGA
- (B) SAT rate
- (C) ABG
- (D) ABO

5. A ganglion is a

- (A) chemical substance secreted by the ova
- (B) necrotic death of tissue
- (C) missing segment
- (D) collection of nerve endings

6. The lungs are covered in a serous membranous sac called the

- (A) bronchial pleura
- (B) pulmonary pleura
- (C) visceral pleura
- (D) parietal pleura

7. The passageway for foods and liquids into the digestive system, and for air into the respiratory system, is the

- (A) trachea
- (B) larynx

- (C) epiglottis
- (D) pharynx

8. The vocal cords are located in the

- (A) larynx
- (B) pharynx
- (C) windpipe
- (D) trachea

9. The function of the trachea is to

- (A) conduct air into the larynx
- (B) serve as a pathway for food into the esophagus
- (C) serve as a resonating chamber for speech
- (D) conduct air to and from the lungs

10. The nasal cavity is divided into two portions by the

- (A) concha
- (B) septum
- (C) ethmoid
- (D) vomer

11. The bones of the palm of the hand are referred to as

- (A) phalanges
- (B) carpals

- (C) metacarpals
- (D) calcaneus

12. The muscles important in respiration are

- (A) trapezius
- (B) latissimus dorsi
- (C) pectoralis major
- (D) intercostal

13. The thick, fan-shaped muscle that lies on the anterior chest is the

- (A) latissimus dorsi
- (B) serratus anterior
- (C) pectoralis major
- (D) teres major

14. The triangular muscle of the shoulder that abducts the arm is the

- (A) biceps brachii
- (B) deltoid
- (C) triceps brachii
- (D) serratus anterior

15. Which of the abdominal muscles originates at the pubic bone and ends in the ribs?

- (A) rectus abdominis
- (B) transversus abdominis
- (C) external oblique
- (D) internal oblique

16. One of the principal muscles of the pelvic floor is the

- (A) sartorius
- (B) levator ani
- (C) internal oblique
- (D) rectus abdominis

17. The gastrocnemius is the chief muscle of the

- (A) calf of the leg
- (B) stomach
- (C) stomach's greater curvature
- (D) thigh

18. A connective tissue band that holds bones together is called

- (A) cartilage
- (B) tendon
- (C) joint
- (D) ligament

19. The two bones that form the side walls and the roof of the cranium are the

- (A) parietal bones
- (B) frontal bones
- (C) occipital bones
- (D) temporal bones

20. The sternocleidomastoid muscle is located

- (A) along the side of the neck
- (B) above and near the ear
- (C) under the tongue
- (D) in the back of the neck

21. The medial bone of the forearm, which is located on the small-finger side of the hand, is called the

- (A) ulna
- (B) radius
- (C) humerus
- (D) fibula

22. The bone that is shaped like a butterfly and forms the anterior portion of the base of the cranium is the

- (A) temporal
- (B) sphenoid

- (C) ethmoid
- (D) parietal

23. The bone that forms the posterior portion of the skull is the

- (A) parietal
- (B) occipital
- (C) temporal
- (D) frontal

24. The lower jawbone is the

- (A) maxilla
- (B) mandible
- (C) mastoid
- (D) zygoma

25. The bone located in the neck between the mandible and the larynx, which supports the tongue and provides attachment for some of its muscles, is the

- (A) palatine bone
- (B) vomer
- (C) pterygoid hamulus
- (D) hyoid bone

26. The adult vertebral column has

- (A) 33 bones
- (B) 28 bones
- (C) 26 bones
- (D) 32 bones

27. How many cervical vertebrae are there?

- (A) 7
- (B) 12
- (C) 5
- (D) 4

28. The bone in the axial skeleton that does not articulate with any other bone is the

- (A) sternum
- (B) trochlea
- (C) talus
- (D) hyoid

29. The number of pairs of ribs is

- (A) 12
- (B) 10
- (C) 8
- (D) 7

30. A slender, rod-like bone that is located at the base of the neck and runs horizontally is the

- (A) scapula
- (B) shoulder blade
- (C) clavicle
- (D) sternum

31. The nucleus pulposus is the

- (A) cushioning mass within an intervertebral disk
- (B) result of a ruptured disk
- (C) outer layer of fibrocartilage within a disk
- (D) covering of the intervertebral disk

32. The upper, flaring portion of hipbone is the

- (A) ischium
- (B) pubis
- (C) ilium
- (D) femoral head

33. A large opening at the base of the skull through which the spinal cord passes is the

- (A) ossicle
- (B) hypoglossal canal
- (C) foramen ovale

(D) foramen magnum

34. The larger, weight-bearing bone of the lower leg is the

(A) humerus

(B) talus

(C) fibula

(D) tibia

35. The bone that fits into the acetabulum, forming a joint, is the

(A) tibia

(B) femur

(C) fibula

(D) patella

36. Another name for the kneecap is

(A) patella

(B) tibia

(C) fibula

(D) phalange

37. The membranes that line closed cavities within the body are called

(A) mucous membranes

- (B) serous membranes
- (C) fascial membranes
- (D) skeletal membranes

38. The longest bone in the body is the

- (A) femur
- (B) fibula
- (C) tibia
- (D) humerus

39. A rounded protuberance found at a point of articulation with another bone is called a

- (A) trochanter
- (B) trochlea
- (C) tubercle
- (D) condyle

40. An infection of the bone is

- (A) osteoarthritis
- (B) osteomyelitis
- (C) osteoporosis
- (D) osteomalacia

41. The epiphyses are the

- (A) ends of long bones
- (B) shafts of long bones
- (C) bone-forming cells
- (D) marrow-filled cavities within bone

42. Oil glands of the skin are called

- (A) sudoriferous
- (B) ceruminous
- (C) sebaceous
- (D) hypochlorous

43. The periosteum is

- (A) the membrane that covers bone
- (B) the membrane that surrounds a joint
- (C) the covering of the internal and external organs of the body and the lining of vessels
- (D) a fibrous connective tissue sheath

44. A transparent structure that permits the eye to focus rays to form an image on the retina is the

- (A) sclera
- (B) retina
- (C) cornea
- (D) lens

45. The purpose of the iris is to

- (A) regulate the amount of light entering the eye
- (B) protect the iris
- (C) supply the choroid with nourishment
- (D) receive images

46. The structure that is seen from the outside as the colored portion of the eye is the

- (A) cornea
- (B) pupil
- (C) retina
- (D) iris

47. The nerve that carries visual impulses to the brain is the

- (A) ophthalmic nerve
- (B) optic nerve
- (C) oculomotor nerve
- (D) trochlear nerve

48. The white outer layer of the eyeball is the

- (A) conjunctiva
- (B) sclera
- (C) choroid

(D) retina

49. A jelly-like substance in the eye's posterior cavity is called

(A) choroid

(B) palpebra

(C) vitreous humor

(D) aqueous humor

50. The structure that connects the middle ear and the throat, allowing the eardrum to vibrate freely, is the

(A) membranous canal

(B) external auditory canal

(C) eustachian tube

(D) semicircular canal

51. The conjunctiva is the

(A) colored membrane of the eye

(B) covering of the anterior globe except the cornea

(C) gland that secretes tears

(D) membrane lining the socket

52. The number of pairs of spinal nerves is

(A) 12

- (B) 28
- (C) 30
- (D) 31

53. The great sensory nerve of the face and head is the

- (A) trochlear
- (B) oculomotor
- (C) hypoglossal
- (D) trigeminal

54. The cranial nerve that contains special sense fibers for hearing as well as for balance is

- (A) II
- (B) V
- (C) VIII
- (D) XII

55. The part of the brain responsible for maintenance of balance and muscle tone, as well as coordination of voluntary muscle, is the

- (A) cerebellum
- (B) cerebrum
- (C) midbrain
- (D) pons

56. The frontal, temporal, parietal, and occipital lobes are divisions of the

- (A) midbrain
- (B) interbrain
- (C) cerebellum
- (D) cerebrum

57. The area of the brain that controls the respiratory center is the

- (A) cerebellum
- (B) interbrain
- (C) pons
- (D) medulla oblongata

58. The largest part of the brain is the

- (A) brain stem
- (B) cerebrum
- (C) diencephalon
- (D) cerebellum

59. The outermost covering of the brain and spinal cord is the

- (A) pia mater
- (B) dura mater

- (C) arachnoid
- (D) choroid

60. Cerebrospinal fluid circulates freely in the

- (A) subarachnoid space
- (B) arachnoid space
- (C) pia mater
- (D) subdural space

61. The brain contains four fluid-filled spaces called the

- (A) auricles
- (B) ventricles
- (C) fissures
- (D) sulci

62. Which of the following structures transmits sound vibrations to the inner ear?

- (A) External auditory canal
- (B) Tympanic membrane
- (C) Semicircular canal
- (D) Stapes

63. The winding, cone-shaped tube of the inner ear is the

- (A) vestibule

- (B) semicircular canal
- (C) labyrinth
- (D) cochlea

64. Which of the following is not an auditory ossicle?

- (A) Cochlea
- (B) Stapes
- (C) Incus
- (D) Malleus

65. Cross-matching of blood

- (A) determines patient's blood type
- (B) determines Rh factor of both patient and donor
- (C) determines suitability of donor by mixing donor RBCs with recipient serum
- (D) determines blood group of donor

66. The highly specialized blood cell whose function is oxygen transportation is

- (A) red blood cell
- (B) white blood cell
- (C) blood plasma
- (D) fibrinogen

67. A differential count provides an estimate of

- (A) the amount of hemoglobin
- (B) the volume percentage of red cells
- (C) the percentage of each type of white cell
- (D) electrolyte percentages

68. Mixing of incompatible bloods may result in

- (A) agglutination
- (B) infectious hepatitis
- (C) leukocytosis
- (D) hyperglycemia

69. Platelets are essential for

- (A) coagulation of blood
- (B) controlling of infection
- (C) carrying oxygen
- (D) combating histamine effect

70. In a normal adult, the average number of leukocytes per cubic millimeter of circulating blood is

- (A) 1000–4000
- (B) 3000–8000
- (C) 5000–10,000
- (D) 10,000–15,000

71. A large superficial vein in the lower extremity, which begins in the foot and extends up the medial side of the leg, the knee, and the thigh, is called the

- (A) femoral
- (B) greater saphenous
- (C) iliac
- (D) popliteal

72. The vein in the bend of the elbow that is commonly used as a site for venipuncture is the

- (A) subclavian vein
- (B) cephalic vein
- (C) median cubital vein
- (D) basilic vein

73. The artery at the back of the knee is the

- (A) popliteal
- (B) femoral
- (C) iliac
- (D) celiac

74. The superior and inferior mesenteric arteries supply the

- (A) stomach

- (B) intestines
- (C) spleen
- (D) kidney

75. The vein that drains the veins of the chest wall and empties into the superior vena cava is the

- (A) azygos
- (B) hepatic
- (C) cephalic
- (D) basilic

76. The veins of the head and neck are drained by the

- (A) basilic vein
- (B) cephalic veins
- (C) azygos vein
- (D) jugular veins

77. Which arteries supply the heart?

- (A) Pulmonary
- (B) Aortic
- (C) Coronary
- (D) Common carotid

78. The atrioventricular (AV) node causes

- (A) auricular relaxation
- (B) ventricular contraction
- (C) ventricular dilation
- (D) auricular contraction

79. Why would an aspirated foreign body be more likely to enter the right bronchus rather than the left bronchus?

- (A) The right bronchus is more vertical, shorter, and wider than the left
- (B) The division of the right bronchus is wider
- (C) The right bronchus is longer
- (D) The left bronchus is not in line with the trachea

80. The spleen filters

- (A) antibodies
- (B) tissue fluid
- (C) lymph
- (D) blood

81. Circulation that is established through an anastomosis between two vessels supplying or draining two adjacent structures is called

- (A) portal circulation
- (B) collateral circulation

- (C) systemic circulation
- (D) pulmonary circulation

82. Which artery supplies the head and neck?

- (A) Subclavian
- (B) Carotid
- (C) Brachiocephalic
- (D) Aortic arch

83. The serous membrane that covers the heart is the

- (A) pericardium
- (B) myocardium
- (C) epicardium
- (D) endocardium

84. The circle of Willis is located

- (A) in the axillary region
- (B) posterior to the ear
- (C) at the base of the brain
- (D) at the base of the neck

85. The branch of the external iliac artery that is located in the thigh is called the

- (A) tibial artery

- (B) femoral artery
- (C) popliteal artery
- (D) celiac artery

86. The descending aorta terminates at the level of the fourth lumbar vertebra, dividing into

- (A) two saphenous arteries
- (B) two femoral arteries
- (C) internal and external iliac arteries
- (D) two common iliac arteries

87. The contractions of the heart are synchronized and regulated by the pacemaker of the heart, which is called the

- (A) sinoatrial node
- (B) atrioventricular node
- (C) atrioventricular bundle
- (D) Purkinje fibers

88. Tiny blood vessels that permeate and nourish tissue are called

- (A) veins
- (B) venules
- (C) arterioles
- (D) capillaries

89. The wall or partition dividing the heart into right and left sides is called the

- (A) semilunar valve
- (B) mitral valve
- (C) chordae tendineae
- (D) septum

90. The heart valve that closes at the time the right ventricle begins pumping, preventing blood from returning to the right atrium, is the

- (A) aortic semilunar
- (B) pulmonary semilunar
- (C) bicuspid
- (D) tricuspid

91. The inner lining of the heart, composed of smooth, delicate membrane, is called the

- (A) pericardium
- (B) endocardium
- (C) epicardium
- (D) myocardium

92. The spleen is located

- (A) in the left hypochondriac region

- (B) behind the liver
- (C) behind the left kidney
- (D) behind the right kidney

93. All of the following are parts of the lymphatic system EXCEPT the

- (A) thyroid
- (B) tonsils
- (C) spleen
- (D) thymus

94. The S-shaped bend in the lower colon is called the

- (A) hepatic flexure
- (B) splenic flexure
- (C) rectum
- (D) sigmoid

95. The reabsorption of water and electrolytes is the main function of the

- (A) sigmoid colon
- (B) large intestine
- (C) small intestine
- (D) liver

96. The terminal portion of the large intestine is the

- (A) sigmoid
- (B) rectum
- (C) anus
- (D) anal canal

97. Which structure lies retroperitoneally?

- (A) Sigmoid colon
- (B) Spleen
- (C) Liver
- (D) Kidney

98. The first portion of the large intestine is the

- (A) sigmoid
- (B) cecum
- (C) colon
- (D) ileum

99. The appendix is attached to the

- (A) ascending colon
- (B) transverse colon
- (C) cecum
- (D) descending colon

00. The primary function of the gallbladder is

- (A) storage of bile
- (B) production of bile
- (C) digestion of fats
- (D) drainage of the liver

01. When the gallbladder contracts, bile is ejected into the

- (A) liver
- (B) duodenum
- (C) jejunum
- (D) pancreas

02. The area in the duodenum where the common bile duct and the pancreatic duct empty is called

- (A) the duct of Santorini
- (B) the ampulla of Vater
- (C) Wirsung's duct
- (D) the islet of Langerhans

03. Which structure is also known as the “fatty apron”?

- (A) greater omentum
- (B) lesser omentum
- (C) mesentery
- (D) falciform ligament

04. The common bile duct is the union of the

- (A) cystic duct and cystic artery
- (B) cystic duct and hepatic duct
- (C) cystic artery and hepatic duct
- (D) hepatic vein and cystic duct

05. The yellow tinge in the skin symptomatic of obstructive jaundice is caused by the accumulation of what substance in the blood and tissue?

- (A) Cholesterol
- (B) Bile salts
- (C) Enzymes
- (D) Bilirubin

06. The head of the pancreas is located

- (A) in the curve of the duodenum
- (B) by the spleen
- (C) on the undersurface of the liver
- (D) in the curve of the descending colon

07. The sphincter at the junction of the small and large intestines is the

- (A) sphincter of Oddi
- (B) ileocecal sphincter

- (C) pyloric sphincter
- (D) duodenal sphincter

08. The portion of the small intestine that receives secretions from the pancreas and the liver is the

- (A) ileum
- (B) jejunum
- (C) duodenum
- (D) pylorus

09. The region of the stomach that connects to the duodenum is the

- (A) fundus
- (B) body
- (C) pylorus
- (D) cardia

10. The mesentery is

- (A) a double-layered peritoneal structure shaped like a fan
- (B) a word synonymous with “fatty apron”
- (C) the membrane covering the surface of most abdominal organs
- (D) a structure that supports the sigmoid colon

11. The large central portion of the stomach is called the

- (A) pylorus
- (B) body
- (C) fundus
- (D) cardia

12. The muscle serving as a valve to prevent regurgitation of food from the intestine back into the stomach is known as the

- (A) sphincter of Oddi
- (B) ileocecal sphincter
- (C) cardiac sphincter
- (D) pyloric sphincter

13. The digestive passageway that begins at the pharynx and terminates in the stomach is the

- (A) larynx
- (B) trachea
- (C) windpipe
- (D) esophagus

14. The point at which the esophagus penetrates the diaphragm is called the

- (A) hiatus

- (B) meatus
- (C) sphincter
- (D) fundus

15. Adenoids are also called

- (A) palatine tonsils
- (B) pharyngeal tonsils
- (C) lingual tonsils
- (D) uvula

16. The function of the molar teeth is to

- (A) tear and crush food
- (B) crush and grind food
- (C) cut food
- (D) manipulate food

17. Mumps occur in the

- (A) sublingual glands
- (B) submandibular glands
- (C) parotid glands
- (D) thyroid gland

18. The salivary glands located under the tongue are the

- (A) sublingual

- (B) sublingual
- (C) submaxillary
- (D) parotid

19. The liver has

- (A) two lobes
- (B) three lobes
- (C) four lobes
- (D) five lobes

20. The glomerulus is a

- (A) tiny coiled tube
- (B) tube-like extension into the renal pelvis
- (C) double-walled cup
- (D) cluster of capillaries

21. The tubes or cup-like extensions that project from the renal pelvis are called

- (A) glomeruli
- (B) convoluted tubules
- (C) Bowman's capsules
- (D) calyces

22. Urine is transported along the ureters to the bladder by

- (A) gravity flow
- (B) contraction of the renal pelvis
- (C) peristaltic waves
- (D) muscle relaxation

23. The smooth, triangular area at the bottom of the bladder that contains three openings is called the

- (A) internal sphincter
- (B) urinary meatus
- (C) trigone
- (D) external os

24. The kidneys are positioned

- (A) intraperitoneally
- (B) retroperitoneally
- (C) in front of the parietal peritoneum
- (D) in back of the visceral peritoneum

25. The kidney structure that filters blood, returns useful substances to blood, and removes substances from blood that are not needed is the

- (A) nephron
- (B) glomerulus
- (C) medulla
- (D) cortex

26. Blood is supplied to the kidney by means of the renal artery, which arises from the

- (A) thoracic aorta
- (B) aortic arch
- (C) abdominal aorta
- (D) pulmonary artery

27. The indentation in the kidney through which all structures must pass as they enter or leave the kidney is the

- (A) hilus
- (B) renal pelvis
- (C) renal capsule
- (D) cortex

28. The outer layer of the kidney is known as the

- (A) medulla
- (B) glomerulus
- (C) nephron
- (D) cortex

29. The portion of the male urethra that passes through the pelvic floor is called the

- (A) prostatic portion

- (B) cavernous portion
- (C) membranous portion
- (D) penile portion

30. A lack of voluntary control over micturition is called

- (A) retention
- (B) urination
- (C) incontinence
- (D) suppression

31. Urine empties from the bladder through a tube called the

- (A) urethra
- (B) urinary meatus
- (C) urethral meatus
- (D) external urethral sphincter

32. Fertilization occurs in the

- (A) fallopian tubes
- (B) uterus
- (C) ovary
- (D) gonads

33. The perineum is

- (A) a thin tissue stretching across the vagina
- (B) the region anterior to the clitoris
- (C) the lower portion of the uterus
- (D) the area between the vagina and the anus

34. The small, sensitive structure of the female homologous to the male penis is the

- (A) hymen
- (B) clitoris
- (C) perineum
- (D) vestibule

35. Ova are swept into the fallopian tubes by small, fringe-like extensions on the distal ends of the tubes called

- (A) ostium
- (B) fimbriae
- (C) oviducts
- (D) stroma

36. The inner lining of the uterus is called the

- (A) endometrium
- (B) serosa
- (C) myometrium
- (D) oocyte

37. The ligament that attaches the ovaries to the pelvic wall is the

- (A) mesovarian
- (B) ovarian
- (C) suspensory
- (D) broad

38. The supporting structure of the male reproductive system is the

- (A) inguinal canal
- (B) cremaster muscle
- (C) vas deferens
- (D) spermatic cord

39. The loose skin covering the glans penis like a sheath is called the

- (A) crura
- (B) prepuce
- (C) bulb
- (D) tunica albuginea

40. The distal end of the penis is slightly enlarged and is called the

- (A) glans penis

- (B) prepuce
- (C) foreskin
- (D) corpora cavernosa penis

41. In a male, the structure surrounding the entrance to the urethra just below the urinary bladder is

- (A) Cowper's gland
- (B) the prostate gland
- (C) the bulbourethral gland
- (D) the seminal vesicle

42. Which structure is not a portion of the male urethra?

- (A) Membranous
- (B) Prostatic
- (C) Vas
- (D) Penile

43. This structure stores sperm and propels them toward the urethra during ejaculation

- (A) vas deferens
- (B) ejaculatory duct
- (C) spermatic cord
- (D) epididymis

44. The long, coiled tube in which sperm mature is the

- (A) vas deferens
- (B) epididymis
- (C) ejaculatory duct
- (D) seminal vesicle

Answers and Explanations

- 1. (C)** The MRI (magnetic resonance imaging) uses radio frequency radiation as its source of energy. It affords superior soft tissue contrast, has the ability to image in multiple planes, and lacks ionizing radiation hazards. The CT scan produces a detailed cross-section of tissue structure. A PET (positron emission tomography) scan examines the metabolic activity of various body structures in color-coded images. The ultrasound images deep structures by measuring and recording sound waves (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 2. (D)** Atresia is the absence of a normal body opening, duct, or canal, such as the anus, vagina, external ear canal, or biliary structure (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 3. (B)** Epistaxis is bleeding from the nose caused by local irritation of mucous membranes, violent sneezing, and a variety of other reasons. Also known as nose bleed (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

- 4. (C)** Arterial blood gas (ABG) assesses the oxygen and carbon dioxide in arterial blood, measured by various methods to assess the adequacy of ventilation and oxygenation and the acid–base status (Mosby’s Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 5. (D)** A knot or knot-like mass; nerve cell bodies collected in groups (Mosby’s Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 6. (C)** Each lung is enveloped in a sac of serous membrane called the pleura. The chest cavity is lined with the parietal pleura. The lung covering is called the visceral pleura (Tortora and Grabowski).
- 7. (D)** The muscular pharynx serves as a passageway for food and liquids into the digestive tract. It is also the path for air into the respiratory system. The throat runs from the nares and runs partway down the neck, where it opens into the esophagus (posterior) and the larynx (anterior) (Tortora and Grabowski).
- 8. (A)** The vocal cords lie in the upper end of the larynx. They are responsible for voice production (Tortora and Grabowski).
- 9. (D)** The windpipe, or trachea, conducts air to and from

the lungs. It is a tubular passageway located anterior to the esophagus. It further divides into the right and left bronchi (Tortora and Grabowski).

10. (B) The nasal cavity is a hollow behind the nose. It is divided into right and left portions by the nasal septum. The anterior septum is made of cartilage (Tortora and Grabowski).

11. (C) The metacarpal bones form the palm of the hand. There are five on each side. The heads of the metacarpal are commonly called the knuckles (Tortora and Grabowski).

12. (D) The intercostal muscles are inserted in the spaces between the ribs. These are particularly important in respiration. They serve to enlarge the thoracic cavity upon inspiration (Tortora and Grabowski).

13. (C) The pectoralis major is a thick, fan-shaped muscle located in the upper chest. Its fibers extend from the center of the thorax through the armpits to the humerus (Tortora and Grabowski).

14. (B) The deltoid is a thick, triangular muscle that covers the shoulder joint. It is responsible for the

roundness of the shoulder. It acts to abduct the arm (Tortora and Grabowski).

15. (A) On the anterior portion of the abdominal wall, the rectus abdominis forms a strap-like mass of muscle. It runs from the pubic bone at the floor of the abdominal cavity straight up to the xiphoid process of the sternum and the lower margins of the rib cage (Tortora and Grabowski).

16. (B) The pelvic floor, or perineum, has its own form of diaphragm, shaped somewhat like a shallow dish. One of the principal muscles of this pelvic diaphragm is the levator ani, which acts on the rectum and aids in defecation (Tortora and Grabowski).

17. (A) The gastrocnemius is the chief muscle of the calf of the leg. It is a large muscle on the posterior part of the leg. It extends the foot and helps to flex the knee upon the thigh (Tortora and Grabowski).

18. (D) A ligament is a band or sheet of strong fibrous tissue connecting the articular ends of bones. It serves to bind them together and facilitate or limit motion. It is a cord-like structure (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

- 19. (A)** One parietal bone is located on each side of the skull just posterior to the frontal bone. They form the bulging sides and the roof of the cranium (Tortora and Grabowski).
- 20. (A)** The sternocleidomastoid muscle extends along the side of the neck. It is sometimes referred to as the sternomastoid. It arises from the sternum and the inner part of the clavicle (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 21. (A)** The forearm is the ulna. It is on the same side as the little finger. On the proximal end is the olecranon process, which forms the prominence of the elbow (Tortora and Grabowski).
- 22. (B)** The sphenoid bone is a large wedge-shaped bone at the base of the skull. It lies between the occipital and ethmoid in the front, and between the parietal and temporal bones on the side (Tortora and Grabowski).
- 23. (B)** The occipital bone forms the posterior part and a good portion of the base of the cranium. It is the bone in the lower part of the skull between the parietal and the temporal bones (Tortora and Grabowski).

- 24. (B)** The mandible is the lower jawbone. It is the only movable bone in the skull. It is horseshoe shaped (Tortora and Grabowski).
- 25. (D)** The hyoid bone is located in the neck between the mandible and the larynx. It supports the tongue and provides an attachment for its muscles. It does not articulate with any other bone (Tortora and Grabowski).
- 26. (C)** In an infant there are 33 separate bones in the vertebral column. Five of these bones eventually fuse to form the sacrum, and four others join to become the coccyx. As a result, an adult vertebral column has 26 parts (Tortora and Grabowski).
- 27. (A)** There are 7 cervical vertebrae in the neck, 12 thoracic vertebrae, and 5 lumbar vertebrae (lower back) (Tortora and Grabowski).
- 28. (D)** The single hyoid bone does not articulate with any other bone. It supports the tongue providing attachment sites for muscles of the tongue, neck and pharynx (Tortora and Grabowski).
- 29. (A)** Regardless of age, each person usually has 12

pairs of ribs, one pair attached to each of the 12 thoracic vertebrae. Each rib articulates posteriorly with its corresponding thoracic vertebrae (Tortora and Grabowski).

- 30. (C)** The clavicles are slender, rod-like bones with elongated “S” shapes. They are located at the base of the neck and run horizontally between the sternum and the shoulders. Another name is collarbone (Tortora and Grabowski).
- 31. (A)** Each disk is composed of a tough outer layer of fibrocartilage (annulus fibrosus) and an elastic central mass (nucleus pulposus). This structure is soft and pulpy (Tortora and Grabowski).
- 32. (C)** The upper, flaring portion or prominence of the hipbone is the ilium. Its superior border is the iliac crest. The internal surface is the iliac fossa (Tortora and Grabowski).
- 33. (D)** The foramen magnum is a large hole in the inferior part of the bone (occipital) through which the medulla oblongata and its membranes, the accessory nerve (XI), and the vertebral and spinal arteries pass (Tortora and Grabowski).

- 34. (D)** The tibia is the larger medial bone of the lower leg. It bears the major portion of the weight on the leg. Another name is shinbone (Tortora and Grabowski).
- 35. (B)** The head of the femur fits into a lateral depression in the os coxae (the acetabulum), forming a joint. It is held in place by a ligament and by a tough fibrous capsule surrounding the joint (Tortora and Grabowski).
- 36. (A)** The patella, or kneecap, is a small, triangular bone anterior to the knee joint. It is a lens-shaped sesamoid bone situated in front of the knee in the tendon of the quadriceps femoris muscle (Tortora and Grabowski).
- 37. (B)** There are two categories of membranes: epithelial and connective tissue. The epithelial is further divided into the mucous membrane, which lines tubes and other spaces that open to the outside of the body, and the serous membrane, which lines closed cavities within the body (Tortora and Grabowski).
- 38. (A)** Long bones consist of a rod-like shaft with knob-like ends. The longest bone in the body is the femur. Another name is the thighbone (Tortora and Grabowski).

- 39. (D)** A condyle is a rounded protuberance found at the point of articulation with another bone. The distal end of the femur has large condyles. These condyles articulate with the tibia at the knee joint (Tortora and Grabowski).
- 40. (B)** Osteomyelitis is an infection of bone caused by bacteria that may reach the bone from outside the body, from other sites of infection, and from adjacent structures (Tortora and Grabowski).
- 41. (A)** The ends of long bones are called epiphyses. They have a somewhat bulbous shape, which provides roomy areas for muscle attachments and gives stability to the joints (Tortora and Grabowski).
- 42. (C)** Several kinds of exocrine glands are associated with the skin: sebaceous (oil) glands, sudoriferous (sweat) glands, ceruminous glands, and mammary glands (Tortora and Grabowski).
- 43. (A)** The periosteum is a fibrous vascular membrane covering bones, except at the extremities (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

- 44. (D)** The lens is a transparent, colorless structure in the eye that is biconvex in shape. It is enclosed in a capsule. It is capable of focusing rays so that they form a perfect image on the retina (Tortora and Grabowski).
- 45. (A)** The purpose of the iris is to regulate the amount of light entering the eye. The pupil is the contractile opening in the center of the eye (Tortora and Grabowski).
- 46. (D)** The iris is a thin, muscular diaphragm that is seen from the outside as the colored portion of the eye (Tortora and Grabowski).
- 47. (B)** The optic nerve carries visual impulses received by the rods and cones in the retina to the brain. This is the second cranial nerve (Tortora and Grabowski).
- 48. (B)** The eyeball has three separate coats or tunics. The outermost layer is called the sclera and is made of firm, tough connective tissue. It is known as the white of the eye (Tortora and Grabowski).
- 49. (C)** Aqueous humor is a watery, transparent fluid found in the anterior and posterior chambers of the

eye. It helps maintain the eye's conical shape and assists in focusing light rays. The posterior cavity lies between the lens and the retina and contains a jelly-like substance called vitreous humor, which helps prevent the eyeball from collapsing (Tortora and Grabowski).

50. (C) Normally the air pressure on the two sides of the eardrum is equalized by means of the eustachian tube. This connects the middle ear cavity and the throat. This allows the eardrum to vibrate freely with the incoming sound waves (Tortora and Grabowski).

51. (B) Conjunctiva is the mucous membrane that lines the eyelids and covers the anterior surface of the globe, except for the cornea. It is reflected onto the eyeball (Tortora and Grabowski).

52. (D) There are 31 pairs of spinal nerves. Each nerve is attached to the spinal cord by two roots, the dorsal root and the ventral root. By pairs there are 8 cervical, 12 thoracic, 5 lumbar, 5 sacral, and 1 coccygeal (Tortora and Grabowski).

53. (D) The trigeminal nerve is the great sensory nerve of the face and head. It has three branches that carry

general sense impulses. The third branch is joined by motor fibers to the muscles of chewing (mastication) (Tortora and Grabowski).

- 54. (C)** The acoustic nerve, VIII, contains special sense fibers for hearing as well as balance from the semicircular canal of the internal ear. It is also called the vestibulocochlear (Tortora and Grabowski).
- 55. (A)** The cerebellum aids in coordinating the voluntary muscles, helps maintain balance in standing, walking, and sitting, and aids in maintaining muscle tone (Tortora and Grabowski).
- 56. (D)** The lobes of the cerebral hemispheres are named after the skull bones that they underlie. They are the frontal, parietal, temporal, and occipital lobes (Tortora and Grabowski).
- 57. (D)** Within the medulla are three vital reflex centers of the reticular system. The cardiac center regulates heartbeat, the respiratory center adjusts the rate and depth of breathing, and the vasoconstrictor center regulates the diameter of the blood vessels (Tortora and Grabowski).

- 58. (B)** The largest part of the brain is the cerebrum, which is divided into the two cerebral hemispheres (a right and a left side). It is supported by the brain stem (Tortora and Grabowski).
- 59. (B)** The meninges are three layers of connective tissue that surround the brain and the spinal cord to form a complete enclosure. The outermost layer of these membranes is called the dura mater. The second layer around the brain and spinal cord is the arachnoid membrane. The third layer is the pia mater (Tortora and Grabowski).
- 60. (A)** Between the arachnoid and the pia mater is the subarachnoid space. This is where the cerebral fluid circulates (Tortora and Grabowski).
- 61. (B)** Within the brain are four fluid-filled spaces called the ventricles. They are cavities that communicate with each other, with the central canal of the spinal cord, and with the subarachnoid space (Tortora and Grabowski).
- 62. (B)** The tympanic membrane (eardrum) transmits sound vibrations to the internal ear by means of the auditory ossicles (Mosby's Medical, Nursing, and

Allied Health Dictionary, 5th ed.).

- 63. (D)** The cochlea looks like a small spiral-shaped shell. It is a tube coiled for about two and a half turns into a spiral, around a central axis of the bone (Tortora and Grabowski).
- 64. (A)** Expanding across the middle ear area are three exceedingly small bones called the auditory ossicles: the malleus, the incus, and the stapes (Tortora and Grabowski).
- 65. (C)** In a cross-match of blood, the donor RBCs are mixed with the recipient's serum. If agglutination does not occur, the recipient does not have antibodies that will attack the donor RBCs. If no agglutination (clumping) occurs, the donor's blood may be safely transfused to the recipient providing all the other criteria have been met (Tortora and Grabowski).
- 66. (A)** Red blood cells contain oxygen-carrying protein hemoglobin. They are called RBCs or erythrocytes (Tortora and Grabowski).
- 67. (C)** The differential white count (an estimate of the percentage of each type of white cell) is done using a

stained blood slide. Some blood diseases and inflammatory conditions can be recognized this way (Tortora and Grabowski).

- 68. (A)** Incompatibility of blood transfusions may be attributable to either the plasma or red cells of the donor's blood. The red cells of the donor's blood may become clumped or held together in bunches. This process is called agglutination (Tortora and Grabowski).
- 69. (A)** Platelets are formed by the red bone marrow and are essential for the coagulation of blood and in maintenance of hemostasis (Tortora and Grabowski).
- 70. (C)** A normal adult has an average of 5,000 to 10,000 leukocytes per cubic millimeter of circulating blood, or about 1 leukocyte to 700 erythrocytes. A high white blood count is indicative of infection (Tortora and Grabowski).
- 71. (B)** The saphenous vein is the longest vein in the body. The greater saphenous vein, which is superficial, extends up the medial side of the leg, the knee, and the thigh. At the groin, it empties into the femoral vein (Tortora and Grabowski).

- 72. (C)** In the bend of the elbow, the median cubital vein ascends from the cephalic vein on the lateral side of the arm to the basilic vein on the medial side. It is the preferred vein for venipuncture (Tortora and Grabowski).
- 73. (A)** The external iliac artery changes to the femoral in the thigh. This vessel branches off in the thigh and then becomes the popliteal artery at the back of the knee joint. It subdivides below the knee. The popliteal vein is also behind the knee (Tortora and Grabowski).
- 74. (B)** The superior mesenteric artery, which is the largest branch of the abdominal aorta, carries blood to most of the small intestine as well as to the first half of the large intestine. The much smaller inferior mesenteric artery, which is located near the end of the abdominal aorta, supplies the major part of the large intestine and the rectum (Tortora and Grabowski).
- 75. (A)** The azygos vein drains the veins of the thorax and empties into the superior vena cava just before the latter empties into the heart. It also may serve as a bypass for the inferior vena cava that drains blood from the lower body (Tortora and Grabowski).

- 76. (D)** Blood from the face, scalp, and superficial regions of the neck is drained by the internal and external jugular vein. The internal jugulars flow into the superior vena cava. The external jugulars flow into the subclavian veins (Tortora and Grabowski).
- 77. (C)** Blood is supplied to the heart by the right and left coronary arteries. Branches of these two arteries encircle the heart and supply all the parts of the myocardium. Branches lead to the atrial and ventricular myocardium (Tortora and Grabowski).
- 78. (B)** Impulses that start at the sinoatrial node spread through the atrial muscle fibers, producing atrial contractions. When the impulses reach the AV node they are relayed to the ventricles via the bundle of His and the Purkinje fibers, producing synchronized contraction of the ventricles (Tortora and Grabowski).
- 79. (A)** The right primary bronchus is more vertical, shorter, and wider than the left. As a result, foreign objects in the air passageways are more likely to enter it than the left and frequently lodge in it (Tortora and Grabowski).
- 80. (D)** The spleen is an organ containing lymphoid tissue

designed to filter blood. It is frequently damaged in abdominal trauma, causing it to rupture. This causes severe hemorrhage, which requires prompt splenectomy (Tortora and Grabowski).

- 81. (B)** Most parts of the body receive branches from more than one artery. The junction of two or more vessels supplying the same body region is an anastomosis. Anastomosis between arteries provides alternate routes for the blood. If a vessel becomes occluded, circulation is taken over by the alternate route; this is known as collateral circulation (Tortora and Grabowski).
- 82. (B)** The left and right carotid arteries supply the head and neck. The external carotid supplies the right side of the thyroid, tongue, throat, face, ear, scalp, and the dura mater (Tortora and Grabowski).
- 83. (A)** Pericardium forms the outermost layer of the heart wall. It also lines the pericardial sac. It is a loose-fitting membrane. Pericarditis is an inflammation of the lining (Tortora and Grabowski).
- 84. (C)** The posterior cerebral arteries help to form an arterial circle at the base of the brain called the circle

of Willis, which creates a connection between the vertebral artery and internal carotid artery systems. It equalizes blood pressure to the brain and provides alternate routes for blood to the brain (Tortora and Grabowski).

85. (B) The external iliac arteries continue into the thigh, where the name of these tubes is changed to femoral. Both femorals go to the genitals and abdominal wall. Other branches run to the thigh and become the popliteal (back of the knee) (Tortora and Grabowski).

86. (D) The descending aorta travels through the thorax, branching off to supply the thoracic organs and structure. It then passes through the diaphragm into the abdomen, supplying the abdominal organs via numerous branches. It terminates at the level of the fourth vertebra, dividing into the two common iliac arteries, which supply the pelvis and lower extremities (Tortora and Grabowski).

87. (A) The contractions of the heart are synchronized, and their rate is controlled by specially modified muscular tissue. The sinoatrial node, the pacemaker, is found in the right atrial wall near the opening of the superior vena cava (Tortora and Grabowski).

- 88. (D)** The arterioles lead into a vast network of very fine blood vessels, the capillaries. These are the blood vessels that permeate the tissues and service the body cells directly. They play a key role in regulating blood flow from arteries to capillaries (Tortora and Grabowski).
- 89. (D)** The human heart is a double pump. The two sides are completely separated from each other by a partition called the septum (Tortora and Grabowski).
- 90. (D)** The tricuspid valve (right atrioventricular) closes at the time the right ventricle begins pumping in order to prevent blood from going back into the right atrium. It has three flaps or cusps and is between the right atrium and the right ventricle (Tortora and Grabowski).
- 91. (B)** The endocardium, which lines the inner surface of the heart cavity, is a thin, delicate membrane composed of endothelial cells. It covers the valves, surrounds the chordae tendineae, and is continuous with the lining membrane of the large blood vessels (Tortora and Grabowski).
- 92. (A)** The spleen is located in the upper left

hypochondriac region of the abdomen and is normally protected by the rib cage. It is between the fundus of the stomach and the diaphragm (Tortora and Grabowski).

93. (A) Lymph, lymph vessels, lymph nodes, tonsils, the thymus, and the spleen make up the lymphatic system. Its function is to drain protein-containing fluid that escapes from the blood capillaries from the tissue spaces. It also transports fats from the digestive tract to the blood (Tortora and Grabowski).

94. (D) The S-shaped bend where the colon crosses the brim of the pelvis and enters the pelvic cavity (where it becomes the rectum) is the sigmoid colon. It begins at the left iliac crest, projects toward the midline, and terminates at the rectum (Tortora and Grabowski).

95. (B) The large intestine has little or no digestive function. It serves to absorb water and electrolytes. It also forms and stores feces until defecation occurs (Tortora and Grabowski).

96. (D) The narrow, distal part of the large intestine is called the anal canal. The rectum is the last 8 inches of the gastrointestinal tract. The terminal 2 inches is the

anal canal (Tortora and Grabowski).

- 97. (D)** Some organs lie on the posterior abdominal wall and are covered by peritoneum on the anterior surface only. Such organs, including the kidney and pancreas, are said to be retroperitoneal (Tortora and Grabowski).
- 98. (B)** The beginning (proximal) portion of the large intestine is the cecum. It hangs below the ileocecal valve. It is a blind pouch 2.5 inches long (Tortora and Grabowski).
- 99. (C)** To the cecum is attached a small blind tube known as the appendix. It is a twisted, coiled tube, 3 inches in length (Tortora and Grabowski).
- 00. (A)** The gallbladder stores bile between meals and releases it when stimulated by gastric juice, fatty foods, and the hormone cholecystokinin. Bile is produced in the liver. The gallbladder stores and concentrates bile (Tortora and Grabowski).
- 01. (B)** When the gallbladder contracts, it ejects concentrated bile into the duodenum. Bile is forced into the common bile duct when it is needed (Tortora

and Grabowski).

- 02. (B)** Pancreatic juice leaves the pancreas through the pancreatic duct, the duct of Wirsung. The pancreatic duct unites with the common bile duct from the liver and gallbladder and enters the duodenum in a small raised area called the ampulla of Vater (Tortora and Grabowski).
- 03. (A)** The greater omentum is the largest peritoneal fold and hangs loosely like a “fatty apron” over the transverse colon and coils of the small intestine (Tortora and Grabowski).
- 04. (B)** The hepatic duct joins the slender cystic duct from the gallbladder to form the common bile duct. The common bile duct and the pancreatic duct enter the duodenum in a common duct, the hepatopancreatic (Tortora and Grabowski).
- 05. (D)** The bile pigments, bilirubin and biliverdin, are products of red blood cell breakdown and are normally excreted in bile. If their excretion is prevented, they accumulate in the blood and tissues, causing a yellowish tinge to the skin and other tissues. This condition is called obstructive jaundice (Tortora and

Grabowski).

- 06. (A)** The pancreas is an oblong, fish-shaped gland that consists of a head, tail, and body. The head rests in the curve of the duodenum, and its tail touches the spleen. It is linked to the small intestine by a series of ducts (Tortora and Grabowski).
- 07. (B)** The ileocecal sphincter or valve joins the large intestine to the small intestine (Tortora and Grabowski).
- 08. (C)** The duodenum receives secretions from the pancreas and the liver. The duodenum originates at the pyloric sphincter and extends 10 inches, where it merges with the jejunum (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.; Tortora and Grabowski).
- 09. (C)** The pylorus is the region of the stomach that connects to the duodenum (Tortora and Grabowski).
- 10. (A)** A broad fan-shaped fold of peritoneum suspending the jejunum and the ileum from the dorsal wall of the abdomen is the mesentery (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th

ed.).

- 11. (B)** The stomach has four main regions: the cardia, fundus body, and pylorus. The large central portion is the body (Tortora and Grabowski).
- 12. (D)** At the end of the pyloric canal, the muscular wall is thickened, forming a circular muscle called the pyloric sphincter. Pyloric stenosis is a narrowing of the pyloric sphincter, which prevents food from passing through (Tortora and Grabowski).
- 13. (D)** The esophagus is a straight, collapsible tube about 10 inches long. It lies behind the trachea. It pierces the diaphragm at the esophageal hiatus (Tortora and Grabowski).
- 14. (A)** The esophagus penetrates the diaphragm through an opening, the esophageal hiatus, which then empties into the stomach (Tortora and Grabowski).
- 15. (B)** Adenoids are also known as pharyngeal tonsils. They have a glandular appearance, particularly lymphoidlike (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

- 16. (B)** The molar's job is to crush and grind food (Tortora and Grabowski).
- 17. (C)** Mumps typically attack the parotid glands. It is an inflammation and enlargement (swelling) (Tortora and Grabowski).
- 18. (B)** The sublingual glands are located under the tongue. They open into the floor of the mouth in the oral cavity (Tortora and Grabowski).
- 19. (A)** The liver is the largest gland in the body. It is divided into left and right segments or lobes. It is located under the diaphragm. Bile is one of its chief products (Tortora and Grabowski).
- 20. (D)** The glomerulus is a cluster of capillaries located on one end of the nephron. It is a rounded mass of nerves or blood vessels (Tortora and Grabowski).
- 21. (D)** The ureter expands to form a collecting basin for urine in the renal pelvis. Tube-like extensions project from the renal pelvis into active kidney tissue to increase the area for collection. These are calyces (Tortora and Grabowski).

- 22. (C)** Contractions of the muscular coat of the ureters produce peristaltic waves, which transport urine along the ureters. Peristalsis is the main function of the musculature (Tortora and Grabowski).
- 23. (C)** The smooth, triangular area at the bottom of the bladder is the trigone. The two ureters enter the bladder at the upper corners of the trigone. Urine flows out of the urethra through the internal orifice located at the bottom of the trigone (Tortora and Grabowski).
- 24. (B)** The kidneys are positioned retroperitoneally. This means that they are behind the parietal peritoneum and against the deep back muscles. Other retroperitoneal structures are the ureters and the suprarenal glands (Tortora and Grabowski).
- 25. (A)** Nephrons are the functional unit of the kidney that filters blood, returns useful substances to the blood so they are not lost from the body, and removes substances from the blood that are not needed by the body (Tortora and Grabowski).
- 26. (C)** Blood is supplied to the kidney through the renal artery, which arises from the abdominal aorta. The

renal arteries transport about one-fourth of the total cardiac output to the kidney (Tortora and Grabowski).

- 27. (A)** The hilus is a concave indentation of the medial surface of the kidney through which all structures that enter or leave the kidney pass. These structures are the renal artery, the renal vein, and the renal pelvis (Tortora and Grabowski).
- 28. (D)** The cortex is the outer part or layer of the kidney. The inner layer is the medulla (Tortora and Grabowski).
- 29. (C)** The male urethra passes through the prostate gland (prostatic portion), the pelvic floor (membranous portion), and along the length of the penis (cavernous portion) (Tortora and Grabowski).
- 30. (C)** A lack of voluntary control over micturition (urination); stress incontinence is a leakage of urine from the bladder as a result of a physical stress such as coughing or sneezing (Tortora and Grabowski).
- 31. (A)** Urine empties from the bladder through a tube called the urethra. It emerges at an opening on the exterior surface of the body called the urinary meatus

(Tortora and Grabowski).

- 32. (A)** If an ovum is fertilized by a sperm cell, it most often occurs in the upper third of the uterine tubes. Fertilization may occur at any time up to 24 hours following ovulation. The ovum, whether fertilized or not, descends into the uterus within several days (Tortora and Grabowski).
- 33. (D)** In the female, the area located between the vagina and the anus is the perineum. It is cut during delivery (episiotomy) to prevent rectal tearing and subsequent damage (Tortora and Grabowski).
- 34. (B)** The small protuberance that contains specialized nerve endings sensitive to stimulation is the clitoris. It lies about 1 inch superior to the urethral orifice and is homologous to the male penis (Tortora and Grabowski).
- 35. (B)** There is no direct connection between the ovaries and the fallopian tubes. The ova are swept into the tubes by a current in the peritoneal fluid, produced by small, fringelike projections from the abdominal openings of the tubes. These are known as fimbriae (Tortora and Grabowski).

- 36. (A)** The endometrium is the inner lining, serosa the outer layer, and the myometrium, the middle. Ovaries produce oocytes (incompletely developed ovum) (Tortora and Grabowski).
- 37. (C)** The ovaries are attached to the broad ligament of the uterus by a fold of peritoneum called the mesovarian, anchored to the uterus by the ovarian ligaments, and attached to the pelvic wall by the suspensory ligament (Tortora and Grabowski).
- 38. (D)** The spermatic cord is the supporting structure of the male reproductive system. It consists of veins, arteries, lymphatics, nerves, the vas deferens, and a small band of skeletal muscle called the cremaster muscle (Tortora and Grabowski).
- 39. (B)** A loose fold of skin called the prepuce, or foreskin, begins just behind the glans penis and extends forward as a sheath. In the female, it is formed where the labia minora unite and cover the entire body of the clitoris (Tortora and Grabowski).
- 40. (A)** The distal end of the penis is slightly enlarged and is called the glans, meaning shaped like an acorn. Covering the glans is the foreskin (Tortora and

Grabowski).

- 41. (B)** The prostate gland surrounds the posterior urethra just below the urinary bladder. In older males, it often enlarges, causing interference with the excretion of urine. It is doughnut shaped and about the size of a chestnut (Tortora and Grabowski).

- 42. (C)** The urethra in males is subdivided into three portions: the prostatic, the membranous, and the spongy (penile) urethra (Tortora and Grabowski).

- 43. (A)** The ductus (vas) deferens stores sperm and propels them toward the urethra during ejaculation (Tortora and Grabowski).

- 44. (B)** Sperm mature in the epididymis, where they are stored and propelled toward the urethra during ejaculation (Tortora and Grabowski).

CHAPTER 3

Microbiology

Questions

- 1.** The English surgeon who established the first principles of aseptic technique is

 - (A) Ehrlich
 - (B) Madame Curie
 - (C) Alexander
 - (D) Lister
- 2.** Passage of fluid through a cell membrane is called

 - (A) metosis
 - (B) miosis
 - (C) osmosis
 - (D) symbiosis
- 3.** Oxygen-dependent bacteria are said to be

 - (A) anaerobic
 - (B) bacillic
 - (C) antibiotic
 - (D) aerobic

4. The destruction of bacteria by white cells during the inflammatory process is called

- (A) symbiosis
- (B) mitosis
- (C) lymphocytosis
- (D) phagocytosis

5. Bacteriostatic means

- (A) to inhibit growth of microorganisms
- (B) to destroy microorganisms
- (C) to control microorganisms
- (D) to inactivate microorganisms

6. *Staphylococcus aureus* would most likely be transmitted by

- (A) urine
- (B) feces
- (C) nose and mouth
- (D) sex organs

7. Microbial death occurs when an organism is

- (A) reproducing at a slower rate
- (B) reduced in population
- (C) no longer capable of reproduction

(D) exposed to heat

8. What immune protection is available to the fetus?

- (A) natural active
- (B) natural passive
- (C) active artificial
- (D) passive artificial

9. The clinical syndrome characterized by microbial invasion of the bloodstream is

- (A) superinfection
- (B) septicemia
- (C) cross-infection
- (D) cellulitis

10. The body's first line of defense against the invasion of pathogens is

- (A) the immune response
- (B) skin and mucous membrane linings
- (C) cellular and chemical responses
- (D) phagocytosis

11. Rod-like shaped bacteria are identified microscopically as

- (A) bacilli
- (B) cocci
- (C) spirilla
- (D) spirochetes

12. Herpes simplex is commonly called

- (A) cold sore
- (B) shingles
- (C) smallpox
- (D) chicken pox

13. All of the following descriptors refer to the inflammatory process EXCEPT

- (A) heat
- (B) pain
- (C) vasoconstriction
- (D) edema

14. *Clostridium tetani* causes

- (A) gangrene
- (B) nosocomial infection
- (C) lockjaw
- (D) malaria

15. A laboratory *procedure* useful in classifying bacteria

using a staining procedure is

- (A) Gram stain
- (B) iodine stain
- (C) acid fast stain
- (D) differential stain

16. A fulminating infection arising from necrotic tissue and spreading rapidly is

- (A) rabies
- (B) gas gangrene
- (C) pasteurellosis
- (D) tetanus

17. Which bacteria is commonly found in soil?

- (A) *Clostridium tetani*
- (B) *Trypanosoma brucei*
- (C) *Pediculus vestimenti*
- (D) *Yersinia pestis*

18. A severe allergic reaction possibly resulting in death is called

- (A) arthus reaction
- (B) hypersensibility
- (C) anaphylactic shock

(D) autoimmune disease

19. What organism is responsible for a boil?

- (A) *S aureus*
- (B) *Clostridium perfringens*
- (C) *Escherichia coli*
- (D) *Neisseria*

20. The organism most frequently found in burns is

- (A) *C perfringens*
- (B) *Pseudomonas aeruginosa*
- (C) *Clostridium tetani*
- (D) hemolytic streptococci

21. A bacterial pathogen most frequently invading damaged skin is

- (A) *S aureus*
- (B) *Clostridium tetani*
- (C) *Pseudomonas septica*
- (D) *Candida albicans*

22. Which type of wound would favor the development of gas gangrene?

- (A) moist

- (B) necrotic
- (C) dry
- (D) warm

23. Gas gangrene is caused by

- (A) *Fusobacterium*
- (B) *Clostridium tetani*
- (C) *Pseudomonas aeruginosa*
- (D) *C perfringens*

24. The bacteria highly resistant to sterilization and disinfection is

- (A) spores
- (B) fungus
- (C) Gram-positive
- (D) *Pseudomonas*

25. A bacteria found in the intestinal tract is

- (A) *E coli*
- (B) *Bordetella pertussis*
- (C) *Franciscella tularensis*
- (D) *Neisseria gonorrhoeae*

26. The burn classification that is characterized by a dry, pearly white, or charred-appearing surface is

- (A) first
- (B) second
- (C) third
- (D) fourth

27. Occupational Safety and Health Administration (OSHA) is a governmental regulating agency whose aim is to

- (A) provide guidelines to prevent transmission of blood-borne infections
- (B) execute requirements designed to prevent transmission of blood-borne pathogens in the work environment
- (C) require that communicable diseases be reported to a public health agency
- (D) train employees how to recognize and execute safe practices

28. Inflammation is characterized by pain, redness, heat, swelling, and loss of function. The redness can be attributed to

- (A) serum brought into the area
- (B) constriction of capillaries
- (C) vasodilation bringing more blood to the area
- (D) heat from metabolic reaction

29. Removal of contaminated debris from a wound is called

- (A) decontamination
- (B) debridement
- (C) dehiscence
- (D) desiccation

30. The space caused by separation of wound edges is called

- (A) lag phase
- (B) evisceration
- (C) fibrous scarring
- (D) dead space

31. If tissue is approximated too tightly it can cause

- (A) ischemia
- (B) excessive scar tissue
- (C) keloids
- (D) adhesions

32. Tensile strength of a wound refers to

- (A) the suture strength
- (B) ability of tissue to resist rupture
- (C) wound contraction

(D) tissue approximation

33. The substance that unites with thrombin to form fibrin, the basic structural material of blood clots is

- (A) fibrinogen
- (B) prothrombin
- (C) fibrin
- (D) thrombin

34. A cicatrix is

- (A) an abscess
- (B) a scar
- (C) pus
- (D) a wound

35. Keloids are

- (A) a form of abscess
- (B) an adhered serous membrane
- (C) a raised, thickened scar
- (D) a benign tumor

36. A wound that is infected or one in which there is excessive loss of tissue heals by

- (A) primary intention

- (B) secondary intention
- (C) third intention
- (D) fourth intention

37. A CDC guideline that addresses the care of “sharps” includes all of the following EXCEPT

- (A) needles should always be recapped
- (B) needles should not be bent or broken by hand
- (C) needles should not be removed from disposable syringes
- (D) needles should be discarded in puncture-resistant containers for disposal

38. The type of wound healing that requires debridement is

- (A) first
- (B) second
- (C) third
- (D) fourth

39. To promote healing, a surgical wound must have all of the following requisites EXCEPT

- (A) suture closure of dead space
- (B) drains to remove fluid or air
- (C) a moderately tight dressing

(D) tight sutures to create tension

40. Wound healing that employs a technique allowing the wound to heal from the bottom up is called

(A) interrupted intention

(B) first intention

(C) second intention

(D) third intention

41. Which body fluid is least likely to transmit HIV?

(A) Blood

(B) Semen

(C) Saliva

(D) Spinal fluid

42. A band of scar tissue that binds together two anatomical surfaces that are normally separate from each other is called

(A) keloid

(B) adhesion

(C) cicatrix

(D) dehiscence

43. What bacteria is the common cause for post operative wound infections?

- (A) *S aureus*
- (B) Rickettsiae
- (C) Hemophilus influenza
- (D) Candida

44. What spore is used to test steam under pressure (steam sterilizer)?

- (A) *C perfringens*
- (B) *Bacillus stearothermophilus*
- (C) *Treponema pallidum*
- (D) *S aureus*

45. Hospital-acquired infections are known as

- (A) Antibiotic resistant
- (B) Bacteremia
- (C) Nosocomial
- (D) MRSA

46. MRSA methicillin resistant *S aureus* is a strain of *S aureus* that is resistant to most antibiotics. What is the only drug of choice to treat MRSA at this time?

- (A) Vancomycin
- (B) Penicillin
- (C) Gentamicin

(D) Keflex

47. *E coli* is part of the normal flora of the _____ in humans.

(A) Skin

(B) Hair

(C) Intestinal track

(D) None of the above

48. The type of immunity that is acquired by a vaccination is

(A) naturally acquired active immunity

(B) naturally acquired passive immunity

(C) artificial active acquired immunity

(D) artificial passive acquired immunity

49. What Gram stain turns red at the end of the staining procedure?

(A) Gram-positive

(B) Gram-negative

(C) Acid fast positive

(D) Acid fast negative

50. What living cells are more complex, have nuclei and include protozoa, fungi, green, red and brown algae?

- (A) Eukaryotic
- (B) Facultative
- (C) Prokaryotic
- (D) Passive

51. Universal precautions is a previous policy, it is now called

- (A) recommended precautions
- (B) evidence based practice
- (C) occupational precautions
- (D) standard precautions

52. Asepsis means

- (A) without infection
- (B) destroys bacteria
- (C) clean
- (D) absence of microbes

53. The microbes that reside on the skin and are easily removed are referred to as

- (A) resident
- (B) transient
- (C) aseptic flora
- (D) None of the above

54. What is the classification of a wound that is indicated by a delayed closure?

- (A) Primary intention
- (B) Secondary intention
- (C) Third intention
- (D) Fourth intention

55. Complications of wound closure when the organs protrude through the edges of the wound is

- (A) adhesions
- (B) dehiscence
- (C) evisceration
- (D) hemorrhage

56. Arrange the three phases of wound healing in the correct order: 1. Proliferation, 2. Inflammatory, 3. Remodeling.

- (A) 1, 2, 3
- (B) 3, 2, 1
- (C) 2, 3, 1
- (D) 2, 1, 3

57. All factors increase the surgical patient's risk for infection EXCEPT

- (A) location of surgery
- (B) health of the patient
- (C) length of the procedure
- (D) position of the patient

58. Tissue breakdown at the wound margin is

- (A) adhesion
- (B) hematoma
- (C) debridement
- (D) dehiscence

59. Wound complications include

- (A) hematoma
- (B) seroma
- (C) evisceration
- (D) all of the above

60. A wound is described as _____ when there is a collection of pus around the incision.

- (A) hematoma
- (B) suppurative
- (C) granulation
- (D) dehiscence

Answers and Explanations

- 1. (D)** In 1867, Lister began the age of chemical control of the atmosphere. He used aqueous phenol to disinfect instruments, soak dressings, and spray the air of surgical rooms (Bergquist and Pogolian).
- 2. (C)** Osmosis allows the passage of a solvent, usually water, to pass through the membrane from the region of lower concentration of solute to the region of higher concentration. This tends to equalize the concentration of the two solutions (Tortora, Funke, and Case).
- 3. (D)** The majority of microbes are aerobes. This means they grow and flourish in the presence of oxygen (Tortora, Funke, and Case).
- 4. (D)** Leukocytes known as phagocytes rush to a wound to engulf and destroy the bacteria present. Phagocytosis means “cell eating” (Tortora, Funke, and Case).
- 5. (A)** Agents that destroy or inactivate microorganisms are bacteriocidal. An agent that inhibits the growth of

bacteria is known as a bacterio-static agent (Bergquist and Pogolian).

- 6. (C)** *S aureus* is commonly present on skin and mucous membranes, especially those of the nose and the mouth. It is Gram-positive and is the cause of such suppurative conditions as boils, carbuncles, and internal abscesses (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 7. (C)** Microbial death occurs when an organism, or population of organisms, is no longer capable of reproduction (Bergquist and Pogolian).
- 8. (B)** In passive natural immunity, maternal antibodies cross the placenta. Infants are immune to the same infectious diseases as their mothers for 6–12 months after birth. Breast fed babies receive additional protection from the breast milk (Bergquist and Pogolian).
- 9. (B)** Microorganisms can multiply in the blood. Infection of bacterial origin carried through the bloodstream is referred to as bacteremia or septicemia. Microorganisms invade from a focus of infection in the tissue (Tortora, Funke, and Case).
- 10. (B)** The unbroken skin acts as a mechanical barrier to

pathogens. Only when it is cut, scratched, or burned can pathogens gain entrance. Mucous membranes entrap invaders (Tortora, Funke, and Case).

- 11. (A)** Bacteria generally appear in one of several shapes: bacilli are rod shaped, cocci are spherical, and spirilla and spirochetes are corkscrew shaped (Tortora, Funke, and Case).
- 12. (A)** Herpes simplex, commonly called “cold sores” or fever blisters, is an example of a viral agent capable of latent periods where the virus is not multiplied. It remains intact until stress encourages growth. Its appearance is associated with trauma, sun, hormonal changes, and emotional upset (Tortora, Funke, and Case).
- 13. (C)** Local irritation causes the small blood vessels to dilate and become more permeable. The tissue spaces become engorged with fluid, and edema results. In inflammation there is pain, redness, heat, swelling, vasodilation, and disturbance of function (Tortora, Funke, and Case).
- 14. (A)** *Clostridium tetani* is the causative organism of tetany, or lockjaw. Commonly found in soil contaminated with animal fecal waste. Protection is provided by receiving tetanus toxoid to stimulate

antibodies against tetanus toxins. A booster may be given when a dangerous wound is received (Tortora, Funke, and Case).

15. (A) The Gram stain is very useful because it classifies bacteria into two large groups: Gram-positive and Gram-negative. This provides valuable treatment options. Gram-positive bacteria tend to be killed easily by penicillins and cephalosporins. Gram-negative bacteria are generally more resistant (Tortora, Funke, and Case).

16. (B) When the organisms of gas gangrene are introduced into tissues where conditions permit anaerobic multiplication, they utilize amino acids and carbohydrates freed from dead or dying cells (Tortora, Funke, and Case).

17. (C) *Clostridium tetani* is found in soil contaminated with fecal animal waste. Improperly cleaned deep puncture wounds provide the anaerobic condition necessary for its growth. DPT immunization (which includes tetanus toxoid) is a standard immunization. A booster of toxoid may be given when a dangerous wound is received (Tortora, Funke, and Case).

- 18. (C)** Anaphylactic shock is the state of collapse resulting from injection of a substance to which one has been sensitized. It is a severe allergic reaction. Death may occur if emergency treatment is not given (Tortora, Funke, and Case).
- 19. (A)** *S aureus* is associated with skin infections such as boils, carbuncles, furuncles, and impetigo (Tortora, Funke, and Case).
- 20. (B)** *Pseudomonas aeruginosa* most frequently found in burns, presents very difficult problems because the organism is generally resistant to many clinically useful antibiotics (Tortora, Funke, and Case).
- 21. (A)** *S aureus* produces furuncles, carbuncles, and impetigo. One of the most important skin invaders, it produces tissue destruction and abscesses if it escapes localization (Tortora, Funke, and Case).
- 22. (B)** A wound with a poor blood supply (ischemia) can lead to necrosis (death of tissue). The death of soft tissue caused by loss of blood supply is gangrene. Gas gangrene caused by *C perfringens* develops with ischemia and necrosis (Tortora, Funke, and Case).

- 23. (D)** Gas gangrene is caused by the microorganism *C perfringens* (Tortora, Funke, and Case).
- 24. (A)** The most resistant form of microbial life is the endospore. Spores have a thick wall making them difficult to destroy. This enables them to withstand unfavorable conditions such as heat. They require a prolonged exposure time to high temperatures to destroy them (Tortora, Funke, and Case).
- 25. (A)** *E coli* is by far the best known enteric bacterium and is found in the intestinal tract of animals and humans (Bergquist and Pogolian).
- 26. (C)** A third-degree burn includes the skin with all its epithelial structures and subcutaneous tissue destroyed. It is characterized by a dry, pearly white, or charred-appearing surface void of sensation. The destroyed skin forms a parchmentlike eschar over the burned area (Fortunato).
- 27. (B)** In 1991, OSHA adopted requirements designed to prevent transmission of blood-borne pathogens in the work environment. It can fine health care facilities for noncompliance with regulations (Bergquist and Pogolian).

- 28. (C)** The inflammatory response is the body's attempt to neutralize and destroy toxic agents at the site of injury and prevent their spread. After injury, the metabolic rate increases, quickening heartbeat. More blood circulates to the area, causing dilation of vessels. The large amount of blood in the area is responsible for redness (Fortunato).
- 29. (B)** After debris and infected or contaminated tissue is removed by debridement, the wound is irrigated thoroughly. Devitalized tissue is removed because it acts as a culture medium. The third intention of healing requires debridement (Fortunato).
- 30. (D)** Serum or blood clots can form in this dead space and prevent healing by keeping the cut edges of the tissue separated. It is the space caused by separation of wound edges that have not been closely approximated (Fortunato).
- 31. (A)** Closure that is too tight or under tension causes ischemia, a decrease in blood supply to the tissues, and eventually tissue necrosis (Fortunato).
- 32. (B)** When the collagen in the tissue remains constant, the fiber pattern reforms crosslinks to increase tensile

strength in the tissue. Tensile strength is the ability of the tissues to resist rupture (Fortunato).

- 33. (A)** Fibrinogen unites with thrombin (a product of prothrombin and thromboplastin) to form fibrin, which is the basic structural material of blood clots. It is essential for the clotting of blood (Fortunato).
- 34. (B)** A cicatrix or scar is formed by the intertwining of cells surrounding the capillaries and binding together in final closure of a wound. It is a scar left by a healing wound (Fortunato).
- 35. (C)** A keloid is a scar formation of the skin following trauma or surgical incision. The result is a raised, firm, thickened red scar. Black people are especially prone to keloids (Fortunato).
- 36. (B)** Healing by granulation (second intention) involves a wound that is either infected or one in which there is excessive loss of tissue. The skin edges cannot be adequately approximated. Generally, there is suppuration (pus formation), abscess, or necrosis (Fortunato).
- 37. (A)** Precautions must be taken to prevent injuries. To

prevent needle stick injuries, needles should not be recapped, purposely bent or broken by hand, removed from the disposable syringes, or otherwise manipulated by hand. Sharps should be placed in a puncture-resistant container for disposal (Bergquist and Pogolian).

38. (C) Healing by third intention implies that suturing is delayed for the purpose of walling off an area of gross infection involving much tissue removal, as in debridement of a burn when suturing is done later. Third intention of healing means that two opposing granulation surfaces are brought together. Granulation usually forms a wide, fibrous scar (Fortunato).

39. (D) Loose sutures prevent the wound edges from meeting and create dead spaces, which discourage healing. Tight sutures or closure under tension causes ischemia (Fortunato).

40. (C) Second-intention healing is commonly referred to as granulation healing. This form of wound healing takes longer than first intention, but is equally as strong once healed. It heals from the inside to the outside surface (Fortunato).

- 41. (C)** Hazardous body fluids include amniotic fluid, blood, pericardial fluid, peritoneal fluid, pleural fluid, semen, spinal fluid, synovial fluid, and vaginal secretions. Saliva has not been implicated in HIV transmission (Bergquist and Pogosian).
- 42. (B)** A band of scar tissue that binds together two anatomical surfaces that are normally separate from each other is an adhesion. They are not commonly found in the abdomen, where they form after abdominal surgery, inflammation, or injury (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 43. (A)** The *S aureus* is the common cause of boils, carbuncles, impetigo, toxic shock syndrome, and postoperative wound infections (Fuller).
- 44. (B)** *B stearothermophilus* is the spore used to test steam under pressure sterilizers (Fuller)
- 45. (C)** Hospital-acquired infections are known as nosocomial. They can be acquired due to improper technique (Fuller)
- 46. (A)** Vancomycin destroys bacteria by inhibiting cell

wall synthesis and is now the frontline antibiotic therapy used against MRSA (Fuller).

47. (C) *E coli* is part of the normal flora of the intestinal track of humans, most strains are harmless (Fuller).

48. (C) Artificial active acquired immunity is acquired immunity gained by getting a vaccination (Fuller).

49. (B) Gram-negatives appear red from the safranin stain and Gram-positive remain purple (Delmar).

50. (A) Eukaryotes are more complex and include protozoa, fungi, green, red and brown algae and all plant and animal cells including human cells (Delmar).

51. (D) Aseptic technique is among the behaviours and protocols specified in the standard precautions. These evolved from a previous policy called universal precautions established by the CDC for control and prevention (Delmar).

52. (D) Asepsis means absence of microbes and infection (Delmar).

- 53. (B)** Transient flora are microbes which reside on the skin and are easily removed (Delmar).
- 54. (B)** Third intention is employed when the wound is infected or contaminated. There is a delayed primary closure (Delmar).
- 55. (C)** Evisceration is the protrusion of viscera through the edges of a totally separated wound (Fuller).
- 56. (D)** The three phases of wound healing are inflammatory, proliferation, and remodeling (Fuller).
- 57. (D)** Risk factors include location of the surgical site, the health of the patient, condition of tissues and organs, resistance of body tissue, length of the preoperative stay, duration of the procedure, and surgical technique (Fuller).
- 58. (D)** Dehiscence is the tissue breakdown at the wound margin (Fuller).
- 59. (D)** All are wound complications (Fuller).
- 60. (B)** When exudates such as pus, serum, or dead cells around the incision the wound is described as

suppurative (Fuller).

CHAPTER 4

Pharmacology and Anesthesia

Questions

- 1.** A drug that interferes with the blood clotting mechanism is

 - (A) lidocaine
 - (B) fentanyl
 - (C) heparin
 - (D) cefazolin
- 2.** An mg is a measurement of

 - (A) length
 - (B) weight
 - (C) volume
 - (D) temperature
- 3.** The solutions used intravenously to replace plasma when plasma is not available is

 - (A) 0.9% NaCl
 - (B) dextrose 5% in water
 - (C) lactated Ringer's solution
 - (D) dextran

4. How many milliliters are in 1 ounce?

- (A) 10
- (B) 30
- (C) 75
- (D) 100

5. One gram equals

- (A) 100 mg
- (B) 1000 mg
- (C) 100 mL
- (D) 1000 mL

6. A drug used to increase blood pressure is

- (A) Avitene
- (B) epinephrine
- (C) heparin
- (D) mannitol

7. The action of an anticholinergic drug is to reduce

- (A) heart rate
- (B) anxiety
- (C) nausea
- (D) secretions

8. The total volume in a 30-cc syringe is

- (A) 1 ounce
- (B) 2 ounces
- (C) 3 ounces
- (D) 4 ounces

9. Naloxone (Narcan) is an example of a/an

- (A) narcotic antagonist
- (B) mydriatic
- (C) histamine
- (D) diuretic

10. Avitene is

- (A) hemostatic
- (B) adrenergic
- (C) cycloplegic
- (D) mydriatic

11. An absorbable gelatin hemostatic agent that is often soaked in thrombin or epinephrine solution is

- (A) Avitene
- (B) Oxycel
- (C) Nu-knit
- (D) Gelfoam

12. Each of the following agents must be applied using dry gloves or instruments EXCEPT

- (A) Gelfoam
- (B) Collastat
- (C) Avitene
- (D) Helistat

13. An anticoagulant given subcutaneously, intravenously, or as a flush is

- (A) nitroglycerin
- (B) dextran
- (C) heparin
- (D) thrombin

14. A drug that decreases the tendency of blood to clot is

- (A) warfarin sodium
- (B) diazepam
- (C) lorazepam
- (D) midazolam HCl

15. An antibiotic used intraoperatively is

- (A) diazepam
- (B) ketoralac
- (C) Cyclogyl

(D) gentamicin

16. A topical antibiotic is

(A) bacitracin

(B) ephedrine

(C) Ancef

(D) Keflex

17. Which item is used on cut edges of bone to seal off oozing of blood?

(A) Electrocautery

(B) Silver nitrate

(C) Bone wax

(D) Epinephrine

18. The most common diuretic is

(A) Lasix

(B) Pronestyl

(C) Esoptin

(D) Cefadyl

19. An osmotic diuretic agent used to decrease cerebral edema and intraocular edema is

(A) Diuril

- (B) furosemide
- (C) papaverine
- (D) mannitol

20. A systemic agent used to control uterine hemorrhage is

- (A) protamine
- (B) pitocin
- (C) procainamide HCl
- (D) phenylephrine

21. Steroids are used for

- (A) reduction of fluid in body
- (B) reduction of body's need for oxygen
- (C) reduction of tissue inflammation and swelling
- (D) reduction of uterine constriction and contraction

22. Solu-Medrol is a/an

- (A) antibiotic
- (B) myotic
- (C) mydriatic
- (D) anti-inflammatory

23. Tubal patency may be tested by the installation of _____ into the uterine cavity.

- (A) balanced salt solution
- (B) Chymar
- (C) methylene blue
- (D) gentian violet

24. A mydriatic drug, Neo-Synephrine, is used to

- (A) constrict the pupil
- (B) dilate the pupil
- (C) anesthetize the eye
- (D) lower intraocular pressure

25. Immobility of the eye, along with lowered intraocular pressure is facilitated by the use of

- (A) Diprivan block
- (B) Versed block
- (C) Xylocaine block
- (D) Retrobulbar block

26. Miochol is a/an

- (A) antihistamine
- (B) blood thinner
- (C) miotic
- (D) anti-inflammatory

27. An agent that keeps the cornea moist during surgery and is used for irrigation as well is

- (A) mannitol
- (B) Miochol
- (C) Chymar
- (D) BSS

28. An artificial plasma-volume expander is

- (A) mannitol
- (B) dextran
- (C) Ringer's solution
- (D) uromatic

29. An anticoagulant used in vascular surgery is

- (A) protamine sulfate
- (B) heparin
- (C) adrenalin
- (D) papavarine

30. Heparin effects are reversed by

- (A) pitocin
- (B) phenylephrine
- (C) protamine sulfate
- (D) procainamide HCl

31. The universal donor blood that may be given in extreme emergencies until the patient can be typed and crossmatched is

- (A) A
- (B) B
- (C) O
- (D) AB

32. Normal saline is used for laparotomy pack moistening and for intraperitoneal irrigation because it is

- (A) hypotonic
- (B) isotonic
- (C) hypertonic
- (D) hyperkalemic

33. Levophed

- (A) increases cardiac output
- (B) decreases venous return to the heart
- (C) increases urine secretion
- (D) restores and maintains blood pressure

34. A drug used to treat metabolic acidosis is

- (A) Inderal
- (B) Pronestyl

- (C) sodium bicarbonate
- (D) Isuprel

35. The last sensation to leave the patient during general anesthesia induction is

- (A) hearing
- (B) sight
- (C) feeling
- (D) smell

36. An ultrashort acting drug useful during intubation to produce paralysis and also to produce muscle relaxation when used in a dilute solution is

- (A) Sublimaze
- (B) Valium
- (C) Versed
- (D) Anectine

37. Neuroleptoanalgesia combines

- (A) a narcotic and an anticholinergic
- (B) a tranquilizer and narcotic
- (C) an anti-inflammatory and a tranquilizer
- (D) a muscle relaxant and a tranquilizer

38. A sedative/tranquilizer used to reduce anxiety and

apprehension of the pre-op patient and as an adjunct to general anesthesia to reduce the amount and concentration of other more potent agents is

- (A) Valium
- (B) Marzicon
- (C) Anectine
- (D) Demerol

39. An antimuscarinic

- (A) controls pain
- (B) prevents nausea
- (C) limits salivation
- (D) reverses muscle relaxation

40. Anesthesia given in a combination of several agents to obtain optimum results is called

- (A) regional anesthesia
- (B) general anesthesia
- (C) conduction anesthesia
- (D) balanced anesthesia

41. A bolus is

- (A) a small, intermittent dose intravenously
- (B) a dose injected intramuscularly

- (C) a rapid dose, subcutaneously
- (D) a dose injected all at once, intravenously

42. A drug used to soothe and relieve anxiety is a/an

- (A) cholinergic
- (B) analgesic
- (C) sedative
- (D) narcotic

43. A Bier block provides

- (A) anesthesia to a distal portion of an extremity
- (B) anesthesia below the diaphragm
- (C) anesthetic block surrounding a peripheral nerve
- (D) anesthetic block to a nerve group

44. Which inhalation agent is used for short procedures requiring no muscle relaxation?

- (A) Nitrous oxide
- (B) Halothane
- (C) Ethrane
- (D) Forane

45. The most frequently used barbiturate for intravenous anesthesia is

- (A) ketamine
- (B) Anectine
- (C) Sublimaze
- (D) pentothal

46. Halothane is also called

- (A) Ethrane
- (B) Penthrane
- (C) Forane
- (D) Fluothane

47. A method of anesthesia in which medication is injected into the subarachnoid space, affecting a portion of the spinal cord, is called a

- (A) Bier block
- (B) field block
- (C) nerve block
- (D) spinal block

48. The indication for an epidural would be

- (A) anorectal, vaginal, perineal, and obstetric procedures
- (B) lower intestinal procedures
- (C) upper gastrointestinal procedures
- (D) above-the-waist procedures

49. Compazine is

- (A) an antiemetic
- (B) a sedative
- (C) a tranquilizer
- (D) an anticholinergic

50. Which technique can be employed to prevent pain during an operative procedure or to relieve chronic pain?

- (A) Local infiltration
- (B) Bier block
- (C) Nerve block
- (D) Field block

51. The most widely used local anesthetic is

- (A) Carbocaine
- (B) Marcaine
- (C) prilocaine
- (D) lidocaine

52. Another name for adrenalin is

- (A) ephedrine
- (B) epinephrine
- (C) lidocaine

(D) Levophed

53. A vasoconstrictor that, when added to a local anesthetic agent, extends its life is

- (A) ephedrine
- (B) epinephrine
- (C) aramine
- (D) ethrane

54. The purpose of an LMA is

- (A) to establish and maintain a patent airway
- (B) to provide patient cooling
- (C) to monitor body temperature
- (D) to evaluate cardiac and venous status

55. A drug used to reverse hypotension is

- (A) Isuprel
- (B) Inderal
- (C) Pronestyl
- (D) Levophed

56. Blood or fluid can be quickly delivered to a patient via

- (A) rapid infusion pump
- (B) SARA

- (C) Bair Hugger
- (D) Doppler

57. Blood oxygenation can be monitored during surgery by means of a/an

- (A) blood pressure monitor
- (B) arterial catheter
- (C) pulse oximeter
- (D) CVP catheter

58. A drug that could be used to reverse the effect of muscle relaxants is

- (A) Narcan
- (B) protamine sulfate
- (C) Prostigmin
- (D) Valium

59. Arterial blood gases (ABGs) are commonly obtained by accessing the

- (A) femoral artery
- (B) carotid artery
- (C) radial artery
- (D) renal artery

60. Which piece of equipment is of extreme importance

when anesthesia induction begins?

- (A) oximeter
- (B) blood pressure apparatus
- (C) oxygen
- (D) suction

61. Tablets placed under the tongue for rapid absorption are called

- (A) oral
- (B) transdermal
- (C) subungal
- (D) sublingual

62. Pharmacokinetics focuses on how the body

- (A) rejects drugs
- (B) reacts to drugs
- (C) process by which drugs move through the body
- (D) responds to drugs

63. Drug effects that occur predictably, and may not cause a problem are

- (A) adverse reaction
- (B) toxicity
- (C) side effect

(D) therapeutic effect

64. The patented name of medication is also its

- (A) chemical name
- (B) proprietary name
- (C) molecular name
- (D) None of the above

65. A capnometer measures

- (A) oxygen concentration
- (B) CO concentration
- (C) CO₂ concentration
- (D) PO₂ concentration

66. Contrast media for radiographic studies include

- (A) barium sulfate
- (B) Conray
- (C) Isovue
- (D) All of the above

67. The acronym MAC stands for

- (A) monitored anesthesia care
- (B) managed airway control
- (C) metabolic analgesia care

(D) None of the above

68. A drug that constricts the pupil during ophthalmic surgery is

- (A) healon
- (B) miochol
- (C) hyaluronidase
- (D) atropine

69. During general anesthesia, exhaled CO₂ is absorbed by

- (A) soda lime reservoir
- (B) vaporizer
- (C) ventilator
- (D) breathing bag

70. Cricoids pressure

- (A) paralyzes the patient
- (B) produces complete anesthesia
- (C) occludes the esophagus
- (D) is done during extubation

71. Methods or routes used to administer general anesthesia include

- (A) endotracheal, MAC
- (B) inhalation, intravenous
- (C) rapid infusion pump, automatic ventilation system
- (D) All of the above

72. Extubation occurs during which phase of anesthesia?

- (A) Recovery
- (B) Emergence
- (C) Induction
- (D) Maintenance

73. The drug used to treat malignant hypothermia is

- (A) Dantrolene
- (B) Levophed
- (C) Depomedrol
- (D) Digoxin

74. An example of a depolarizing muscle relaxant is

- (A) Halothane
- (B) Fentanyl
- (C) Sufentanyl
- (D) Succinylcholine

75. During ophthalmic surgery, paralysis of the ciliary muscle is achieved by using

- (A) cycloplegics
- (B) myotics
- (C) mydriatics
- (D) narcotics

76. Zofran is an

- (A) antiemetic
- (B) sedative
- (C) tranquilizer
- (D) anticholinergic

77. Benzodiazapines produce _____ for up to 6 hours from the onset of the drugs action

- (A) pain relief
- (B) hallucinations
- (C) antigrade amnesia
- (D) relief from nausea

78. IV lines are preoperatively placed to

- (A) immediate intravenous access for medications
- (B) maintain and manipulate fluid volume
- (C) maintain electrolyte balance
- (D) all of the above

79. The number of “rights” to safe medication administration is

- (A) 3
- (B) 4
- (C) 5
- (D) 6

80. The intensity of contractions is increased with the use of

- (A) oxytocin
- (B) glucagon
- (C) heparin
- (D) lugols

81. Drugs used to reduce the reabsorption of water via the renal tubules and increase the amount of sodium secreted are known as

- (A) anticoagulants
- (B) anticholinergics
- (C) diuretics
- (D) colloids

82. A medication that is placed between the lip and the cheek to be absorbed by mucous membranes is

- (A) parenteral
- (B) buccal
- (C) subungal
- (D) oral

83. The most accurate method used to measure liquid medication is

- (A) syringe
- (B) measuring cup
- (C) tablespoon
- (D) teaspoon

84. Which name is derived from the molecular formula of a drug?

- (A) Brand
- (B) Proprietary
- (C) Chemical
- (D) Generic

85. An undesirable or intolerable reaction to a drug administered at the normal dosage, is defined as

- (A) toxicity
- (B) allergy
- (C) side effect
- (D) adverse reaction

86. The process whereby the drug enters the bloodstream is known as

- (A) absorption
- (B) elimination
- (C) distribution
- (D) metabolism

87. One liter is equal to

- (A) 1000 mL
- (B) 100 mL
- (C) 10,000 mL
- (D) None of the above

88. One gram is equal to

- (A) 1000 mg
- (B) 100 mg
- (C) 10 mg
- (D) 1 mg

89. Medications used to prevent post op infections are

- (A) antiemetics
- (B) antipyretics
- (C) antibiotics
- (D) agonists

90. Drugs with the potential to lead to abuse are

- (A) narcotic
- (B) prescription
- (C) controlled substances
- (D) All of the above

91. Which organ is primarily responsible for excretion of drugs?

- (A) Kidneys
- (B) Liver
- (C) Gallbladder
- (D) Spleen

92. Anticoagulants such as heparin are used to prevent

- (A) fevers
- (B) nausea
- (C) allergic reactions
- (D) blood clots

93. The generic name for Marcaine is

- (A) xylocaine
- (B) bupivacaine
- (C) oxytocin
- (D) lidocaine

94. The phase of anesthesia occurring when surgery is in progress is

- (A) emergence
- (B) induction
- (C) preinduction
- (D) maintenance

95. Benzodiazepines are categorized as

- (A) analgesics
- (B) sedatives
- (C) cholinergics
- (D) anticholinergics

96. While under general anesthesia, the anesthesiologist monitors the rate, rhythm, and electrical conduction by

- (A) electrocardiogram
- (B) oximetry
- (C) ABGs
- (D) blood pressure cuff

97. Drugs classified as antiemetics are used to prevent

- (A) hypertension
- (B) hypotension

- (C) tachycardia
- (D) nausea

98. A warming blanket which contains warm air and is used on patients during surgery is called

- (A) bair hugger
- (B) SCDs
- (C) TEDs
- (D) hypothermic unit

99. The trade name for xylocaine is

- (A) pontecaine
- (B) marcaine
- (C) lidocaine
- (D) sensorcaine

00. The vasoconstrictor used with lidocaine to prolong the effects of the anesthetic is

- (A) epinephrine
- (B) heparin
- (C) protamine sulfate
- (D) digoxin

01. Which drug is the antagonist to heparin?

- (A) Depomedrol
- (B) Papaverine
- (C) Protamine sulfate
- (D) Dantrolene

02. When the surgeon performs an intraoperative cholangiogram he uses

- (A) renografin
- (B) conray
- (C) barium sulfate
- (D) gentian violet

03. Another name for anectine is

- (A) succinylcholine
- (B) halothane
- (C) fluothane
- (D) fentanyl

04. Malignant hyperthermia can be triggered by

- (A) succinylcholine
- (B) Demerol
- (C) morphine
- (D) valium

05. Patient is receiving 1 L of 5% dextrose in water as an

IV fluid during her 1-hour surgery. The number of grams of dextrose the patient has received during this infusion is

- (A) 5 g
- (B) 50 g
- (C) 500 g
- (D) .5 g

06. The needed medication comes in 100 mg per 1 cc. The surgeon wants 50 mg. Your syringe will draw up _____ of the medication.

- (A) .5 cc
- (B) 1 cc
- (C) 2 cc
- (D) 3 cc

07. One ounce is equal to _____ cc.

- (A) 60 cc
- (B) 1 cc
- (C) 30 cc
- (D) 10 cc

08. A 1000 mL is roughly equal to

- (A) 1 quart

- (B) 1 pint
- (C) 1 gallon
- (D) 1 cup

09. The vial the circulating nurse is holding is labeled 75 mg per 1 cc. The surgeon wants 150 mg of the medication. You will draw up

- (A) .75 cc
- (B) 1.5 ccs
- (C) 2 ccs
- (D) None of the above

Answers and Explanations

- 1. (C)** Heparin and warfarin are anticoagulant drugs that interfere with blood clotting mechanism (Association of Surgical Technologists).
- 2. (B)** Kilograms, grams, milligrams, and micrograms are the metric weight designations (Association of Surgical Technologists).
- 3. (D)** Dextran, artificial plasma, is used when plasma is not available (Association of Surgical Technologists).
- 4. (B)** An ounce (fluid, apothecaries) is a measure for liquids. It is equal to 29.6 mL; thus, 30 mL (Tortora and Grabowski).
- 5. (B)** One gram (g) is equal to 1000 mg (Association of Surgical Technologists).
- 6. (B)** Epinephrine is an adrenergic which increases blood pressure (Association of Surgical Technologists).
- 7. (D)** Anticholinergics block secretions, an example is atropine or scopolamine (Association of Surgical

Technologists).

- 8. (A)** One fluid ounce equals 29.573 mL. One milliliter equals 1 cc. Thus, 30 cc equals 1 ounce (Tortora and Grabowski).
- 9. (A)** A narcotic antagonist is given to reverse the effects of a narcotic (Association of Surgical Technologists).
- 10. (A)** Avitene is a microfibrillar collagen hemostatic agent. It is an adjunct to hemostasis when conventional methods are ineffective. It is an absorbable topical agent of purified bovine collagen, and it must be applied in its dry state. It is very expensive (Fortunato).
- 11. (D)** Gelfoam is an absorbable hemostatic agent that aids in clot formation and absorbs 45 times its own weight in blood. It is frequently soaked in thrombin or epinephrine solution and dipped in it before handing to the surgeon (Association of Surgical Technologists).
- 12. (A)** Gelfoam can be used wet or dry. Each of the others must be applied dry (Fortunato).

- 13. (C)** Heparin prolongs clotting time and may be given simultaneously, intravenously, or as a flush to keep IV lines open or to flush the lumen of a blood vessel (1 mL heparin in 100 mL normal injectable saline) (Fortunato).
- 14. (A)** Warfarin sodium is a coumarin derivative that depresses blood prothrombin and decreases tendency of blood platelets to cling together, thus decreasing blood clotting. The others are either sedatives or help provide a calm, hypnotic state preoperatively (Fortunato).
- 15. (D)** An antibiotic used intraoperatively is Gentamicin (Association of Surgical Technologists).
- 16. (A)** Bacitracin is a topical antibiotic (Meeker and Rothrock).
- 17. (C)** Bone wax, made from refined and sterilized bee's wax, is used on cut edges of bone to seal off oozing blood. Soften by kneading before use (Association of Surgical Technologists).
- 18. (A)** Lasix (furosemide) increases the amount of urine secreted and is a common diuretic (Fortunato).

- 19. (D)** Mannitol, an osmotic diuretic, is given prophylactically to prevent renal failure. It is also used to decrease intracranial and intraocular pressure (Fortunato).
- 20. (B)** Pitocin is a trademark for an oxytocic (oxytocin), a hormone produced by the pituitary gland, which is prepared synthetically for therapeutic injection. In labor and delivery, it is given to contract the uterus after placenta delivery or systemically to control uterine hemorrhage (Fortunato; Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 21. (C)** Steroids reduce tissue inflammation and postoperative swelling. Examples are Decadron and Cortisporin ophthalmic ointment. In eye surgery, they are applied topically to reduce postoperative swelling. In plastic surgery, they are applied in and around the site in patients who tend to form keloids (Meeker and Rothrock).
- 22. (D)** Methylprednisolone (Medrol) is an adrenal corticosteroid drug. Corticosteroids prevent the normal inflammatory response; thus, it is anti-inflammatory. In eye surgery, they reduce the resistance of the eye to invasion by bacterial viruses and fungi (Fortunato; Mosby's Medical, Nursing, and

Allied Health Dictionary, 5th ed.).

- 23. (C)** To test tubal patency, methylene blue or Indigo carmine in a saline solution are introduced into the uterine cavity. The tubes are viewed through a laparoscope. Dye seen coming from one or both tubes indicates patency (Fortunato).
- 24. (B)** This dilates the pupil (Fortunato).
- 25. (D)** A retrobulbar block results in a quiet eye and also immobility of the eye and lowered intraocular pressure (Fortunato).
- 26. (C)** Miochol is a myotic (mytotic, miotic) used to constrict the pupil. It reduces intraocular pressure or in cataract surgery helps prevent the loss of the vitreous (Fortunato).
- 27. (D)** Balanced salt solution is used to keep the cornea moist during surgery and also is an irrigant for the anterior or posterior segment (Meeker and Rothrock).
- 28. (B)** Dextran is an artificial volume expander that acts by drawing the fluid from the tissues. It remains in the circulation for several hours. It is used in emergency

situations to treat shock by increasing blood volume (Fortunato).

29. (B) Heparin is the most common drug used in vascular surgery to anticoagulate the patient. Protamine reverses heparin (Meeker and Rothrock).

30. (C) Heparin is reversed by protamine. It should be given slowly (Meeker and Rothrock).

31. (C) Type O blood is the universal donor blood. The four main types are A, B, O, and AB (Fortunato).

32. (B) Normal saline is used because it is isotonic (contains an amount of salt equal to that of intracellular and extracellular fluid), thus will not alter sodium, chloride, or fluid balance (Fortunato).

33. (D) Levophed (norepinephrine) restores and maintains blood pressure following peripheral vascular collapse or as a result of severe hypotensive or cardiogenic shock (Fortunato).

34. (C) Sodium bicarbonate treats acidosis. It should not be mixed in an IV line (Fortunato).

- 35. (A)** During the induction phase, the patient retains an exaggerated sense of hearing until the last moment. Thus, it is essential that all personnel in the room remain as quiet as possible (Fortunato).
- 36. (D)** Succinylcholine (Anectine) is an ultrashort acting agent with rapid onset and is useful to produce paralysis during intubation as well as continuing muscle relaxation when used in a dilute solution (Fortunato).
- 37. (B)** The combination of a narcotic (potent analgesic) and a tranquilizer (neuroleptic) produce neuroleptoanalgesia. When these are reinforced with an inhalation anesthetic, it is called neuroleptoanesthesia (balanced anesthesia) (Association of Surgical Technologists).
- 38. (A)** Benzodiazepines (sedative tranquilizers) are used in two ways to reduce the anxiety and apprehension of the patient and as an adjunct to general anesthesia to reduce the amount and concentration of other more potent agents; Valium and Versed are examples (Association of Surgical Technologists).
- 39. (C)** Antimuscarinics (formerly known as

anticholinergics) act as blockers of the cholinergic effects thus limit salivation and brady-cardia, for example, atropine sulfate and glycopyrrolate (Association of Surgical Technologists).

- 40. (D)** Balanced anesthesia is a technique whereby the properties of anesthesia (hypnosis, analgesia, and muscle relaxation) are produced in varying degrees by a combination of agents (Fortunato).
- 41. (D)** A bolus is a rapid medication dose injected all at once intravenously (Fortunato).
- 42. (C)** Sedatives are drugs that soothe and relieve anxiety. The only difference between a hypnotic and a sedative is one of degree. A hypnotic produces sleep; whereas, a sedative provides mild relaxation. It is quieting and tranquilizing (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 43. (A)** A Bier block provides anesthesia to the distal portion of the upper extremity by injecting an anesthetic agent into a vein at a level below a tourniquet (double cuffed). The limb is exsanguinated with Esmarch, and the cuff is inflated (Association of Surgical Technologists).

- 44. (A)** Nitrous oxide has a rapid induction and recovery. It is used on short procedures, when muscle relaxation is unimportant (Fortunato).
- 45. (D)** Pentothal (thiopental sodium) is potent; it has a cumulative effect and very rapid uptake from the blood. It is the most frequently used and it is short acting (Fortunato).
- 46. (D)** A widely used halogenated hydrocarbon is Fluothane, also known as halothane. It is nonflammable and provides smooth induction (Fortunato).
- 47. (D)** Spinal anesthesia is an extensive nerve block, sometimes called a subarachnoid block. It affects the lower spinal cord and nerve roots. It is used for lower abdominal or pelvic procedures (Fortunato).
- 48. (A)** An epidural is used for anorectal, vaginal, perineal, and obstetrical procedures. Injection is made into the space surrounding the dura mater within the spinal canal (the epidural space) (Fortunato).
- 49. (A)** Compazine is an antiemetic that minimizes nausea and vomiting (Fortunato).

- 50. (C)** Nerve blocks may be used preoperatively, intraoperatively, and postoperatively to prevent pain or therapeutically to relieve chronic pain. In a field block, the surgical site is blocked off with a wall of anesthetic drug (Fortunato).
- 51. (D)** Lidocaine hydrochloride (Xylocaine) is a most widely used agent. It is potent, has rapid onset and lacks local irritation effects. Allergic reactions are rare (Fortunato).
- 52. (B)** Adrenalin is another name for epinephrine (Fortunato).
- 53. (B)** Epinephrine is added to a local anesthetic when a highly vascular area is to be injected. It causes vasoconstriction at the operative site. This holds the anesthetic in the tissue, prolongs its effect, and minimizes local bleeding (Fortunato).
- 54. (A)** LMA (laryngeal mask airway) is a device placed into the laryngopharynx through the mouth to form a low pressure seal (with an inflated balloon) around the laryngeal inlet. It is a simple, effective way of establishing a patent airway (Association of Surgical Technologists).

- 55. (D)** Levophed is a potent peripheral vasoconstrictor. It is useful in peripheral vascular collapse, such as hypotension or cardiogenic shock. Some of its actions are similar to epinephrine (Fortunato).
- 56. (A)** A rapid infusion pump aids in rapidly delivering blood or other fluids by means of a pressurized cuff around the administration bag to exert external force. It may also have a fluid warmer component (Association of Surgical Technologists).
- 57. (C)** The pulse oximeter measures blood oxygenation. The finger tip is commonly used. It is a continuous, rapid, and easy means of assessment (Association of Surgical Technologists).
- 58. (C)** Neostigmine, also known as Prostigmin, reverses the effect of muscle relaxants (Fortunato).
- 59. (C)** Arterial blood gases (ABGs) involve invasive monitoring of pH, oxygen saturation, and CO₂ levels. A common site is the radial artery (arterial line or a-line). Direct blood pressure monitoring may also be performed this way (Association of Surgical Technologists).

- 60. (D)** Suction must always be available and ready, along with assistance to the anesthesiologist, as induction begins for the safety of the patient (Association of Surgical Technologists).
- 61. (D)** Rationale: when a tablet is placed under the tongue, this is sublingual (Fuller).
- 62. (C)** Pharmacokinetics is the movement of a drug through the tissues and cells of the body including the process of absorption, distribution, and localization in tissues (Fuller).
- 63. (C)** Anticipated effects of a drug other than those intended are side effects (Fuller).
- 64. (B)** The patented name given to the drug by its manufacturer is its proprietary name (Fuller).
- 65. (C)** Expired CO₂, which is a product of ventilation, is measured. The exhaled gas is analyzed and the results displayed in wave form on a monitor. This is capnography (Fuller).
- 66. (D)** These are all examples of radiopaque solutions introduced into body cavities to outline their inner

surfaces (Fuller).

67. (A) MAC is monitoring of vital functions during regional anesthesia to ensure patients safety and comfort (Fuller).

68. (B) Miochol is a cholinergic, which rapidly constricts the pupil and is used intraocularly during anterior segment surgery and is reconstituted immediately before surgery (Fuller).

69. (A) Exhaled CO₂ is captured from this system, measured and absorbed by a soda lime reservoir (Fuller).

70. (C) Cricoid pressure is digital occlusion of the esophagus by applying external pressure over the cricoids cartilage during intubation (Rothrock).

71. (B) The patient is induced with an inhalation anesthetic by mask or with an IV sedative, which causes unconsciousness (Fuller).

72. (B) The emergence phase is the cessation of the anesthetic. Reversal drugs may be administered and the patient regains consciousness (Fuller).

- 73. (A)** Dantrolene relieves symptoms of malignant hypothermia by acting on the SR to block calcium release which relieves muscle spasticity (Pharmacology for Nursing Care, 4th ed.).
- 74. (D)** Succinylcholine is a neuromuscular blocking agent (Pharmacology for Nursing Care, 4th ed.).
- 75. (A)** Cycloplegics are drugs that cause paralysis of the ciliary muscle (Pharmacology for Nursing Care, 4th ed.).
- 76. (A)** Zofran is an agent that blocks serotonin receptors and on afferent vagal neurons in the upper GI tract (Pharmacology for Nursing Care, 4th ed.).
- 77. (C)** Benzodiazepines cause antegrade amnesia which is loss of recall of events for up to 6 hours from the onset of the drug's action (Pharmacology for Nursing Care, 4th ed.).
- 78. (D)** All of these are achieved by inserting an intravenous line (Fuller).
- 79. (D)** In addition to the right drug, the right dose, the right route, the right patient, and the right time, there

is a sixth right that applies to medications used on the surgical field. It is the right surgical label (Fuller).

80. (A) Drugs that enhance uterine contractions are called uterotropics. The most common is oxytocin (Fuller).

81. (C) A diuretic is an agent that promotes urine secretion. These drugs are prescribed to rid the body of excess fluid (Miller-Keane).

82. (B) Buccal is defined as pertaining to or directed toward the cheek (Miller-Keane).

83. (A) A syringe is the most accurate instrument used when measuring and dispensing a liquid (Fuller).

84. (C) Chemical names are derived from the molecular formula of a drug following the International Convention (Fuller).

85. (D) Adverse reaction is an undesirable or intolerable reaction to a drug administered at the normal dosage (Fuller).

86. (A) Absorbtion is the process in which a drug enters the bloodstream following administration. Absorbtion

usually involves chemical and physical breakdown of the drug (Fuller).

87. (A) One liter is equal to 1000 mL (Fuller).

88. (A) One gram is equal to 100 milligrams (Fuller).

89. (C) A chemical compound produced by and obtained from certain living cells especially bacteria, yeast and mold or an equivalent synthetic compound which is an antagonist to some other form of life especially pathogenic or noxious organisms (Miller-Keane).

90. (D) All of these have the potential for abuse. These are rated according to their risk potential (Fuller).

91. (A) Drugs are mainly eliminated or cleared from the body through the kidneys (Fuller).

92. (D) Anticoagulants are used to prevent the coagulation of blood (Miller-Keane).

93. (B) Bupivacaine is the generic name for Marcaine (Fuller).

- 94. (D)** Maintenance is the phase involving continuation of the anesthetic agent, unconsciousness is maintained with the inhalation agent and adjunct agents (Fuller).
- 95. (B)** Benzodiazapines are a group of drugs that prevent and relieve anxiety (Fuller).
- 96. (A)** Electrocardiography is the graphic recording from the body surface of the potential of electric currents gathered and generated by the heart (Miller-Keane).
- 97. (D)** An antiemetic is an agent that relieves vomiting (Miller-Keane).
- 98. (A)** A bair hugger is a blanket, which connects to a hose, which blows hot air in order to maintain the patient's body temperature (Fuller).
- 99. (C)** Lidocaine is the trade name for xylocaine (Fuller).
- 00. (A)** The vasoconstrictor used with lido-caine to prolong the duration of lidocaine is epinephrine (Fuller).
- 01. (C)** Protamine is given to reverse the effects of heparin (Fuller).

- 02. (A)** Renografin is a contrast medium used to outline hollow organs or vessels before radiographs are obtained (Fuller).
- 03. (A)** Anectine or succinylcholine produces a state known as depolarizing neuromuscular blockage (Miller-Keane).
- 04. (A)** Malignant hyperthermia is a rare potentially fatal condition that can be triggered by succinylcholine and other inhalation anesthetics as well (Miller-Keane).
- 05. (B)** Medications described by percentages describe grams per 100 cc. $5\% = 5 \text{ g per } 100 \text{ cc}$ of fluid. This is 1 liter of 1000 cc total so this equal to 10×5 .
- 06. (A)** If 1 cc contains 100 mg, 50 mg equals one half that amount or .5 ccs.
- 07. (C)** One ounce is equal to 30 ccs.
- 08. (A)** A 1000 mL is approximately equal to 1 quart.
- 09. (C)** If 1 cc contains 75 mg then 2 cc equals 150 mg.

SECTION II

Infection Control

CHAPTER 5

Aseptic Technique

Questions

- 1.** The minimum distance a nonsterile person should remain from a sterile field is

 - (A) 6 inches
 - (B) 1 foot
 - (C) 2 feet
 - (D) 3 feet
- 2.** Identify which of the following is NOT a safe practice

 - (A) discard opened sterile bottles
 - (B) sterile persons drape first toward themselves, than away
 - (C) sterile persons face sterile areas
 - (D) sterile tables may be covered for later use
- 3.** Tables are considered sterile

 - (A) on the top and 2 inches below the table level
 - (B) up to 2 feet off the ground
 - (C) on the top and in the area that has been pulled close to the sterile field

(D) only on the top

4. At the end of the case, drapes should be

(A) pulled off and placed in a hamper

(B) rolled off and placed on the floor so they can be checked for instruments

(C) rolled off and placed in a hamper

(D) checked for instruments, rolled off, and placed in a hamper

5. If a solution soaks through a sterile drape

(A) discard drape and replace it

(B) cover wet area with impervious sterile drape or towel

(C) cover wet area with at least two layers of fabric

(D) fill out an incident report at the end of the case

6. Which of the following is not an acceptable wrapper for gas sterilization?

(A) Nylon

(B) Muslin

(C) Paper

(D) Plastic

7. Which of the following is the only acceptable plastic

that can be used for a steam sterilization wrapper?

- (A) Polyethylene
- (B) Polypropylene
- (C) Polyamide
- (D) Polyvinyl chloride

8. All of the following statements regarding muslin wrappers are true EXCEPT

- (A) muslin must be laundered, even if unused, in order to rehydrate it
- (B) a 140 thread count of unbleached muslin is used for wrappers
- (C) muslin is flexible and easy to handle
- (D) small holes can be repaired by stitching on a patch

9. Packages wrapped in muslin must have

- (A) one thickness
- (B) two thicknesses
- (C) three thicknesses
- (D) four thicknesses

10. The maximum storage life for a muslin-wrapped item in a closed cabinet is

- (A) 7 days

- (B) 14 days
- (C) 21 days
- (D) 30 days

11. An item dropped on the floor is considered safe only if

- (A) it is wrapped in woven material
- (B) it is enclosed in an impervious material
- (C) it is used right away
- (D) it is inspected carefully

12. When using a pour solution

- (A) a portion may be poured and the cap replaced
- (B) the contents must be used or discarded after the bottle is opened
- (C) the cap may be replaced if it has not been placed on a nonsterile surface
- (D) the solution may be used on the same case if the cap is not replaced

13. What is the standard safety margin on package wrappers?

- (A) Up to the edge
- (B) Less than 1 inch
- (C) 1 inch or more
- (D) None of the above

14. When opening a wrapper, the circulator should open the top flap

- (A) toward self
- (B) away from self
- (C) after the sides
- (D) over sterile field

15. When the scrub nurse opens an inner sterile wrapper

- (A) the side nearest the body is opened first
- (B) the side nearest the body is opened last
- (C) the lateral areas are done first
- (D) Both A or B

16. When flipping a sterile item onto the field, the circulator may

- (A) lean over the sterile field to shake item out of package
- (B) project item without reaching over the sterile field
- (C) shake item into sterile basin stand
- (D) lean over sterile linen pack and drop item onto it

17. Gowns are considered sterile only from

- (A) waist to neck level in front and back, and the sleeves

- (B) waist to shoulder, front and back, and the sleeves
- (C) neck to thighs in front and the sleeves
- (D) only in front from chest to sterile field level, and sleeves from elbow to cuffs

18. An acceptable action when drying the hands and arms after the surgical scrub is to

- (A) dry from elbow to fingertip
- (B) dry thoroughly, cleanest area first
- (C) keep the hands and arms close to the body, at waist level
- (D) dry one hand and arm thoroughly before proceeding to the next

19. All of the following statements regarding gowning another person are true EXCEPT

- (A) open the hand towel and lay it on the person's hand
- (B) hand the folded gown to the person at the neckband
- (C) keep hands on the outside of the gown under a protective cuff
- (D) release the gown once the person touches it

20. Which statement regarding the scrub procedure is NOT true?

- (A) It reduces the microbial count
- (B) It leaves an antimicrobial residue
- (C) It renders the skin aseptic
- (D) It removes skin oil

21. If the scrub nurse needs to change a glove during an operation

- (A) the scrub must also regown
- (B) the circulator pulls the glove off
- (C) the scrub pulls the glove off
- (D) the scrub uses closed-glove technique to reapply gloves

22. Which statement regarding the removal of gown and gloves does NOT meet safe criteria?

- (A) The gloves are removed before the gown
- (B) The gown is pulled off inside out
- (C) The gown is untied by the circulator
- (D) The gloves are removed inside out

23. An effective surgical scrub procedure is

- (A) time method
- (B) brush-stroke method
- (C) 3-minute anatomic method

(D) Both A and B

24. Regarding the surgical scrub, which statement would violate acceptable practice?

- (A) Fingernails should not reach beyond fingertip
- (B) Nail polish may be worn if freshly applied
- (C) Anyone with a cut, abrasion, or hangnail should not scrub
- (D) A non-oil-based hand lotion may be used to protect the skin

25. Eyewear, goggles, and/or face shields should be worn

- (A) on every case
- (B) on orthopedic cases
- (C) on vascular cases
- (D) on positive HIV cases

26. The surgical scrub is

- (A) sterilization of the skin
- (B) mechanical cleansing of the skin
- (C) chemical cleansing of the skin
- (D) mechanical washing and chemical antisepsis of the skin

27. Scrub technique ends

- (A) 2 inches below the elbow
- (B) just below the elbow
- (C) at the elbow
- (D) 2 inches above the elbow

28. Which statement regarding the surgical scrub indicates INAPPROPRIATE preparation by the scrub?

- (A) Artificial nails/devices must not cover nails
- (B) Nail polish may be worn, if not chipped
- (C) Finger nails should not reach beyond fingertips
- (D) Skin should be protected with a non-oil-based product

29. Which statement best describes an effective surgical hand scrub?

- (A) Time, no anatomical sequence
- (B) Number of strokes, no anatomical sequence
- (C) Time or number of strokes, hand to elbow sequence
- (D) Number of strokes, elbow to hand sequence

30. The brush-stroke method of scrubbing prescribes the number of strokes required. Indicate the number for each: nails, fingers, hand (back and palm) and arms.

- (A) 40, 30, 30, 30
- (B) 40, 40, 20, 20
- (C) 30, 20, 20, 20
- (D) 30, 20, 10, 10

31. Evidence-based practice (EBP) relies on

- (A) opinion and tradition
- (B) past evident practices
- (C) current practices
- (D) science and evidence

32. Standard precautions evolved from a practice called

- (A) universal
- (B) aseptic technique
- (C) EBP
- (D) the method of thinking and doing

33. When water comes in contact with a sterile drape or gown, it can cause

- (A) strike through contamination
- (B) slippery surface
- (C) resident flora
- (D) create a potential fire hazard

34. Standards during surgery include all EXCEPT

(A) nonsterile team members do not pass between two sterile fields

(B) sterile gowns are only considered sterile from the waist to the axillary lines, from hands to shoulders

(C) movement should be kept to a minimum

(D) if there is any doubt about the sterility of the item, consider it contaminated

35. When removing sterile attire, arrange following in proper order (1) remove your gloves, (2) remove your gown, (3) remove your mask, (4) remove gown and gloves together, then mask:

(A) 1, 2, 3

(B) 4

(C) 2, 1, 3

(D) 3, 2, 1

36. When opening sterile supplies, all the following are proper techniques EXCEPT

(A) do not readjust the table drape after it has been opened

(B) open the first flap away from you on an unwrapped item

(C) remember not to lean over the sterile field

(D) when opening items in a peel pouch, slowly allow

the item to slide out of the package onto the sterile field

37. When opening supplies for a case, what should be passed directly to the scrub, or flipped in an area where they are clearly visible?

- (A) Medications
- (B) 10 cc syringe
- (C) Peanuts
- (D) Blades

38. Sterile personnel must pass each other

- (A) right to left
- (B) should never pass each other
- (C) back to back, front to front
- (D) does not really matter because gowns that wrap around are used

39. What is known as the center of your sterile field?

- (A) Back table
- (B) Mayo
- (C) Surgeon
- (D) Draped patient

40. If there is a break in sterile technique during the

procedure, the STSR should tell

- (A) the surgeon
- (B) the person who broke technique
- (C) the circulator
- (D) everyone in the lounge

Answers and Explanations

- 1. (B)** All nonsterile persons should remain at least 1 foot from any sterile surface (Fortunato).
- 2. (D)** Sterile tables should be set up just before the surgical procedure. Covering of tables is not recommended (Fortunato).
- 3. (D)** A sterile draped table is considered sterile only on the top. The edges and sides extending below table level are considered nonsterile (Fortunato).
- 4. (D)** Check drapes for instruments. Roll drapes off the patient to prevent sparking and airborne contamination. Wet areas should be placed in the center to prevent soaking through the laundry bag (Fortunato).
- 5. (B)** If a solution soaks through a sterile drape to a nonsterile area, the wet area is covered with impervious sterile drapes or towels (Fortunato).
- 6. (A)** Nylon is not used for ethylene oxide (EO) sterilization because of inadequate permeability;

however, muslin, nonwoven fabric, paper, and plastic are safely used. Items wrapped for gas sterilization should be tagged to avoid inadvertent steam sterilization (Fortunato).

- 7. (B)** Polypropylene film of 1- to 3-mm thickness is the only plastic acceptable for steam sterilization. It is used in the form of pouches presealed on two or three sides. The open sides are then heat sealed (Fortunato).
- 8. (D)** Small holes can be heat sealed with double-vulcanized patches; they can never be stitched because this will leave needle holes in the muslin (Fortunato).
- 9. (D)** Muslin wrappers must have two layers of double thickness (four thicknesses) to serve as a sufficient dust filter and microbial barrier. A 140 thread count muslin is used for wrappers (Fortunato).
- 10. (D)** The storage life for muslin is 30 days maximum in closed cabinets. Muslin wets easily and dries quickly so water stains may not be obvious. On open shelving, the storage life is 21 days (Fortunato).
- 11. (B)** If a sterile package is dropped, the item may be considered safe for immediate use only if it is enclosed in an impervious material and the integrity of

the package is maintained. Dropped items wrapped in woven materials should not be used (Fortunato).

- 12. (B)** After a sterile bottle is opened, the contents must be used or discarded. The cap cannot be replaced without contamination of the pouring edges. The edges of anything that encloses sterile contents are considered nonsterile (Fortunato).
- 13. (C)** A 1-inch safety margin is usually considered standard on package wrappers. After a package is open, the edges are nonsterile (Fortunato).
- 14. (B)** The top flap is opened away from self, the sides turned under, and secured. The last flap is pulled toward the person opening the package (Fortunato).
- 15. (A)** When a scrub nurse opens a sterile wrapper, the side nearest the body is opened first. The portion of the drape then protects the gown, enabling the nurse to move closer to the table to open the opposite side (Fortunato).
- 16. (B)** When flipping a sterile item onto a sterile field, the circulator may never reach over the sterile field and shake the item from the package (Fortunato).

- 17. (D)** Gowns are considered sterile only in front from chest to level of sterile field, and the sleeves from elbow to cuffs (Fortunato).
- 18. (B)** Dry both hands thoroughly but independently. Dry each arm using a rotating motion while moving up the arm to the elbow; do not retrace the area. Bend forward slightly from the waist, holding hands and elbows above the waist and away from the body. The towel should be opened full length and reversed for each arm (Meeker and Rothrock).
- 19. (B)** Before handing a gown, unfold it carefully, holding it at the neckband (Fortunato).
- 20. (C)** The surgical scrub removes skin oil, reduces the microbial count, and leaves an antimicrobial residue on the skin. The skin can never be rendered sterile (aseptic). It is considered surgically clean (Fortunato).
- 21. (B)** To change a glove during an operation, the scrub nurse must turn away from the sterile field. The circulator pulls the glove off inside out, and the open-glove technique is used to don a new pair of gloves (Fortunato).

- 22. (A)** The gown is always removed before the gloves. It is pulled downward from the shoulders, turning the sleeves inside out as it is pulled off the arms. Gloves are turned inside out, using the glove-to-glove then skin-to-skin technique as they are removed. The circulating nurse unfastens the gown at the neck and waist (Fortunato).
- 23. (D)** Either the time method or brush-stroke method is effective if properly executed. Studies have shown that a vigorous 5-minute scrub with a reliable agent is as effective as the 10-minute scrub with less mechanical action (Fortunato).
- 24. (B)** Chipped nail polish harbors microorganisms. No polish is preferred (Fortunato).
- 25. (A)** Using barriers to avoid direct contact with blood and body fluid are the best measures to prevent work-related HIV (Fortunato).
- 26. (D)** The surgical scrub is the process of removing as many microorganisms from the hands and arms by mechanical washing and chemical antisepsis (Fortunato).

- 27. (D)** The arm is scrubbed, including the elbow and the antecubital space to 2 inches above the elbow (Fortunato).
- 28. (B)** Skin and nails should be clean and in good condition. A non-oil-based hand cream should be used. Fingernails should not reach beyond fingertips. No polish should be worn and artificial nails/devices must not cover nails (Fortunato).
- 29. (C)** Time varies with the frequency of the scrub, the agent used, and the method used. The procedure may be time method or counted brush stroke, each of which follows an anatomical pattern of scrub ending 2 inches above the elbow. All steps begin with hands and end with elbow, with the hands having most direct contact (Fortunato).
- 30. (C)** The nails are scrubbed 30 strokes; all sides of each finger, 20 strokes; the back of the hand and palm, 20 strokes; and the arms, 20 strokes to 2 inches above the elbow (Fortunato).
- 31. (D)** Scientific investigation and discovery supersede old practices; it considers only the best on current study and proof. An example is double gloving in the

old days was only done on orthopedic cases. The current practice is for all surgical personnel to double glove for all cases. This is due to EBP (Fuller).

32. (A) Standard precautions evolved from a policy called universal precautions. They were originally established to prevent the spread of HIV and AIDS (Fuller).

33. (A) This occurs when moisture from either side of the drape serves as a vehicle for bacteria to infiltrate the drape from a nonsterile surface (Fuller).

34. (B) Sterile gowns are considered sterile only in the front from the axillary lines to the waist, from the hands to the elbows (Fuller).

35. (C) Gown first, then gloves, and mask last (Fuller).

36. (D) Items wrapped in peel pouches are delivered directly to the scrub (Fuller).

37. (D) Scalpel blades and other sharps should be passed directly to the scrub or flipped on to an open area where they are visibly seen (Fuller).

- 38. (C)** Sterile personnel pass each other back to back or front to front (Fuller).
- 39. (D)** The draped patient is the center of your sterile field during surgery (Fuller).
- 40. (B)** If there is a break in technique during a procedure, the person who broke technique should be told and correct actions should be taken (Fuller).

CHAPTER 6

Sterilization and Disinfection

Questions

- 1.** The amount of pressure necessary in a steam sterilizer set at 250°F is

 - (A) 15–17 pounds
 - (B) 20–22 pounds
 - (C) 22–25 pounds
 - (D) 25–27 pounds
- 2.** Positive assurance that sterilization conditions have been achieved can only be obtained through

 - (A) biologic control test
 - (B) heat-sensitive tape
 - (C) color change monitor
 - (D) mechanical indicator
- 3.** A wrapped tray of instruments is sterilized in a gravity displacement sterilizer at 250°F for

 - (A) 10 minutes
 - (B) 15 minutes
 - (C) 30 minutes

(D) 40 minutes

4. The minimum exposure time for unwrapped instruments in a flash sterilizer that is set at 270°F (132°C) is

(A) 2 minutes

(B) 3 minutes

(C) 5 minutes

(D) 7 minutes

5. When steam is used to sterilize a rubber tubing or catheter

(A) the lumen must be dried thoroughly before the process begins

(B) a rubber band may be placed around it so it does not unwind

(C) it should be fan-folded before wrapping

(D) a residual of distilled water should be left inside the lumen

6. To be sterilized effectively, a linen pack must not weigh more than

(A) 12 pounds

(B) 14 pounds

(C) 16 pounds

(D) 18 pounds

7. Gravity displacement utilizes _____ to destroy microorganisms.

(A) gas

(B) radiation

(C) gamma rays

(D) steam

8. The process called cavitation occurs in the

(A) moist heat sterilizer

(B) ultrasonic cleaner

(C) high-speed pressure sterilizer

(D) washer–sterilizer

9. All of the following statements regarding instrument sets are true EXCEPT

(A) instruments must be placed in perforated trays

(B) heavy instruments are placed on the bottom

(C) all instruments must be closed

(D) all detachable parts must be disassembled

10. All of the following statements regarding steam sterilization are true EXCEPT

- (A) flat packages are placed on the shelf on edge
- (B) small packages, placed one on top of the other, are crisscrossed
- (C) basins are placed on their sides
- (D) solutions may be autoclaved along with other items as long as they are on a shelf alone

11. Wrapped basin sets may be sterilized by steam under pressure at 250°F for a minimum of

- (A) 5 minutes
- (B) 10 minutes
- (C) 15 minutes
- (D) 20 minutes

12. Which of the following statements regarding the sterilization of basin sets is true?

- (A) Basins must be separated by a porous material if they are nested
- (B) Sponges and linen may be packaged inside the basin to be sterilized
- (C) Basins are placed flat in the autoclave
- (D) Basins must always be placed on the top shelf of the autoclave in a combined load

13. Why would gas sterilization be chosen over steam sterilization?

- (A) It is less expensive
- (B) It is less damaging to items
- (C) It is faster
- (D) It is more effective

14. The chemical agent used in gas sterilization is

- (A) ethylene glycol
- (B) ethacrynate sodium
- (C) ethyl chloride
- (D) ethylene oxide

15. What chemical system uses peracetic acid as the sterilant?

- (A) Ozone gas sterilization
- (B) Steris
- (C) Sterrad
- (D) Vapor phase sterilizer

16. The lumen of a tubing undergoing ethylene oxide (EO) sterilization is

- (A) well lubricated
- (B) dried thoroughly
- (C) prepared with a residual of distilled water
- (D) prepared with a NaCl flush

17. The commercial name for glutaraldehyde is

- (A) peracetic acid
- (B) phenol
- (C) Quats
- (D) Cidex

18. A 30-minute single-use sterilization system useful for endoscopes is

- (A) Steris
- (B) ETO
- (C) steam under pressure
- (D) cold sterilization

19. Which of the following is essential when using activated glutaraldehyde for sterilization?

- (A) Items must be rinsed thoroughly in sterile water before use
- (B) The solution must be heated in order to be effective
- (C) The items must be thoroughly moistened before placement in solution
- (D) The item must be air dried before use

20. What is the shelf life of Cidex?

- (A) Between 14 and 28 days
- (B) 7 days
- (C) 1 month
- (D) Indefinite

21. In which procedure would the use of a high-level disinfectant be acceptable instrument preparation?

- (A) Suction lipectomy
- (B) Tracheotomy
- (C) Cystoscopy
- (D) Mediastinoscopy

22. In a high-speed flash sterilizer, unwrapped instruments are exposed for a minimum of

- (A) 1 minute
- (B) 3 minutes
- (C) 5 minutes
- (D) 10 minutes

23. To kill spores, an item must be immersed in a 2% aqueous solution of glutaraldehyde for

- (A) 20 minutes
- (B) 2 hours
- (C) 10 hours
- (D) 24 hours

24. When placing tubing in an activated glutaraldehyde solution, one should

- (A) use a shallow container
- (B) be certain that the interior of the tubing is completely filled
- (C) moisten it thoroughly before submersion
- (D) Both B and C

25. What is the role of moisture in EO sterilization?

- (A) The items will dry out during the process if no humidity is added
- (B) The sterilizer will deteriorate from gas over a period of time if no moisture is added
- (C) Dried spores are resistant to the gas, so they must be hydrated
- (D) Moisture is not an essential element in gas sterilization

26. “Slow exhaust” in a gravity displacement steam sterilizer is used for

- (A) plastics
- (B) solutions
- (C) rubber
- (D) drape packs

27. What is the function of an aerator in EO sterilization?

- (A) It is used to aerate items before sterilization
- (B) It is a separate unit used to decrease the aeration time
- (C) It is the last cycle in the EO sterilizer, which helps exhaust the gas and add air
- (D) It adds air to the cycle, which is essential for obtaining item sterility

28. Ethylene oxide destroys cells by

- (A) interfering with the normal metabolism of the protein and reproductive processes
- (B) coagulating cell protein
- (C) converting ions to thermal and chemical energy causing cell death
- (D) shrinking the cell

29. Activated glutaraldehyde is used to disinfect endoscopes for

- (A) 5 minutes
- (B) 10 minutes
- (C) 20 minutes
- (D) 60 minutes

30. When using a high-level disinfectant, always

- (A) submerge items while wet
- (B) rinse items with sterile distilled water before using
- (C) soak items in saline before using
- (D) add hot diluent to activated agent

31. The chemical sterilant used in the STERIS method of sterilizing is

- (A) formaldehyde
- (B) Cidex
- (C) ethylene oxide
- (D) peracetic acid

32. How should basins be positioned in the autoclave for sterilization?

- (A) Stacked on top of each other
- (B) On their sides
- (C) Upside down
- (D) Does not matter

33. Gravity displacement, steam sterilizers operate on the principle that

- (A) air is heavier than steam
- (B) air and steam have equal weight
- (C) steam is heavier than air

(D) water is heavier than air

34. The process of terminal decontamination follows every surgical case. Decontamination of the walls consists of

(A) cleaning all walls up to 3 feet

(B) cleaning all walls up to 1 foot

(C) spot clean where soiled

(D) always clean with alcohol

35. Which of the following kills bacterial spores?

(A) Sterilant

(B) Germicide

(C) Antiseptic

(D) Fungicide

36. Instrumentation and equipment are processed according to their level of risk. This system is known as

(A) evidence-based practice

(B) the Spaulding method

(C) reprocessing

(D) central monitoring

37. According to the Spaulding system, what risk is

assigned to sterile body tissue including the vascular system?

- (A) Critical
- (B) Semicritical
- (C) Noncritical
- (D) Intermediately critical

38. What method of sterilization is used on objects that cannot tolerate heat, moisture, and the presence of steam sterilization?

- (A) Gravity displacement
- (B) ETO
- (C) Hydrogen peroxide
- (D) Cidex

39. Gluteraldehyde is a high-level disinfectant, that is, a sporicidal, a bacteriocidal, and a virocidal at a 2% concentration for _____, it is also a tuberculocidal.

- (A) 10 minutes
- (B) 15 minutes
- (C) 20 minutes
- (D) 40 minutes

40. Chemical monitors are placed inside and outside of all packs to be sterilized. This monitor shows

- (A) the item is sterile
- (B) proper packaging is achieved
- (C) the parameters such as heat and pressure have been reached
- (D) the proper time has been met

41. To achieve 270°F, the required pressure is

- (A) 15 psi
- (B) 20 psi
- (C) 27 psi
- (D) 40 psi

42. Why is ethylene oxide diluted with an inert gas?

- (A) It increases its effective sterilization
- (B) It adds convenience and speed
- (C) It adds humidity
- (D) It helps with aeration

43. Bioburden refers to

- (A) the degree of microbial contamination
- (B) a hospital acquired infection
- (C) a chemical agent
- (D) high-level disinfectant

44. Sterility was previously measured by time but is now considered invalid. The principle now used is

- (A) carefully checking sterile indicators
- (B) event-related sterility
- (C) terminal sterilization
- (D) Both B and C

45. The following statements regarding wrapping materials are true EXCEPT

- (A) Disposable nonwoven wrappers are intended for one use only
- (B) You can use two 140 thread count per square inch
- (C) You can use one 280 thread count per square inch
- (D) Peel pouches can be used on all instruments including large heavy instruments and micro instruments

46. Gastrointestinal endoscopes are characterized _____ under the Spaulding sterilization system.

- (A) critical
- (B) noncritical
- (C) semicritical
- (D) scopes are not considered in the Spaulding system

47. All are environmental disinfectants used for low-level

disinfection and terminal decontamination EXCEPT

- (A) gluteraldehyde*
- (B) hypochlorite
- (C) quaternary ammonium compound
- (D) alcohol

48. Personal protective equipment (PPE) includes all of the following EXCEPT

- (A) protective eyewear
- (B) facemask
- (C) surgical and/or patient care gloves
- (D) full protective body suit or gown

49. Most packaged sterilized equipment from a manufacturer such as sutures, sponges, and disposable drapes are sterilized by means of

- (A) ETO
- (B) Cobalt 60 (ionizing radiation)
- (C) gravity displacement sterilizer
- (D) quaternary ammonium compounds

Answers and Explanations

- 1. (A)** Fifteen to seventeen pounds of pressure is necessary in the steam sterilizer set at 250°F. It is 27 psi if set at 270°F (Fortunato).
- 2. (A)** Positive assurance that sterile conditions have been achieved by either steam, ethylene oxide, or dry heat sterilization can be obtained only through a biologic control test. These should be done at least weekly. The most dependable is a preparation of living spores resistant to the sterilizing agent (Fortunato).
- 3. (C)** Instruments wrapped as a set in double-thickness wrappers are autoclaved at a setting of 250°F for 30 minutes (Fortunato).
- 4. (B)** In a flash (high-speed pressure) sterilizer set at 270°F, the minimum exposure time is 3 minutes for unwrapped items. With this cycle, the entire time for starting, sterilizing, etc., is 6–7 minutes (Fortunato).
- 5. (D)** Rubber tubing should not be folded or kinked because steam can neither penetrate it nor displace air

from folds. A residual of distilled water should be left in the lumen. Rubber bands must not be used around solid items because steam cannot penetrate through or under rubber (Fortunato).

- 6. (A)** Linen packs must not weigh more than 12 pounds. Linen must be freshly laundered. Items must be fan-folded or loosely rolled (Fortunato).
- 7. (D)** Gravity displacement utilizes steam under pressure to effect moist heat sterilization (Fortunato).
- 8. (B)** The ultrasonic cleaner (which is not a sterilizer) utilizes ultrasonic energy and high-frequency sound waves. Instruments are cleaned by cavitation. In this process, tiny bubbles are generated by high-frequency sound waves. These bubbles generate minute vacuum areas that dislodge, dissolve, or disperse soil (Fortunato).
- 9. (C)** Hinged instruments must be open with box locks unlocked to permit steam contact on all surfaces. All detachable parts should be disassembled (Fortunato).
- 10. (D)** Solutions are sterilized alone on a slow exhaust cycle to prevent them from boiling over. The pressure gauge must read 0°F before opening the door. This is so the caps will not pop off (Fortunato).

- 11. (D)** Wrapped basin sets are sterilized at 250°F for a minimum of 20 minutes. They are placed on their sides to allow air to flow out of them. This also helps water flow out (Fortunato).

- 12. (A)** Basins and solid utensils must be separated by a porous material if they are nested, to permit permeation of steam around all surfaces, and condensation of steam from the inside during sterilization. Sponges or linen are not packaged in basins (Fortunato).

- 13. (B)** EO gas is an effective substitute for most items that cannot be sterilized by heat or that would be damaged by repeated exposure to heat. It is noncorrosive and does not damage items. It completely penetrates porous materials (Fortunato).

- 14. (D)** Ethylene oxide gas is used to sterilize items that are either heat or moisture sensitive. It kills microorganisms, including spores, by interfering with the normal metabolism of protein and reproductive processes (Fortunato).

- 15. (B)** A proprietary (Steris) chemical formulation of peracetic acid, hydrogen peroxide, and water causes

cell death by inactivating the cell systems (Fortunato).

- 16. (B)** Any tubing or other item with a lumen should be blown out with air to force dry before packaging, as water combines with EO gas to form a harmful acid, ethylene glycol (Fortunato).
- 17. (D)** Glutaraldehyde, a high-level disinfectant is known commercially as Cidex (Association of Surgical Technologists).
- 18. (A)** Peracetic acid is used in a machine (Steris) that heats the sterilant and can be used for endoscopes. The cycle takes 30 minutes, and the sterilant can only be used for a single sterilization cycle, thus is more expensive than other methods (Association of Surgical Technologists).
- 19. (A)** Items must be thoroughly rinsed before use. Solution is reusable for the time set by the manufacturer. Items must be clean and dry before submersion (Fortunato).
- 20. (A)** Glutaraldehyde must be renewed after 14 days because it becomes ineffective after that time (Fuller).

- 21. (C)** In cystoscopy, sterilization of instruments with steam or EO provides the greatest elimination of the risk of infection; however, it is not essential. High-level disinfection is recommended and provides reasonable assurance that items are safe to use (Meeker and Rothrock).
- 22. (B)** The minimum exposure time at 270°F with 27 psi is 3 minutes for unwrapped nonporous items only (Fortunato).
- 23. (C)** Immersion in a 2% aqueous solution of activated, buffered alkaline glutaraldehyde is sporicidal (kills spores) within 10 hours. It is chosen for heat-sensitive items that cannot be steamed or if EO gas is unavailable or impractical (Fortunato).
- 24. (B)** Lumens of instruments or tubing must be completely filled with solution. All items should be placed in a container deep enough to completely immerse them. All items should be dry before immersion so that the solution is not diluted (Fortunato).
- 25. (C)** Moisture is essential in gas sterilization. Desiccated or highly dried bacterial spores are

resistant to EO gas; therefore, they must be hydrated in order for the gas to be effective (Fortunato).

- 26. (B)** Solutions are sterilized alone on slow exhaust so solutions will not boil over and so caps will not blow off (Fortunato).
- 27. (B)** Aeration following EO sterilization can be accomplished at room temperature; however, aeration of exposed items at an elevated temperature (in an aerator) enhances the dissipation rate of absorbed gases, resulting in faster removal. The aerator is a separate unit (Fortunato).
- 28. (A)** EO or ETO is a chemical agent that kills microorganisms, including spores. It interferes with the normal metabolism of protein and reproductive processes, resulting in cell death (Fortunato).
- 29. (C)** A minimum of 20 minutes is used to kill vegetative bacteria, fungi, hepatitis B, and HIV. It is 45 minutes for tuberculocidal activity (Fortunato).
- 30. (B)** Scopes and all accessories that are soaked in activated glutaraldehyde are rinsed well in sterile distilled water to prevent tissue irritation from the

solution (Fortunato).

- 31. (D)** Peracetic acid or acetic acid mixed with a solution of salts (Bionox) kills microorganisms. It is used only in the Steris system for heat-sensitive and immersible instruments. Processing is 20–30 minutes, temperature is controlled at 131°F; it is cost-effective, and environment friendly (Fortunato; Meeker and Rothrock).
- 32. (B)** Basins, jars, cups, or other containers should be placed on their sides with the lid ajar so that air can flow out and steam can enter (Fuller).
- 33. (A)** Gravity displacement steam sterilizers operate on the principle that air is heavier than steam. Steam is forced into the inner chamber. Any air in the inner chamber blocks the passage of pressurized steam and prevents sterilization (Fuller).
- 34. (C)** Walls, doors, surgical lights, and ceilings are spot cleaned if they are soiled with blood tissue or body fluids (Fuller).
- 35. (A)** Spores are not killed unless an item is sterilized (Delmar).

- 36. (B)** The Spaulding system assigns a risk category that is specific to the regions of the body in which a device is to be used (Fuller).
- 37. (A)** Critical risk is assigned to sterile body tissues including the vascular system (Fuller).
- 38. (B)** ETO is used to sterilize objects that cannot tolerate heat, moisture, and the pressure of steam sterilization (Fuller).
- 39. (C)** Two percent gluteraldehyde is a tuberculocidal when item is sterilized for 20 minutes (Delmar).
- 40. (C)** Subjecting items to the process of sterilization does not ensure that the item is sterile, but only that the parameters such as heat and pressure have been met (Fuller).
- 41. (C)** The laws of physics tell us to raise the temperature of steam, we must also raise the pressure in the closed sterilization chamber, to achieve 270°F, and the required pressure is 27 psi (Fuller).
- 42. (A)** When blended with inert gas, it produces effective sterilization by destroying DNA and the protein

structure of microorganisms (Delmar).

- 43. (A)** Bioburden is the number and the type of live bacterial colonies on the surface before it is sterilized (Delmar).
- 44. (D)** Event-related sterility or terminal sterilization is based on the principles that sterilized items are assumed sterile between uses unless environmental conditions or events interfere with the integrity of the package (Fuller).
- 45. (D)** Peel pouches are intended for light-weight instruments and devices (Fuller).
- 46. (C)** Gastrointestinal scopes come in contact with mucous membranes or nonintact skin. They are semicritical items (Fuller).
- 47. (A)** Environmental disinfectants that are used for routine low-level disinfection and terminal decontamination include phenolics, quats, hypochlorites, and alcohol. Gluteraldehyde is a high-level disinfectant known as Cidex commonly used on instruments (Fuller).

48. (C) All staff members who work in the decontamination area must wear PPE in compliance with government regulations. Only gloves approved for contact with chemical disinfectants are used. Surgical gloves and patient care gloves are not permitted (Fuller).

49. (B) Most equipment available that is packaged from the manufacturer has been sterilized by Cobalt 60 or ionizing radiation. This process is restricted to commercial use because of its expense (Fuller).

CHAPTER 7

Operating Room Environment

Questions

- 1.** The room temperature in an operating room (OR) should be

 - (A) below 50°F
 - (B) below 60°F
 - (C) between 68°F and 76°F
 - (D) between 80°F and 86°F
- 2.** The most effective protection from the radiation of X-rays is a

 - (A) lead apron
 - (B) double-thick muslin apron
 - (C) 3-feet distance from machine
 - (D) 3-feet distance from patient
- 3.** It is considered good technique to

 - (A) change the mask only if it becomes moistened
 - (B) hang the mask around the neck
 - (C) crisscross the strings over the head
 - (D) handle the mask only by the strings

4. Electrical cords should be

- (A) removed from outlets by the cord
- (B) wrapped tightly around equipment
- (C) removed from pathways so equipment is not rolled over them
- (D) disconnected from the unit before disconnection from the wall

5. Scatter radiation effects are directly related to

- (A) amount of radiation
- (B) length of exposure
- (C) accumulation of radioactive substances in operating room (OR)
- (D) amount of radiation and length of exposure time

6. Room temperature for infants and children should be maintained as warm as

- (A) 70°F
- (B) 80°F
- (C) 85°F
- (D) 95°F

7. Areas needing special cleaning attention on a weekly or monthly routine would include

- (A) furniture
- (B) air-conditioning grills and walls
- (C) ceiling and wall-mounted fixtures and tracks
- (D) kick buckets

8. A glass suction bottle should ideally be

- (A) rinsed with tap water between each case
- (B) cleaned with a disinfectant solution and autoclaved before reuse
- (C) rinsed with sterile distilled water between each case
- (D) autoclaved daily

9. Storage shelves must be cleaned with a germicide

- (A) each case
- (B) each day
- (C) each week
- (D) each month

10. While a surgical case is in progress

- (A) doors remain open so that staff can easily move in or out
- (B) doors should remain closed
- (C) doors remain open to circulate air
- (D) doors may be opened or closed

11. When cleaning the floor between cases

- (A) a clean mop head must be used each time
- (B) a two-bucket system, one detergent and one clear water, is used
- (C) buckets must be emptied and cleaned between each case
- (D) All of the above

12. A dropped sterile item may only be used if the

- (A) wrapper is muslin
- (B) wrapper is impervious and the contact area is dry
- (C) wrapper is impervious with the contact area wet or dry
- (D) wrapper is dusted off thoroughly

13. The following comply with protocol for protective eyewear EXCEPT

- (A) Impervious face shields can be worn
- (B) Goggles can be worn
- (C) Prescribe eyeglasses
- (D) All eye covers must extend from the front to the side

14. What statement regarding OR attire applies?

- (A) Head caps and hoods must be worn to reduce contamination from hair and dander to the field
- (B) Long sleeve, nonsterile cover jackets are worn by nonsterile personnel to prevent contamination by bacterial shedding of their arms
- (C) The scrub suit is worn by both sterile and nonsterile personnel
- (D) All of the above

15. All are true in preparing nonsterile equipment EXCEPT

- (A) Make sure the OR table is positioned directly under surgical lights
- (B) Arrange the room according to how the surgical tech likes it
- (C) Place furniture so that draped sterile tables are no closer than 12–18 inches to a nonsterile surface.
- (D) Pretest suction lines for adequate pressure

16. All are recommendations for opening a case EXCEPT

- (A) When opening packages sealed with tape, break the tape rather than tearing it
- (B) Open the scrub gown on to the back table
- (C) Never unwrap a heavy item while holding it in mid air
- (D) When opening instruments in closed sterilization

trays, break the seal and lift top straight up and away from the tray

Answers and Explanations

- 1. (C)** Room temperature is maintained within a range of 68°F–76°F (Fortunato).
- 2. (A)** Lead-lined aprons should be worn to protect the staff from radiation, especially during the use of an image intensifier. Thyroid collars are also particularly useful for protection (Fortunato).
- 3. (D)** Masks should be handled only by the strings, thereby keeping the facial area of the mask clean. The mask should never be worn around the neck. Upper strings are tied at the top of the head; lower strings are tied behind the neck because crisscrossing distorts mask contours and makes the mask less efficient (Fortunato).
- 4. (C)** Electrical cords should not be kinked, curled, or tightly wrapped. They should be handled by the plug, not the cord, when disconnecting. Always remove cords from pathways before rolling in equipment because this can break the cord (Meeker and Rothrock).

- 5. (D)** The effect of radiation is directly related to the amount and length of time of exposure. Exposure is cumulative (Fortunato).
- 6. (C)** Infants and children are kept warm to minimize heat loss and prevent hypothermia, 85°F should be maintained (Fortunato).
- 7. (B)** Ceiling- and wall-mounted fixtures are cleaned daily. Walls are spot cleaned as necessary but should be regularly cleaned along with air-conditioning grills. All furniture, room equipment, floors, and waste receptacles are cleaned between cases and at the end of the day (Fortunato).
- 8. (B)** Glass suction bottles should be thoroughly cleaned with a disinfectant solution and auto-claved before reuse (Fortunato).
- 9. (C)** Storage areas should be cleaned at least weekly to control dust (Fortunato).
- 10. (B)** Doors should be closed during and in between cases to reduce the microbial count (Fortunato).
- 11. (D)** A wet vacuum system is the best. However, if mopping is to be utilized, a clean mop is used. Each time the mop is used, a two-bucket system is

recommended (detergent germicide and clear water), and the buckets must be emptied and cleaned between uses (Fortunato).

12. (B) If a sterile package wrapped in a pervious muslin or other woven material drops to the floor or unclean area, do not use it. If the wrapper is impervious and contact area is dry, the item may be used. Dropped packages should not be put back into sterile storage (Fortunato).

13. (C) Protocol for the eyes say eyes must be covered from the brow to the top of the surgical mask and must extend over the temples (Fuller).

14. (D) All of the above statements are true (Fuller).

15. (B) OR furniture should be arranged in a manner that prevents contamination of sterile surfaces by traffic and by nonsterile equipment and also to prevent clutter (Fuller).

16. (B) The scrub person's gown and gloves should be opened on a small table or Mayo stand not back table (Fuller).

SECTION III
Concepts of Patient Care

CHAPTER 8

Transportation and Positioning

Questions

Transportation

- 1.** When using a patient roller, how many people are necessary to move the patient safely and efficiently?

 - (A) Two
 - (B) Three
 - (C) Four
 - (D) Five
- 2.** When moving the patient from the operating room (OR) table, who is responsible for guarding the head and neck from injury?

 - (A) Circulating nurse
 - (B) Scrub nurse
 - (C) Anesthesiologist
 - (D) Surgical technician
- 3.** To move the patient from the transport stretcher to the OR table,

- (A) one person stands at the head, one at the foot, while the patient moves over
- (B) one person stands next to the stretcher, one adjacent to the OR table, while the patient moves over
- (C) one person stands next to the stretcher, stabilizing it against the OR table, while the patient moves over
- (D) one person may stand next to the OR table and guide the patient toward him if stretcher wheels are locked

4. When moving a patient with a fracture in the OR, all of the following are true EXCEPT

- (A) extra personnel are necessary
- (B) support of the extremity should always be from below the site of fracture
- (C) lifters on the affected side support the fracture
- (D) the surgeon should be present

5. Which statement is false regarding the position on the OR table?

- (A) Elbow should not rest against the metal table
- (B) Feet should be uncrossed
- (C) Pillows provide support and comfort to prevent strain
- (D) Safety strap is 4 inches below the knee

6. To avoid compromising the venous circulation, the restraint or safety strap should be placed

- (A) at knee level
- (B) at the mid thigh area
- (C) 2 inches above the knee
- (D) 2 inches below the knee

7. A patient with a fractured femur is being moved to the OR table. Who is responsible for supporting and protecting the fracture site?

- (A) The nurse assistant
- (B) The physician
- (C) The circulating nurse
- (D) The scrub nurse

Positioning

8. Crossing the patient's arms across his or her chest may cause

- (A) pressure on the ulnar nerve
- (B) interference with circulation
- (C) postoperative discomfort
- (D) interference with respiration

9. A precaution always taken when the patient is in the

supine position is to

- (A) place the pillows under the knees for support
- (B) place the safety strap 3–4 inches below the knee
- (C) place the head in a headrest
- (D) protect the heels from pressure on the OR table

10. During lateral positioning, a

- (A) pillow is placed between the legs
- (B) sandbag is placed between the knees
- (C) rolled towel is placed under the bottom leg
- (D) sheet is folded flat between the legs

11. To prevent strain to the lumbosacral muscles and ligaments when the patient is in the lithotomy position,

- (A) the buttocks must not extend beyond the table edge
- (B) the legs must be placed symmetrically
- (C) the legs must be at equal height
- (D) a pillow should be placed under the sacral area

12. The lithotomy position requires each of the following EXCEPT

- (A) patient's buttocks rest along the break between the

body and leg sections of the table

(B) stirrups are at equal height on both sides of the table

(C) stirrups are at the appropriate height for the length of the patient's legs to maintain symmetry

(D) each leg is raised slowly and gently as it is grasped by the toes

13. All of the following are requirements of the Kraske position EXCEPT

(A) patient is prone with hips over the break of the table

(B) a pillow is placed under lower legs and ankles

(C) a padded knee strap is applied 2 inches above knees

(D) arms are tucked in at sides

14. When using an armboard, the most important measure is to

(A) support the arm at the intravenous site

(B) strap the patient's hand to it securely

(C) avoid hyperextension of the arm

(D) avoid hypoextension of the arm

15. Anesthetized patients should be moved slowly to

- (A) prevent fractures
- (B) prevent circulatory overload
- (C) allow the respiratory system to adjust
- (D) allow the circulatory system to adjust

16. If the patient is in a supine position, the circulator must always

- (A) place a pillow between the knees
- (B) place a pillow under the knees
- (C) see that the ankles and legs are not crossed
- (D) see that the thoracic area is padded adequately

17. Extreme positions of the head and arm can cause injury to the

- (A) cervical plexus
- (B) radial nerve
- (C) ulnar nerve
- (D) brachial plexus

18. Ulnar nerve damage could result from

- (A) poor placement of legs in stirrups
- (B) hyperextension of the arm
- (C) using mattress pads of varying thickness
- (D) placing an arm on an unpadded table edge

19. In the prone position, the thorax must be elevated from the OR table to prevent

- (A) compromised respiration
- (B) pressure areas
- (C) circulatory impairment
- (D) brachial nerve damage

20. The anesthesiologist closes the eyelids of a general anesthetic patient for all of the following reasons EXCEPT

- (A) prevent drying of the eye
- (B) prevent the patient from seeing the procedure
- (C) prevent eye trauma
- (D) protect the eye from anesthetic agents

21. Which position would be the most desirable for a pilonidal cystectomy or a hemorrhoidectomy?

- (A) Lithotomy
- (B) Kraske
- (C) Knee–chest
- (D) Modified prone

22. A position often used in cranial procedures is called

- (A) Fowler's

- (B) Kraske
- (C) Trendelenburg
- (D) lithotomy

23. In positioning for laminectomy, rolls or bolsters are placed

- (A) horizontally, one under the chest and one under the thighs
- (B) longitudinally to support the chest from axilla to hip
- (C) longitudinally to support the chest from sternum to hip
- (D) below the knees

24. The position used for a patient in hypovolemic shock is

- (A) modified Trendelenburg
- (B) reverse Trendelenburg
- (C) supine
- (D) dorsal recumbent

25. A Mayfield table would be used for which type of surgery?

- (A) Ophthalmic
- (B) Gynecologic

- (C) Neurologic
- (D) Urologic

26. Good exposure for thyroid surgery is ensured by all of the following EXCEPT

- (A) modified dorsal recumbent with shoulder roll
- (B) hyperextension of the neck
- (C) utilization of skin-stay sutures
- (D) firm retraction of the laryngeal nerve and surrounding structures

27. A procedure requiring the patient to be positioned supine in modified lithotomy is

- (A) colonoscopy
- (B) abdominoperineal resection (APR)
- (C) marsupilization of pilonidal cyst
- (D) ileostomy

28. In which procedure may the patient be placed in a supine position with the right side slightly elevated by a wedge to tilt the patient to the left?

- (A) Cerclage
- (B) Marsupilization of Bartholin's cyst
- (C) Shirodkar
- (D) Cesarean section

29. The position for most open bladder surgery would be

- (A) lithotomy
- (B) supine, bolster under pelvis
- (C) reverse Trendelenburg
- (D) Fowler's, modified

30. In which circumstance could the patient sustain injury to the pudendal nerves?

- (A) Positioned on the fracture table
- (B) Positioned in lateral chest
- (C) Positioned in lithotomy
- (D) Positioned on the urological table

31. Which factor is important to consider when positioning the aging patient?

- (A) Skeletal changes
- (B) Limited range of motion of joints
- (C) Tissue fragility
- (D) All of the above

32. When positioning the patient for a procedure, which of the following provides maximum patient safety and maximum surgical site exposure?

- (A) Patient's body does not touch metal on table

- (B) Equipment, Mayo stand, or personnel are not resting on the patient
- (C) Bony prominences are padded
- (D) All of the above

33. The changing a patient's position, can result in severe

- (A) hypotension
- (B) ischemia
- (C) elevated cerebral pressure
- (D) Both A and C

34. All are ways to identify a patient EXCEPT

- (A) address patient by their full name and state the surgery they are having
- (B) examine the patient's identification band and compare with the name and number on the chart
- (C) ask the patient to state their full name, do not call the patient by their name before asking
- (D) ask the patient to tell you what procedure they are having

35. To assist a falling patient, you should

- (A) support the patient's weight with your body
- (B) ease the patient to the floor while protecting their head

- (C) once the patient is down, run and get assistance
- (D) None of the above

36. Intravenous (IV) lines and fluids should be

- (A) lower than the patient's body
- (B) level with the patient's arm
- (C) higher than the patient's body
- (D) it really does not matter

37. What is the position called when the OR bed is tilted with feet down?

- (A) Trendelenberg
- (B) Low lithotomy
- (C) Hyperflexion
- (D) Reverse Trendelenberg

38. Antiembolism or sequential compression devices (SCDs) are placed on the patient's legs prior to surgery to prevent

- (A) thromboembolus
- (B) cramping
- (C) protection from metal parts of the OR table
- (D) to assist in the range of motion

39. Another name for the supine position is

- (A) prone
- (B) anteriolateral
- (C) dorsal recumbent
- (D) Trendelenberg

40. When the patient is positioned in supine position, the armboard must not be _____ more than degrees.

- (A) flexed, 90
- (B) there is no specific criteria
- (C) adducted, 90
- (D) abducted, 90

41. The position that allows greater access to the lower abdominal cavity and pelvic structures due to gravity is

- (A) reverse Trendelenberg
- (B) lithotomy
- (C) Trendelenberg
- (D) supine

42. The orthopedic fracture table provides

- (A) circumferential access
- (B) horizontal traction

- (C) exposure to the ankle
- (D) Both A and B

43. What position is occasionally used for facial, cranial, or reconstructive breast surgery?

- (A) Sims
- (B) Fowler's position
- (C) Reverse Trendelenberg
- (D) Anteriolateral

44. Another name for the jackknife position is

- (A) prone
- (B) posterolateral
- (C) Kraske
- (D) low lithotomy

45. Thoracic outlet syndrome can occur when there is pressure on

- (A) the thoracic artery
- (B) the brachial plexus
- (C) subclavian artery
- (D) Both B and C

46. Ulnar neuropathy results from

- (A) improper padding
- (B) continuous pressure from the edge of the OR table
- (C) when the elbow is tightly flexed
- (D) All of the above

47. The following is a risk when positioning the patient on the OR table:

- (A) hyperextension of limbs
- (B) pressure on bony prominences
- (C) improper padding
- (D) All of the above

48. When transferring an unconscious or immobile patient from the stretcher to the OR table, ideally how many people are required?

- (A) 2 or 3
- (B) 4to6
- (C) 1 or 2
- (D) None of the above

49. When removing a patient from lithotomy position

- (A) lower the legs separately
- (B) lower the legs quickly
- (C) lower the legs together
- (D) lower stirrups, then remove legs

Answers and Explanations

Transportation

- 1. (C)** Four people are needed to move the patient safely when using a roller. One lifts the head, one lifts the feet, one is beside the stretcher, and one is beside the OR table (Fortunato).
- 2. (C)** It is the responsibility of the anesthesiologist to guard the neck and head. It also puts him or her in a better position to observe the patient. Four people are needed, and the action must be synchronized (Fortunato).
- 3. (B)** There should be an adequate number of personnel to safely transfer the patient to the OR table. One person should stand next to the stretcher to stabilize it against the adjacent OR table. Another receives the patient from the opposite side of the table (Fortunato).
- 4. (B)** Fractures should be handled gently. Support should be both above and below the fracture site when moving the patient. Adequate personnel should be available. The lifters on the affected side support the

fracture site (Fortunato).

- 5. (D)** The safety strap is 2 inch above the knee, not too tight but secure (Association of Surgical Technologists).
- 6. (C)** The safety strap should be applied securely but loosely about 2 inch above the knee. This is to avoid compromise of venous circulation or pressure on bony prominences or nerves (Meeker and Rothrock).
- 7. (B)** The physician is responsible for supporting and protecting the fracture site when moving the orthopedic patient. A fracture is handled gently with support above and below the fracture site (Fortunato).

Positioning

- 8. (D)** Patient's arms should not be crossed on the chest in order to prevent hindrance of diaphragmatic movement and airway. This is essential to maintain respiratory function, to prevent hypoxia, and to facilitate inhalation anesthesia induction (Fortunato).
- 9. (D)** In the supine position, heels must be protected from pressure on the table by a pillow, ankle roll, or doughnut. The feet must not be in prolonged flexion; the soles are supported to prevent foot drop

(Fortunato).

- 10. (A)** When a patient is positioned on his or her side, a pillow is placed lengthwise between the legs to prevent pressure on blood vessels and nerves (Fortunato).
- 11. (A)** The buttocks should be even with the table edge but should not extend over the edge; otherwise, it could cause strain to the lumbosacral muscles and ligaments because the body weight rests on the sacrum (Fortunato).
- 12. (D)** Legs are raised simultaneously by two people who grasp the sole of a foot in one hand and support the knee area with the other. Stirrups must be of equal height and appropriate for the size of the patient's leg (Fortunato).
- 13. (D)** The requirements of the Kraske position are as follows: patient is prone with hips over break of table, wide armboard is under head of mattress to support arms, pillow is under lower legs and ankles, padded knee strap is 2 in above knees, table is flexed to acute angle, and small rolled towel is under each shoulder (Fortunato).

- 14. (C)** When using an armboard, caution should be taken so that the arm is not hyperextended or the infusion needle dislodged. Hyperextension can cause nerve damage (Fortunato).
- 15. (D)** The anesthetized patient and the elderly patient must be moved slowly and gently. This allows the circulatory system to adjust. This is for patient safety (Fortunato).
- 16. (C)** The patient must not have ankles or legs crossed as this could create pressure on blood vessels and nerves. A normal reaction is for a supine patient to cross his or her legs before going to sleep (Fortunato).
- 17. (D)** Injury to the brachial plexus can result from extreme positions of the head and arm. This can be avoided with proper care and careful observation (Fortunato).
- 18. (D)** Ulnar nerve damage can occur from pressure from the OR table edge. The arm resting on an unpadded surface places pressure on the ulnar nerve as it transverses the elbow. This can be prevented by the use of padding, by fastening the arm securely with a lift sheet, or by placing the arms on armboards

(Fortunato).

- 19. (A)** The thorax is elevated when the patient is in the prone position in order to facilitate respiration. This is accomplished with supports, rolls, elevating pads, body rests, or braces (Fortunato).
- 20. (B)** The patient's eyes may remain open even when the patient is under anesthesia. This exposes them to drying or trauma from drapes or instruments. They can be protected with ophthalmic ointment or taped closed (Fortunato).
- 21. (B)** The Kraske (jackknife) position is used for procedures in the rectal area such as pilonidal sinus or hemorrhoidectomy. Feet and toes are protected by a pillow. The head is to the side and the arms are on armboards (Fortunato).
- 22. (A)** In the Fowler's position the patient lies on his or her back with knees over the lower break in the table. A footboard is raised and padded. The foot of the table is lowered slightly, flexing the knees. The body section is raised. Arms rest on a pillow on the lap. This position is used in some cranial procedures with the head supported by a headrest (Fortunato).

- 23. (B)** The patient is in prone position with lumbar spine over the center break of the table; two laminectomy rolls (or other firm padding) are placed longitudinally to support the chest from axilla to hip. Additional padding protects bony prominences (Fortunato).
- 24. (A)** A modified Trendelenburg position is used for patients in hypovolemic shock. This may aid in venous return and cardiac output (Fortunato).
- 25. (C)** A Mayfield is a special neurosurgical overhead instrument table (Meeker and Rothrock).
- 26. (D)** The patient is in modified dorsal recumbent position with a rolled sheet to extend the neck and raise the shoulders. Skin flaps may be held away with stay sutures. The laryngeal nerve is identified and carefully preserved (Meeker and Rothrock).
- 27. (B)** For an abdominoperineal resection, the patient is initially positioned supine in modified lithotomy providing simultaneous exposure of both abdominal and perineal fields (Fortunato).
- 28. (D)** In a C-section, uterine displacement to the left in order to shift the uterus away from the pelvic vessels

is done to avoid maternal hypotension and maintain fetal well-being (Fortunato).

- 29. (B)** For most open bladder surgery, the patient is placed in the supine position with a bolster under the pelvis. Trendelenburg may be desired to allow viscera to fall toward the head, allowing excellent pelvic organ exposure (Meeker and Rothrock).
- 30. (A)** On the orthopedic fracture table, the patient is positioned supine with the pelvis stabilized against a well-padded vertical post. Pressure on the genitalia from the perineal post can injure the pudendal nerves (Meeker and Rothrock).
- 31. (D)** The aging patient's skin integrity is very important. Aging decreases range of motion of joints. Elderly people cannot fully extend the spine, neck, or upper and lower extremities. Pillows, padding, and support devices compensate for the skeletal changes to ensure patient comfort and ensure against postoperative pain or injury (Meeker and Rothrock).
- 32. (D)** Maximum patient safety is accomplished by padding all bony prominences, protecting the brachial plexus in the axillary region from strain or pressure,

ensuring that the legs are not crossed to prevent pressure on nerves and blood vessels, supporting and securing extremities to prevent them from falling off the bed, ensuring that no part of the patient's body touches metal on the OR bed, and making certain no equipment, Mayo, or personnel rests on the patient (Meeker and Rothrock).

33. (D) Changes in posture can result in hypotension and elevated cerebral pressure. Even when transfers are slow and deliberate, accidents can occur (Fuller).

34. (A) All are ways to identify a patient except addressing by their full name and stating the surgery they are having (Fuller).

35. (B) If a patient is walking unsteadily, you should use a wheelchair. If he or she is falling down, ease the patient to the floor while protecting their head, immediately call for assistance while remaining with the patient. Do not abandon the patient under any circumstances (Fuller).

36. (C) IV lines and fluids should always be higher than the patient's body (Fuller).

- 37. (D)** Reverse Trendelenberg or foot down position is used when the surgeon requires unobstructed access to the upper peritoneal cavity and the lower esophagus (Fuller).
- 38. (A)** SCDs reduce the risk of blood pooling or stasis and thrombus formation (Fuller).
- 39. (C)** Dorsal recumbent is also known as supine position (Fuller).
- 40. (D)** To protect the brachial plexus, armboards must not be abducted more than 90 degrees (Fuller).
- 41. (C)** Trendelenberg provides greater access to lower abdominal cavity and pelvic structures by allowing gravity to retract the organs (Fuller).
- 42. (D)** The fracture allows circumferential access and horizontal traction during the surgical procedure (Fuller).
- 43. (B)** The position used for facial, cranial, or reconstructive breast surgery is the Fowler's position (Fuller).

- 44. (C)** Jackknife is also known as Kraske. The patient is in the prone position with the table flexed downward to achieve simultaneous head down and foot down position (Fuller).
- 45. (D)** Thoracic outlet syndrome is a rare condition in which the brachial plexus and the subclavian artery are compressed (Fuller).
- 46. (D)** The ulnar nerve passes through the condylar groove of the elbow. It is only covered by skin and subcutaneous tissue. The nerve is subject to compression injury when the elbow is tightly flexed or there is direct pressure from the edge of the OR table (Fuller).
- 47. (D)** The patient can be seriously and permanently injured as a result of improper positioning. Only personnel specifically trained and competent to position the patient should assist in this task (Fuller).
- 48. (B)** Transferring the patient who is unable to control movement to the OR table requires 4–6 people (Fuller).
- 49. (C)** Sudden shifts in blood pressure and spinal injury

can occur during positioning and removal from stirrups. To prevent this injury, both legs must be lowered together slowly (Fuller).

CHAPTER 9

Observation

Questions

1. Diastolic blood pressure refers to

- (A) the force created by the contraction of the left ventricle of the heart
- (B) the relaxation phase between heartbeats
- (C) the first sound heard when taking the pressure on a manometer
- (D) the high point of the cycle

2. Systolic blood pressure represents

- (A) the pressure in the heart chambers, great vein, or close to the heart
- (B) the relaxation phase between heartbeats
- (C) the low point of the cycle
- (D) the greatest force caused by contraction of the left ventricle of the heart

3. Tachycardia is a/an

- (A) heartbeat over 100 beats per minute
- (B) irregular heartbeat

- (C) thready, weak heartbeat
- (D) heartbeat less than 60 beats per minute

4. The most common artery used to feel the pulse is the

- (A) dorsalis pedis artery
- (B) femoral artery
- (C) radial artery
- (D) carotid artery

5. The body temperature taken orally is 98.6°F.

What is it in Celsius?

- (A) 37°C
- (B) 52°C
- (C) 110°C
- (D) 212°C

6. Which term indicates low or decreased blood volume?

- (A) Anoxemia
- (B) Hypovolemia
- (C) Hypoxia
- (D) Hypocapnia

7. If the surgeon wants to assess the patient's ability to void voluntarily via the urethra, yet sees the need for urinary drainage, he could use a

- (A) Bonanno suprapubic catheter
- (B) Foley catheter
- (C) urethral stent
- (D) perineal urethrostomy

8. When catheterizing a patient

- (A) the patient must be shaved
- (B) the tip of the catheter must be kept sterile
- (C) sterile technique is not necessary
- (D) the bag must be maintained above table level

9. In which burn classification are the skin and subcutaneous tissue destroyed?

- (A) First
- (B) Second
- (C) Third
- (D) Fourth

10. Uncontrolled increased positive pressure in one side of the thorax causes collapse of the opposite side, which is called

- (A) flail chest
- (B) Cheyne–Stokes syndrome
- (C) emphysema

(D) mediastinal shift

11. Why is the obese patient at greater surgical risk than one of normal weight?

- (A) Fat has poor vascularity
- (B) Fluid and electrolyte balance is compromised
- (C) Kidney function is altered
- (D) Immune system lacks integrity

12. The patient has received preoperative medication. The action to be taken when this patient complains of dry mouth (thirst) and requests water would be to

- (A) provide the patient with unlimited water for thorough hydration
- (B) restrict water to 2 ounces
- (C) restrict fluids completely and explain the reason for action of medication
- (D) report to the surgeon immediately

13. When drawing a blood sample for arterial blood gases (ABGs), what is considered a safe time lapse between blood drawing and analysis?

- (A) 10 minutes
- (B) 20 minutes
- (C) 30 minutes

(D) 1 hour

14. A patient is on anticoagulant drugs. Which of the following tests may be done to check the clotting time of his or her blood?

- (A) Serum amylase
- (B) Complete blood count
- (C) Bleeding time
- (D) Prothrombin time

15. The preoperative urinalysis test done on a patient indicates that the specific gravity is 1.050. This

- (A) is within normal range
- (B) is below normal range and he or she is dehydrated
- (C) is above normal range and he or she is dehydrated
- (D) is indicative of sugar in the urine

16. A type and crossmatch is done

- (A) on all surgical patients
- (B) if the surgeon anticipates in advance of the operation that blood loss replacement may be necessary
- (C) on all hospital patients
- (D) in the OR

17. A patient scheduled for surgery has a hematocrit reading of 40% of whole blood volume. This is

- (A) within normal range
- (B) below normal range
- (C) above normal range
- (D) inconclusive

18. Inherited deficiencies of coagulation in which bleeding occurs spontaneously after minor trauma is

- (A) Tay–Sachs disease
- (B) hemophilia
- (C) pernicious anemia
- (D) erythroblastosis fetalis

19. Preoperative chest X-rays

- (A) are not necessary for the surgical patient
- (B) are necessary only for the thoracic surgical patient
- (C) are necessary only on the surgical patient with a chronic cough
- (D) should be done on all surgical patients

20. An electrocardiogram (ECG) is

- (A) an electrical recording of heart activity
- (B) an X-ray defining heart structures

- (C) an X-ray of the cardiac portion of the stomach
- (D) a stress test on the heart

21. After being scheduled in the OR for a routine tonsillectomy, the nurse checking the chart of a patient notes that the hemoglobin is 9.0 g. This reading is

- (A) within normal range
- (B) below normal range
- (C) above normal range
- (D) inconclusive

22. A microscopic blood exam that estimates the percentages of each type of white cell is called a

- (A) red blood count
- (B) white blood count
- (C) differential blood count
- (D) blood grouping

23. Which procedure is NOT absolutely necessary in patient identification?

- (A) Identification by the anesthesiologist, who checks the wristband, chart, and operating schedule
- (B) Identification by the surgeon before administration of an anesthetic

- (C) Identification by the circulating nurse, who checks the wristband, chart, and operating schedule
- (D) Identification by the scrub nurse before the procedure begins

24. Operative records documenting all aspects of perioperative care are required by

- (A) JCHO
- (B) OSHA
- (C) ASTM
- (D) CDC

25. Vital signs include

- (A) temperature
- (B) blood pressure
- (C) pulse
- (D) All of the above

26. The electronic probe thermometer is primarily used for

- (A) oral
- (B) axillary
- (C) rectal
- (D) Both A and B

27. What artery is most often used to access a patients pulse?

- (A) Carotid
- (B) Radial
- (C) Brachial
- (D) Apical

28. Sphygmomanometer is used to

- (A) measure pulse rate
- (B) measure cardiac output
- (C) measure blood pressure
- (D) palpate the carotid artery

Answers and Explanations

- 1. (B)** Diastolic blood pressure is that which exists during the relaxation phase between heartbeats. It is the point at which sound is no longer heard. Normal is about 80 (Fortunato).
- 2. (D)** Systolic blood pressure occurs when a great force is caused by contraction of the left ventricle of the heart. The first sound heard is recorded as the systolic pressure (Fortunato).
- 3. (A)** Tachycardia is excessive rapidity of heart action. The pulse rate is over 100 beats per minute. Some of the most common causes are exercise, anxiety, fever, and shock (Fortunato).
- 4. (C)** The radial artery, at the wrist, is the most commonly used to feel the pulse (Tortora and Grabowski).
- 5. (A)** To convert Fahrenheit to Celsius, subtract 32 from the number of Fahrenheit degrees and multiply the difference by $5/9$, as $98.6^{\circ}\text{F} - 32.0 = 66.6 \times 5/9 = 37^{\circ}\text{C}$ (Mosby's Medical, Nursing and Allied Health

Dictionary, 5th ed.).

- 6. (B)** Hypovolemia means low or decreased blood volume. Hypovolemic shock is caused by a decrease in circulating blood volume from loss of blood, plasma, or extracellular fluid. It is reversed by prompt restoration of blood volume via a transfusion of whole blood or other IV fluid or plasma expander (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 7. (A)** A suprapubic catheter (Bonanno) can be used if the bladder or urethra is injured, after some surgeries of the bladder, prostate, or urethra, or when assessment is desirable regarding voluntary voiding and maintenance of urethral function and tone (Fortunato).
- 8. (B)** Urinary catheterization requires sterile technique because contamination can lead to urinary tract infection. The drainage bag is always maintained below the table level. This prevents contamination by retrograde or backward flow of urine (Fortunato).
- 9. (C)** In a third-degree burn, the skin with all its epithelial structures and subcutaneous tissue are destroyed. These burns require skin graft for healing to occur (Fortunato).

- 10. (D)** Referred to as mediastinal shift, this reaction attends entrance of either air or fluid to the pleural cavity, compressing the opposite lung and causing dyspnea (Fortunato).
- 11. (A)** Fat is the tissue most vulnerable to trauma and infection because of its poor vascularity. Good wound closure is difficult (Fortunato).
- 12. (C)** Oral intake is discontinued; usually the patient is NPO (nothing by mouth) for 8 hours preceding operation. This is done to prevent regurgitation or emesis and aspiration of contents. The preoperative medication contains an anti-cholinergic for inhibition of mucous secretions. The patient usually complains of dry mouth after their administration (Fortunato).
- 13. (A)** Blood samples should be sent to the laboratory immediately. If more than 10 minutes elapse between blood drawing and analysis, the analysis cannot be considered accurate. In the event of delay, the syringe with blood should be immediately immersed in ice and refrigerated at near-freezing temperature (Fortunato).
- 14. (D)** A prothrombin time is a clotting time test used to

judge the effect of administration of anticoagulant drugs. It determines the time for clotting to occur after thromboplastin and calcium are added to decalcified plasma (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

15. (C) Specific gravity measures the density of particles in the urine, thus showing the concentrating or diluting powers of the kidneys. The normal range is from 1.010 to 1.025. A low specific gravity (under 1.010) may indicate poor renal function, with the kidneys unable to concentrate urine. A high specific gravity (over 1.025) may indicate a dehydrated state (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

16. (B) A type and crossmatch of blood is done if the surgeon anticipates that blood loss replacement may be necessary. In emergency situations, a sample of blood may be sent from the OR for immediate typing and crossmatching (Fortunato).

17. (A) The normal range hematocrit reading in males is between 43% and 49%; in females it is between 37% and 43% of whole blood volume. Hematocrit is the percentage of blood made up of RBCs (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th

ed.).

- 18. (B)** The effects of all types of hemophilia are so similar they are hardly distinguishable from one another, but each is a deficiency of a different blood-clotting factor. The most common type is hemophilia A (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 19. (D)** Even though chest disease is not related to the patient's surgery, most surgeons consider a chest X-ray an important part of a preoperative preparation. The X-ray rules out unsuspected pulmonary disease that could be communicable or would contraindicate the use of inhalation anesthetics (Fortunato).
- 20. (A)** Electrocardiogram is a graph of the electrical activity of the heart made with an ECG machine (Fortunato).
- 21. (B)** The hemoglobin concentration in the blood establishes the presence or absence of anemia (if low) or of polycythemia (if high). Values less than 14 g/100 mL in an adult male or less than 12 g/100 mL in an adult female would indicate anemia. A count above 18 g in either sex would indicate polycythemia.

Surgery would be delayed because bleeding is expected in tonsil surgery (Fortunato; Meeker and Rothrock).

22. (C) In a differential blood count, the varieties of leukocytes and their percentages are estimated. It is a microscopic exam of a very thin layer of blood on a glass slide that has been stained (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).

23. (D) The circulating nurse and anesthesiologist always check the label identifying the patient and surgeon; they also check the patient's chart and the operating schedule. The surgeon sees the patient before anesthetic agents are administered (Fortunato).

24. (A) The Joint Commission on Accreditation of Healthcare Organizations (JCHO) requires that a record be kept of each operation (preoperative diagnosis, description, specimens, postoperative diagnosis, names of participants, and the intraoperative case record) (Meeker and Rothrock).

25. (D) Vital signs include temperature, blood pressure, and pulse (Fuller).

26. (D) The electronic probe thermometer is used for oral and axillary. Only a designated rectal probe can be used to measure rectal temperature (Fuller).

27. (B) The artery most often used to assess a patient's pulse is the radial artery (Fuller).

28. (C) Blood pressure is measured with an electronic or manual sphygmomanometer, which requires the use of a stethoscope (Fuller).

CHAPTER 10

Cardiopulmonary Resuscitation

Questions

- 1.** Except for endotracheal tube installation, basic life support (BLS) cannot be interrupted for more than

 - (A) 1 minute
 - (B) 2 to 3 minutes
 - (C) 5 seconds
 - (D) 30 seconds

- 2.** External cardiac compression

 - (A) restores and maintains oxygenation
 - (B) provides pulmonary ventilation
 - (C) provides oxygen to vital tissues
 - (D) provides peripheral pulse

- 3.** Which action is the responsibility of the scrub person during an intraoperative cardiopulmonary resuscitation (CPR) effort?

 - (A) Remain sterile, keep track of counted items, and assist as necessary
 - (B) Document all medications given and draw up as

necessary

(C) Start time clock, guard sterile field

(D) Bring defibrillator into the room and reposition the patient

4. Brain damage may occur as quickly as _____ after circulatory collapse.

(A) 3 minutes

(B) 2 minutes

(C) 1 minute

(D) 30 seconds

5. Hands only CPR is not recommended for victims of

(A) drowning

(B) trauma

(C) airway obstruction

(D) All of the above

6. Rescuers should do chest compressions at a rate of per _____ minute.

(A) 50

(B) 100

(C) 75

(D) None of the above

7. During two rescuer CPR, the compression/ventilation rate for a child is

- (A) 30:2
- (B) 15:2
- (C) 10:2
- (D) 20:2

Answers and Explanations

- 1. (C)** Basic life support (BLS) should not be interrupted for more than 5 seconds at a time except for endotracheal intubation. If intubation is difficult, the patient must be ventilated between short attempts, and CPR should never be suspended for more than 30 seconds (Fortunato).
- 2. (C)** External, cardiac compression maintains circulation, which provides oxygen to vital body tissues and keeps them viable. It also preserves cardiac tone and reflexes and prevents intravascular clotting. It is the rhythmic application of pressure that compresses the ventricles (Fortunato).
- 3. (A)** The scrub person remains sterile, guards the sterile field, covers and packs incision, keeps counts, and gives attention to field and surgeon's needs. The other jobs are done by the circulator or additional personnel (Fortunato).
- 4. (A)** Brain damage may occur as quickly as 3 minutes following circulatory collapse (Fuller).

- 5. (D)** Hands only CPR is not recommended for drowning, trauma, airway obstruction, acute respiratory distress, and apnea American Heart Association.
- 6. (B)** This compression rate should produce adequate blood flow and improve survival American Heart Association.
- 7. (B)** Two rescuers should use a compression/ventilation ratio of 15 compressions to 2 breaths when giving CPR to children and infants American Heart Association.

CHAPTER 11

Medical, Ethical, and Legal Responsibilities

Questions

- 1.** A patient was burned on the lip with a hot mouth gag. Which of the following actions would have prevented this incident?

 - (A) The circulator cooled the item in the sterilizer
 - (B) The scrub nurse warned the surgeon that the item was hot
 - (C) The scrub nurse cooled the item in a basin with sterile water
 - (D) The surgeon had checked the item before using it
- 2.** A patient signs a permission form for surgery, but because of a language barrier he or she does not fully understand what she or he has signed. This could constitute a liability case for

 - (A) assault and battery
 - (B) lack of accountability
 - (C) improper documentation
 - (D) invasion of privacy
- 3.** If a patient falls because he or she was left unattended,

the OR team member could be cited in a lawsuit for

- (A) misconduct
- (B) assault
- (C) doctrine of Respondeat Superior
- (D) abandonment

4. The legal doctrine that mandates every professional nurse and technician to carry out their duties according to national standards of care practiced throughout the country is the

- (A) doctrine of Res ipsa Loquitor
- (B) doctrine of Respondeat Superior
- (C) Nurse Practice Act
- (D) doctrine of Reasonable Man

5. The doctrine of Respondeat Superior refers to

- (A) the legal terms for assault and battery
- (B) invasion of privacy
- (C) employer liability for employee's negligent conduct
- (D) professional misconduct

6. Liability is a legal rule that

- (A) applies only in criminal actions

- (B) holds the hospital responsible for its personnel
- (C) holds each individual responsible for his or her own acts
- (D) has no significance in malpractice suits

7. A criteria that identifies, measures, monitors, and evaluates patient care is

- (A) audits
- (B) automated information systems
- (C) quality control circles
- (D) quality assurance programs

8. Failing to observe or act in a situation that the individual should have known about and acted on is called

- (A) negligence
- (B) abandonment
- (C) guilt
- (D) defamation

9. A document which a person gives instructions about his or her medical care in the event that the individual cannot speak is

- (A) hospital policy
- (B) administrative law

- (C) ethical deposition
- (D) advanced directive

10. The legal document signed by the patient before surgery is

- (A) operative report
- (B) safe medical act
- (C) ethical policy
- (D) informed consent

11. The operative paperwork completed by the RN contains

- (A) sponges, sharps, and instrument counts
- (B) specimens
- (C) medications given
- (D) All of the above

12. The Latin phrase “aeger primo” refers to

- (A) patient first
- (B) do no harm
- (C) breathe
- (D) it speaks for itself

13. Events requiring an incident report include

- (A) bullying
- (B) equipment failure
- (C) incorrect count
- (D) All of the above

14. Accreditation for surgical technology programs is

- (A) ARC/STSA
- (B) CAAHEP
- (C) AORN
- (D) JACHO

15. The code of ethics of the Association of Surgical Technologists include:

- (A) to follow the principles of asepsis
- (B) to report any unethical conduct or practice to proper authorities
- (C) to respect and practice the patients legal and moral rights for quality patient care
- (D) All of the above

Answers and Explanations

- 1. (C)** It is the responsibility of the scrub nurse to cool an instrument in cool sterile water before handing it to the surgeon. Burns are one of the most frequent causes of lawsuits (Fortunato).
- 2. (A)** Lack of consent is an aspect of assault and battery. Consent must be given voluntarily with full understanding of the implications. The procedure must be explained fully, in understandable language, so that the patient fully comprehends what will be done (Fortunato).
- 3. (D)** Abandonment may be a cause for a lawsuit if an unattended patient falls from a stretcher or an OR table. It is the responsibility of a staff member to stay with the patient at all times (Fortunato).
- 4. (D)** The Doctrine of Reasonable Man means that a patient has the right to expect all professional and technical nursing personnel to utilize knowledge, skill, and judgment in performing duties that meet the standards exercised by other reasonable, prudent persons involved in a similar circumstance

(Fortunato).

- 5. (C)** An employer may be liable for an employee's negligent conduct under the Respondeat Superior master–servant employment relationship. This implies that the master will answer for the acts of the servant (Fortunato).
- 6. (C)** An unconditional general rule of law is that every person is liable for the wrongs he or she commits that cause injury, loss, or damage to any person's property. Liability means to be legally bound, answerable, and responsible. A patient or family member may institute a civil action against the person who caused the injury, loss, or damage (Fortunato).
- 7. (D)** Quality Assurance (QA) establishes the criteria for measuring, monitoring, and evaluating patient care as well as setting standards for improvement (Fortunato).
- 8. (A)** Negligence is legally defined as “the omission to do something which a reasonable person, guided by those ordinary considerations which regulate human affairs, would do, or do something which a reasonable and prudent person would not do (Fuller).
- 9. (D)** An advanced directive is a document giving someone instructions pertaining to medical care in the

event the person cannot make decisions on their own (Fuller).

- 10. (D)** Informed consent is a legal document that states the patient procedure, risks, consequences, and benefits of the surgery (Fuller).
- 11. (D)** This paperwork includes patient assessment, care plan, equipment, and devices used during the procedure. It counts specimens, medications, and the names of all perioperative personnel who participated in the procedure (Fuller).
- 12. (A)** The Latin term “aeger primo” means patient first (Fuller).
- 13. (D)** Many events require an incident report. Not just incorrect counts. They also include medication errors, bullying, equipment failure as well as incorrect counts (Fuller).
- 14. (B)** CAAHEP accredits programs upon recommendation of the ARC/STSA. The ARC/STSA provides educational standards and recommendations required for the accredited program of surgical technology and surgical first assisting (Fuller).

15. (D) All of the above are part of the code of ethics and many more (Fuller).

CHAPTER 12

Occupational Hazards

Questions

- 1.** Excessive exposure to radiation can affect the

 - (A) integumentary system
 - (B) brain
 - (C) reproductive organs
 - (D) stomach
- 2.** Radiation exposure of the staff is monitored with

 - (A) a homing device
 - (B) a Holter monitor
 - (C) film badges
 - (D) a notation on each operative record
- 3.** Ionizing radiation protection is afforded by the use of

 - (A) iron
 - (B) ebonized coating
 - (C) zinc
 - (D) lead
- 4.** A potential safety hazard associated with laser surgery

is

- (A) eye injury
- (B) electrical shock
- (C) carcinogenic activity
- (D) ionizing radiation exposure

5. An OR hazard that has been linked to increased risk of spontaneous abortion in female OR employees is exposure to

- (A) X-ray control
- (B) radium
- (C) sterilization agents
- (D) waste anesthetic gas

6. While using this mixture, a scavenging system is used to collect and exhaust or absorb its vapors. It is called

- (A) glutaraldehyde
- (B) polypropylene
- (C) methyl methacrylate
- (D) halon

7. The best measure for staff protection against HIV is

- (A) handling all needles and sharps carefully
- (B) using barriers to avoid direct contact with blood

and body fluids

(C) immunization of all staff with vaccine

(D) Both A and B

8. Which body organ is most susceptible to laser injury?

(A) Skin

(B) Gonads

(C) Eye

(D) Thyroid

9. How is inhalation of the laser plume best prevented?

(A) Double mask worn by scrub team

(B) Filter on suction

(C) Laser on standby whenever possible

(D) Mechanical smoke evacuator on field

10. What components are required for a fire and are found in an OR setting?

(A) O₂

(B) Fuel

(C) Source of ignition

(D) All of the above

11. Fuel sources found at the surgical site include

- (A) dry sponges and drapes
- (B) endotracheal tube
- (C) prep solvents
- (D) All of the above

12. STSR should _____ to prevent buildup of heat created by friction.

- (A) have suction available to remove smoke plume
- (B) check all equipment before cases begin
- (C) irrigate the active tip (high-speed drills)
- (D) do not lay the fiber optic cord directly on the drape

13. A hospital fire plan is based on four immediate actions remembered by the acronym:

- (A) PASS
- (B) CODE
- (C) OFSI
- (D) RACE

14. To activate a fire extinguisher, what will be the correct order of the following: (1) sweep, (2) aim, (3) squeeze, (4) pull?

- (A) 1, 2, 3, 4
- (B) 3, 2, 1, 4

- (C) 4, 2, 3, 1
- (D) 4, 3, 2, 1

15. The preferred type of fire extinguisher used for operating room fires is

- (A) water based
- (B) CO₂
- (C) dry powder
- (D) oil based

16. When an MRI is used, the primary risk to the patient is the presence of

- (A) CO₂
- (B) O₂
- (C) metal
- (D) None of the above

17. Harmful toxins created during laser surgery and electrosurgery come in the form of

- (A) heat
- (B) smoke plume
- (C) anesthesia
- (D) None of the above

18. Another name for a “no hands” technique is

- (A) retractable scalpel
- (B) blunt trocars
- (C) Hassan
- (D) neutral zone

19. Sources of latex include

- (A) wound drain
- (B) catheters
- (C) pneumatic tourniquet
- (D) All of the above

Answers and Explanations

- 1. (C)** Exposure to radiation can cause genetic changes, cancer, cataracts, injury to bone marrow, burns, tissue necrosis, and spontaneous abortion and congenital anomalies (Fortunato).
- 2. (C)** Film badges are the most widely used monitors measuring total rems of accumulated exposure. Data are reviewed (Fortunato).
- 3. (D)** Shielding with lead is the most effective protection against gamma rays and X-rays in the form of lead-lined walls, portable lead screens, lead aprons, lead-impregnated rubber gloves, lead thyroid–sternal collars, and lead glasses (Fortunato).
- 4. (A)** Eye and skin exposure must be avoided. Fire must be prevented. Avoid inhalation of laser plume. Ionizing radiation is from X-ray exposure (Fortunato).
- 5. (D)** Waste anesthetic gas is gas and vapor that escape from the anesthesia machine and equipment, as well as gas released through the patient's expiration. The hazards to personnel include an increased risk of

spontaneous abortion in females working in the OR, congenital abnormalities in their children as well as in the offspring of unexposed partners of exposed male personnel, cancer in females administering anesthesia, and hepatic and renal disease in both males and females. This problem can be reduced by a scavenging system that removes waste gases (Fortunato).

- 6. (C)** Methyl methacrylate, bone cement, is mixed at the sterile field. Vapors are irritating to eyes and respiratory tract. It may be a mutagen, a carcinogen, or toxic to the liver. It can cause allergic dermatitis. A scavenging system is used to collect vapor during mixing and exhaust it to the outside or absorb it through activated charcoal (Fortunato).
- 7. (D)** A patient may come to the OR infected but may not yet test positive. Careful handling of needles and sharps and using barriers to avoid direct contact with blood and body fluids are the best measures to prevent transmission. A vaccine has not been developed for immunization (Fortunato).
- 8. (C)** The eye is the organ most susceptible to laser injury. Safety goggles should be worn at all times when the laser is in use. The patient's eyes must also be protected (Fortunato).

- 9. (D)** A mechanical smoke evacuator or suction with a high-efficiency filter removes toxic substances including carcinogens and viruses from the air. Personnel should not inhale the fumes (Fortunato).
- 10. (D)** Fire requires three components. Oxygen available in the air or as in a pure gas, fuel, combustible material, and a source of ignition usually in the form of heat (Fuller).
- 11. (D)** Any material capable of burning is a potential fuel for fire (Fuller).
- 12. (C)** When high-speed instruments are used such as drills and saws, the active tip should be irrigated to prevent buildup of heat created by friction (Fuller).
- 13. (D)** RACE means rescue, alert, contain, and evacuate (Fuller).
- 14. (C)** These steps can easily be remembered by the acronym PASS (Fuller).
- 15. (B)** The preferred type of fire extinguisher used in operating rooms is CO₂ (Fuller).

- 16. (C)** Whenever an MRI is used, the primary risk to the patient is the presence of metal. It can be drawn from its source and into the path of the powerful magnetic field (Fuller).
- 17. (B)** Smoke plume is created during laser and electrosurgery. It contains harmful toxins that must be removed from the immediate surgical environment (Fuller).
- 18. (D)** This technique uses a hands free space (designated receptacle) on the sterile field where sharps can be placed and retrieved so that the surgical technologist and the surgeon do not hand instruments directly to each other (Fuller).
- 19. (D)** All of the above are sources of latex (Fuller).

SECTION IV

Preoperative Preparation

CHAPTER 13

Consents

Questions

1. In the event that a child needs emergency surgery, and the parents cannot be located to sign the permission

- (A) no permission is necessary
- (B) permission is signed by a court of law
- (C) permission is signed by the physician
- (D) a written consultation by two physicians other than the surgeon will suffice

2. The patient is scheduled for an appendectomy. After completing this procedure, the surgeon decides to remove a mole from the shoulder while the patient is still under anesthesia. No permission was obtained for this. The circulating nurse should

- (A) report it to the anesthesiologist
- (B) report it to the chief of surgery
- (C) report it to the supervisor or proper administrative authority
- (D) let the surgeon proceed because it is his or her responsibility to obtain the consent

3. The surgical consent form can be witnessed by each of the following EXCEPT

- (A) the surgeon
- (B) a nurse
- (C) an authorized hospital employee
- (D) the patient's spouse

4. The patient is premedicated and brought to the operating room (OR) for a cystoscopy and an open reduction of the wrist. Upon arrival in the OR, it is observed that the patient has only signed for the cystoscopy. The correct procedure would be to

- (A) cancel surgery until a valid permission can be obtained
- (B) have the patient sign for the additional procedure in the OR
- (C) ask the patient verbally for consent and have witnesses attest to it
- (D) let the surgeon make the decision as to whether surgery could be done

5. A general consent form is

- (A) a form authorizing all treatments or procedures
- (B) a form for all patients having general anesthesia
- (C) a form for all patients having hazardous therapy

(D) another name for an operative permit

6. The ultimate responsibility for obtaining consent lies with the

- (A) OR supervisor
- (B) circulating nurse
- (C) surgeon
- (D) unit charge nurse

7. The surgical consent is signed

- (A) before induction
- (B) in the holding area
- (C) the morning of surgery
- (D) before administration of preoperative medications

8. An informed consent

- (A) authorizes routine duties carried out at the hospital
- (B) protects patient from unratified or unwanted procedures
- (C) protects the surgeon and the hospital from claims of an unauthorized operation
- (D) Both B and C

9. Implied consent

- (A) is the preferred option for consents
- (B) is allowed by law in emergencies when no other authorized person may be contacted
- (C) is never legally valid
- (D) is the permission for surgical action

10. Which statement regarding the withdrawal of a consent by a patient is NOT true?

- (A) The surgeon informs the patient of the dangers if the procedure is not carried out
- (B) The surgeon informs the hospital administration of the patient's refusal
- (C) The surgeon obtains a written refusal from the patient
- (D) The surgeon may do the procedure if he documents that it is necessary as a lifesaving measure

11. Conditions of signing a consent form include

- (A) signed voluntarily
- (B) patient must be competent
- (C) patient must sign before preoperative medications are given
- (D) All of the above

12. Consents are required for

- (A) anesthesia
- (B) blood and blood products
- (C) experimental treatments
- (D) All of the above

Answers and Explanations

- 1. (D)** In a dire emergency, the patient's condition takes precedence over the permit. Permits may be accepted from a legal guardian or responsible relative. Two nurses should monitor a telephone consent and sign the form; it is then signed by the parent, guardian, or spouse upon arrival. A written consultation by two physicians, not including the surgeon, will suffice until the proper signature can be obtained (Fortunato).
- 2. (C)** If the surgeon intends or wants to perform a procedure not specified on the permission or consent form, the OR nurse assumes the responsibility of informing the surgeon and/or the proper administrative authority of the discrepancy (Fortunato).
- 3. (D)** The patient's (or suitable substitute's) signature must be witnessed by one or more authorized persons. They may be physicians, nurses, or other hospital employees authorized to do so. The witness is attesting to the proper identification of the patient and the fact that the signing was voluntary (Fortunato).

- 4. (A)** The patient giving his or her consent must be of legal age, mentally alert, and competent. The patient must sign before premedication is given and before going to the OR. This protects the patient from unratified procedures as well as protecting the surgeon and the hospital (Fortunato).
- 5. (A)** The general consent form authorizes the physician in charge and hospital staff to render such treatments or perform such procedures as the physician deems advisable. It applies only to routine hospital procedures. The consent document for any procedure possibly injurious to the patient should be signed before the procedure is performed (Fortunato).
- 6. (C)** The ultimate responsibility for obtaining permission is the surgeon's. The circulating nurse (RN or charge nurse) and the anesthesiologist are responsible for checking that the consent is on the chart, properly signed, and that the information on the form is correct (Fortunato).
- 7. (D)** All consent forms must be signed before the administration of preoperative medications. This is to ensure that the patient fully understands what the procedure is. If the permission is signed incorrectly, it may not be revised until the preoperative medication has worn off (Fortunato).

- 8. (D)** An informed consent (operative permit) protects the patient from unratified procedures and protects the surgeon and the hospital claims of an unauthorized operation. A general consent authorizes the physician and staff to render treatment and perform procedures which are routine duties normally carried out at the hospital (Fortunato).
- 9. (B)** Implied consent is never the preferred action. Law allows it in emergency situations when no other authorized person can be contacted or when conditions are discovered during a surgical procedure (Association of Surgical Technologists).
- 10. (D)** The patient has a right to withdraw written consent if it is voluntary and if he or she is in a rationale state. The surgeon explains consequences, obtains a written refusal and informs hospital and administration. The surgery is postponed (Fortunato).
- 11. (D)** All of the above are conditions for signing a consent (Fuller).
- 12. (D)** All of the above including placing central venous catheters and other vascular devices and patients undergoing elective sterilization process must sign written consent (Fuller).

CHAPTER 14

Skin Preparation and Draping

Questions

- 1.** The main purpose of the skin prep is to

 - (A) remove resident and transient flora
 - (B) remove dirt, oil, and microbes, and to reduce the microbial count
 - (C) remove all bacteria from the skin
 - (D) sterilize the patient's skin
- 2.** Which is the antiseptic solution of choice for a skin prep?

 - (A) Cipex
 - (B) Staphene
 - (C) Povidone–iodine
 - (D) Zephiran
- 3.** When preparing a patient for a breast biopsy, a breast scrub is either eliminated or done very gently because of

 - (A) patient anxiety
 - (B) dispersal of cancer cells

- (C) contamination
- (D) infection

4. The ideal place to do the shave prep is in the

- (A) patient's room
- (B) operating room (OR) suite
- (C) holding area of the OR
- (D) room where the surgery will be performed

5. Any area that is considered contaminated

- (A) should be scrubbed last or separately
- (B) should not be scrubbed at all
- (C) should be scrubbed first
- (D) needs no special consideration

6. In preparation for surgery, skin should be washed and painted

- (A) from the incision site to the periphery in a circular motion
- (B) from the periphery to the incision site in a circular motion
- (C) in a side-to-side motion
- (D) in an up-and-down motion

7. Preliminary preparation of the patient's skin begins

- (A) with a preoperative shower
- (B) with the shave preparation
- (C) in the OR
- (D) in the holding area

8. Suction tubing is attached to the drapes with a/an

- (A) towel clip
- (B) nonperforating clamp
- (C) Kocher clamp
- (D) Allis clamp

9. All of the following statements regarding sterility are true EXCEPT

- (A) wrapper edges are unsterile
- (B) instruments or sutures hanging over the table edge are discarded
- (C) sterile person pass each other back to back
- (D) a sterile person faces a nonsterile person when passing

10. When draping a table, the scrub nurse should drape

- (A) back to front
- (B) front to back
- (C) side to side

(D) Either A or B

11. A seamless, stretchable material often used to cover extremities during draping is

- (A) Esmarch
- (B) ace bandage
- (C) Kling
- (D) stockinette

12. Drapes are

- (A) adjusted after placement for correct position
- (B) unfolded before being carried to OR table
- (C) passed across the table to surgeon along with towel clips
- (D) placed on a dry area

13. Which statement demonstrates a break in technique during the draping process?

- (A) Gloved hands may touch the skin of the patient
- (B) Discard a drape that becomes contaminated
- (C) Discard a sheet that falls below table level
- (D) Cover or discard a drape that has a hole

14. A head drape consists of

- (A) medium sheet, towel, towel clip
- (B) two medium sheets, towel clip
- (C) one small sheet, one medium sheet, towel clip
- (D) towel, fenestrated sheet

15. When the scrub person is draping a nonsterile table, he or she must

- (A) cover the back edge of the table first
- (B) use a single-thickness drape
- (C) be sure the drape touches the floor
- (D) cuff the drape over his or her gloved hands

16. When covering a Mayo stand, the scrub person should

- (A) use a wide cuff
- (B) use no cuff
- (C) open the cover fully before placement
- (D) ask the circulator to pull on the cover

17. If a sterile field becomes moistened during a case

- (A) nothing can be done
- (B) extra drapes are added to area
- (C) the wet sections are removed and replaced with dry sections
- (D) the wet sections are covered with a plastic adherent drape

18. Which of the following actions by the scrub person is NOT an acceptable sterile technique principle?

- (A) Discarding tubing that falls below sterile field edges without touching the contaminated part
- (B) Reaching behind sterile team members to retrieve instruments so they do not collect on the patient
- (C) Facing sterile areas when passing them
- (D) Stepping away from the sterile field if contaminated

19. What antiseptic agent is safe for ophthalmic and in a face prep?

- (A) Alcohol
- (B) Betadine
- (C) Chlorahexadine
- (D) Triclosan

20. When prepping a contaminated such as a colostomy, the procedure includes:

- (A) Contaminated area is prepped first and covered with sterile gauze and clean prep sponges are used to clean surrounding area
- (B) Contaminated area is prepped first, clean sponges are used to prep the surrounding area
- (C) Prep the clean surrounding area first then with

clean sponges, prep the contaminated area
(D) All of the above can be done

21. Why should prep solutions dry before applying drapes?

- (A) To prevent strike through contamination
- (B) They stick better
- (C) It enhances the antiseptic effect
- (D) Does not stain the drapes

22. Risks associated with prep solutions pooling under a patient include:

- (A) Causes no harm to patient
- (B) Chemical burn
- (C) Blistering and skin loss
- (D) Both B and C

23. Betadine is categorized as a/an

- (A) alcohol
- (B) chlorhexidine gluconate
- (C) iodophor
- (D) sterilant

24. A prep that includes from the chin to the nipple line or the waist and around the side of the body to the OR

table on each side is indicated for what type of surgery?

- (A) Breast
- (B) Neck (radical)
- (C) Shoulder
- (D) All of the above

25. Rectal surgery prep is done:

- (A) Patient is prepped in supine then positioned in prone
- (B) Surrounding area is prepped first, anus last
- (C) Anus first, surrounding area last
- (D) Before the buttock tape is placed

26. During prepping and draping if the STSR contaminates their hand they should

- (A) finish draping and change
- (B) change glove immediately
- (C) remove all drapes and start over
- (D) do nothing, it does not matter

27. Drapes that are self-adhering and transparent and provide an impervious barrier over an incision are called

- (A) incise drapes
- (B) nonwoven drapes
- (C) fenestrated drapes
- (D) woven drape

28. Arrange the following procedure of removing drapes at the end of the procedure in proper order:

1. remove all instruments and equipment from sterile field
2. roll drapes from the head proceeding to the patients feet
3. place dressings and hold dressings in place while removing drapes
4. dispose of drapes in garbage

- (A) 1, 3, 2, 4
- (B) 1, 2, 3, 4
- (C) 2, 3, 4, 1
- (D) 2, 4, 1, 3

29. A sterile barrier between the face and head used in nose and throat procedures is a

- (A) fenestrated
- (B) self-adherent drape
- (C) head drape
- (D) incise drape

30. What is the body's primary defense against infection?

- (A) Hair
- (B) Skin
- (C) Proper prepping and draping
- (D) Good hygiene

31. The word "fenestrated" refers to

- (A) an opening
- (B) length of drape
- (C) width of drape
- (D) transparent

Answers and Explanations

- 1. (B)** Methods of skin prep may vary, but the objectives are the same—to remove dirt, oil, and microbes from the skin so the incision can be made through the skin with a minimal danger of infection. It also reduces the resident microbial count and prevents the growth of microbes (Meeker and Rothrock).
- 2. (C)** The current trend is toward a surgical scrub of antiseptic solution containing povidone–iodine. This reduces the number of bacteria on the skin and inhibits the growth. This process is eliminated in some ORs (Meeker and Rothrock).
- 3. (B)** When a breast is prepped for suspected malignancy, it is done gently or not at all. Scrubbing the breast with the usual amount of pressure could cause cancer cells to break loose from the lesion and spread the disease (Fortunato).
- 4. (C)** The patient should be shaved immediately before surgery, preferably in a holding area of the OR. This is thought to reduce the infection rate. The amount of time between the preoperative shave and the operation

has a direct effect on wound infection rate (Fortunato).

- 5. (A)** Contaminated areas (which can include draining sinuses, skin ulcers, vagina, or anus) should be scrubbed last or with separate sponges. This prevents dragging pathogens into the incisional area and, thus, reduces the possibility of infection (Fortunato).
- 6. (A)** Skin should be washed from the incision site to the periphery in a circular motion. This keeps the incision site cleaner and prevents wound contamination (Fortunato).
- 7. (A)** Patients may be advised to begin bathing with a 3% hexachlorophene solution before admission for an elective procedure. Patients should shower or be bathed before coming to the OR suite. This action is bacteriostatic and reduces microbial contamination (Fortunato).
- 8. (B)** Suction tubing is attached to the drapes with a nonperforating clamp (Fortunato).
- 9. (D)** A sterile person turns his or her back to a nonsterile person or area when passing (Fortunato).
- 10. (B)** When draping a table, open the drape toward the front of the table first. This establishes a sterile area

close to the scrub (Fortunato).

- 11. (D)** Stockinette may be used to cover an extremity. It is a seamless, stretchable tubing material which contours snugly to skin. It may be covered with plastic. Some has vinyl on outside layer (Fortunato).
- 12. (D)** Drapes are placed on a dry area. The scrub nurse takes towel clips and skin towels to the side of the OR table from which the surgeon will apply them. Folded drapes are carried to the OR table. Drapes are held high enough to avoid touching nonsterile areas. Once a drape is placed, it may not be adjusted (Fortunato).
- 13. (A)** B, C, and D are acceptable techniques. Gloved hands should not touch the skin of the patient. Protect gloved hands by cuffing end of sheet over them (Fortunato).
- 14. (A)** The surgeon places a drape under the head while the circulator holds up the head. This drape consists of a towel placed on a medium sheet. Center of towel edge is 2 inches in from center of sheet edge. Towel is drawn up on each side of face, over forehead or at hairline and fastened with a clip. Additional towels surround operative site (Fortunato).

- 15. (D)** In draping a nonsterile table, the scrub nurse should cuff the drape over his or her gloved hand in preparation for opening it. The side of the drape toward him or her is done first to minimize the possibility of contaminating the front of the gown (Fortunato).
- 16. (A)** A wide cuff is used on the Mayo cover to protect the gloved hands (Fortunato).
- 17. (B)** The table and sterile field should be kept as dry as possible. However, extra towels may be spread if a solution has soaked through a sterile drape (Fortunato).
- 18. (B)** Scrub persons should not reach behind a member of the sterile team. They may go around the person, passing back to back (Fortunato).
- 19. (D)** Triclosan is an antiseptic agent safe for ophthalmic use and in a face prep. The other agents are not safe for use on these areas (Fuller).
- 20. (C)** The clean area is prepped first and with clean sponges, the contaminated area is cleaned (Fuller).

- 21. (C)** Prep solutions should be dry prior to applying drapes in order to enhance the antiseptic effect.
- 22. (D)** Chemical burns result when prep solution is allowed to pool under the patient. Pressure and contact with the chemical over time can cause severe blistering and skin loss (Fuller).
- 23. (C)** Betadine is categorized as an iodophor (Fuller).
- 24. (B)** Prep for a neck procedure includes the chin to the nipple line to the waist and around the side of the body to the OR table on each side (Fuller).
- 25. (B)** The area is prepped cleanest to dirtiest areas (Fuller).
- 26. (B)** The STSR should change glove immediately (Fuller).
- 27. (A)** Incise drapes are self-adhering transparent and provide an impervious barrier over an incision (Fuller).
- 28. (A)** At the end of the procedure, the STSR should remove all instruments and equipment from sterile

field, place dressings on incision and hold with hand while removing drapes from head to toe and place in garbage (Fuller).

29. (C) A head drape is the sterile barrier between the face and head used during nose and throat procedures (Fuller).

30. (B) Skin is the body's primary defense against infection (Fuller).

31. (A) The word fenestrated refers to an "opening" in a drape (Fuller).

CHAPTER 15

Instruments

Questions

- 1.** A surgical treatment for scoliosis could employ the use of

 - (A) skeletal traction
 - (B) external fixation
 - (C) compression plate and screws
 - (D) Harrington rods

- 2.** During surgery, towel clips

 - (A) may be removed only by the circulator
 - (B) may not be removed once fastened
 - (C) may be removed and discarded as long as the area is covered with sterile linen
 - (D) may be removed and discarded from the field

- 3.** As grossly soiled instruments are returned to the scrub, they should be

 - (A) placed in a basin of sterile saline to soak off debris
 - (B) wiped off with a sponge moistened with water or

soaked in a basin of sterile distilled water

(C) wiped off with a dry sponge

(D) discarded so that the circulator can clean them thoroughly

4. The sterile component of the electrosurgical unit (ESU) is the

(A) grounding pad

(B) generator

(C) foot pedal

(D) active electrode

5. Deaver and Richardson retractors have an advantage over the Balfour and O'Connor/O'Sullivan retractors in that they provide

(A) less exposure

(B) less fatigue

(C) greater adjustability

(D) more fatigue

6. Which suction tip is meant to be used during abdominal surgery?

(A) Poole

(B) Yankauer

(C) Frasier

(D) Tonsil

7. What kind of retractor is generally used in areas near viable nerves or blood vessels?

- (A) Sharp rakes
- (B) Skin hooks
- (C) Dull rakes
- (D) Sharp weitlander

8. All of the following instruments have teeth EXCEPT

- (A) Allis
- (B) Heaney
- (C) Kocher
- (D) Babcock

9. All of the following are self-retaining retractors EXCEPT

- (A) O'Connor–O'Sullivan
- (B) Balfour
- (C) Weitlander
- (D) Richardson

10. What is the term that refers to separating tissue layers on a vertical plane using dissecting scissors?

- (A) Incision
- (B) Undermining
- (C) Transecting
- (D) Blunt dissection

11. The following surgeries do not require the use of a trocar EXCEPT for

- (A) laparoscopy
- (B) cystoscopy
- (C) proctoscopy
- (D) bronchoscopy

12. The safest method for loading a blade on a knife handle is to use

- (A) gloved hand
- (B) needleholder
- (C) mixer
- (D) adson forceps

13. What is a Lebsche used for?

- (A) Open the sternum
- (B) To retract spinal nerves
- (C) To elevate the periosteum
- (D) To separate the ribs

14. A rongeur used extensively in surgery of the spine and in neurosurgery is the

- (A) Adson
- (B) Cobb
- (C) Kerrison
- (D) Cloward

15. A rib retractor is a

- (A) Weitlaner
- (B) Finochietto
- (C) Harrington
- (D) Beckman

16. A Doyen is a

- (A) rib shears
- (B) rib cutter
- (C) rib spreader
- (D) rib raspator

17. The instrument used to enlarge the burr hole made during a craniotomy is a

- (A) rongeur
- (B) periosteal elevator
- (C) Gigli saw

(D) Cloward punch

18. Wescott scissors are used in

- (A) plastic surgery
- (B) ophthalmic surgery
- (C) vascular surgery
- (D) orthopedic surgery

19. The instrument used in a splenectomy is a

- (A) Doyen
- (B) Allen
- (C) Jacobs
- (D) pedicle clamp

20. Bowman probes are used in

- (A) common bile duct surgery
- (B) lacrimal surgery
- (C) kidney surgery
- (D) bladder surgery

21. A Hurd dissector and pillar retractor is used for

- (A) appendectomy
- (B) plastic surgery
- (C) nasal surgery

(D) tonsillectomy

22. The Lempert elevator is used in surgery of the

(A) eye

(B) nose

(C) ear

(D) bones

23. A Scoville retractor is used in a

(A) total knee replacement

(B) meniscectomy

(C) laminectomy

(D) carpal tunnel release

24. A Bailey is a

(A) clamp

(B) rongeur

(C) dissecting forceps

(D) rib approximator

25. A Sauerbruch is a/an

(A) elevator

(B) raspatory

(C) retractor

(D) rongeur

26. An Auvarad is a

- (A) forceps
- (B) dissector
- (C) speculum
- (D) sound

27. A Babcock is used to

- (A) grasp bone
- (B) grasp delicate structures
- (C) clamp vessels
- (D) retract soft tissue

28. Nasal cartilage is incised with a

- (A) Ballenger swivel knife
- (B) Freer elevator
- (C) Duckbill rongeur
- (D) Hurd dissector

29. A self-retaining retractor is a

- (A) Weitlaner
- (B) Lincoln
- (C) Hibbs

(D) Deaver

30. A rectal speculum is a

- (A) Percy
- (B) Hirshmann
- (C) Pennington
- (D) Hill

31. A small fine needle holder used in plastic surgery is a

- (A) Ryder
- (B) Heaney
- (C) Webster
- (D) Castroviejo

32. A kidney pedicle clamp is a

- (A) Lincoln
- (B) Herrick
- (C) Love
- (D) Little

33. Uterine dilators are

- (A) Hanks
- (B) Van Buren
- (C) Bakes

(D) Graves

34. A technique utilizing the insertion of a needle or wire through a needle in order to identify suspicious breast tissue is a/an

- (A) incisional biopsy
- (B) wire localization
- (C) Silverman needle biopsy
- (D) magnetic resonance imaging (MRI)

35. A forceps used to remove stones in biliary surgery is a

- (A) mixer
- (B) Lahey gall duct
- (C) Potts–Smith
- (D) Randall

36. Right-angled pedicle clamps would be found on a setup for

- (A) splenectomy
- (B) cholecystectomy
- (C) hemorrhoidectomy
- (D) thyroidectomy

37. Blunt nerve hooks are selected for a _____ setup.

- (A) vagotomy
- (B) colostomy
- (C) gastrojejunostomy
- (D) abdominal–perineal resection

38. In which procedural setup would a T-tube be found?

- (A) Exploration of the common bile duct
- (B) Cholecystectomy
- (C) Cholelithotripsy
- (D) Choledochoscopy

39. Stapedectomy requires all of the following items EXCEPT

- (A) small microsuction
- (B) speculum
- (C) prosthesis
- (D) autograft

40. Cochlear implants utilize an electrode device

- (A) to restore hearing
- (B) to aerate the mastoid
- (C) to allow drainage
- (D) to relieve vertigo

41. All of the following are required for repair of a nasal

fracture EXCEPT

- (A) bayonet forceps
- (B) Ballenger swivel knife
- (C) splint
- (D) Asch forceps

42. A forceps used in nasal surgery is a/an

- (A) bayonet
- (B) Russian
- (C) rat-tooth
- (D) alligator

43. All of the following instruments can be found on a nasal setup EXCEPT

- (A) Freer elevator
- (B) bayonet forceps
- (C) Potts forceps
- (D) Frazier suction tube

44. On which setup would bougies be found?

- (A) Tonsillectomy
- (B) Esophagoscopy
- (C) Radical neck
- (D) Parotidectomy

45. All of the following can be found on a tonsil-lectomy setup EXCEPT

- (A) Yankauer suction
- (B) Hurd dissector and pillar retractor
- (C) tongue depressor
- (D) Jameson hook

46. Tissue expanders are used in

- (A) augmentation mammoplasty
- (B) reduction for gynecomastia
- (C) transrectus myocutaneous flap
- (D) breast reconstruction

47. The fracture treated with arch bars is

- (A) nasal
- (B) mandibular
- (C) zygomatic
- (D) orbital

48. Rib removal for surgical exposure of the kidney requires all of the following EXCEPT a/an

- (A) Alexander periosteotome
- (B) Doyen raspatory
- (C) Heaney clamp

(D) Stille shears

49. Stone forceps on a kidney set are

(A) Lewkowitz

(B) Randall

(C) Satinsky

(D) Mayo

50. A Sarot is a

(A) bronchus clamp

(B) scapula retractor

(C) lung retractor

(D) lung grasping clamp

51. Which item would not be included on a setup for a transvenous (endocardial) pacemaker?

(A) Tunneling instrument

(B) Intra-aortic balloon pump

(C) Fluoroscopy

(D) Defibrillator

52. The most frequent conditions requiring the use of a permanent pacemaker are

(A) coronary or mitral insufficiency

- (B) pulmonary artery or vein stenosis
- (C) heart block, bradyarrhythmia
- (D) pulmonary stenosis, ventricular septal defect

53. Which setup would include distraction and compression components?

- (A) Harrington rods
- (B) Intramedullary nail
- (C) Arthrodesis
- (D) Tibial shaft fracture

54. Traction applied directly on bone via pins, wires, or tongs is

- (A) internal
- (B) closed
- (C) skeletal
- (D) counter pressure

55. Skeletal traction of a lower leg is accomplished with the use of a/an

- (A) Kirschner wire
- (B) Knowles pin
- (C) Eggers plate
- (D) Smith–Peterson nail

56. In orthopedic surgery, the viewing of the progression of a procedure on a television screen is known as

- (A) image intensification
- (B) radiography
- (C) portable filming
- (D) X-ray

57. A neurologic study in which a radiopaque substance is injected into the subarachnoid space through a lumbar puncture is called a/an

- (A) cerebral angiography
- (B) myelogram
- (C) encephalogram
- (D) diskogram

58. A neuro headrest skull clamp is called a/an

- (A) Sachs
- (B) Frazier
- (C) Adson
- (D) Mayfield

59. Maintenance of acceptable blood pressure and prevention of the development of air emboli in the neurosurgical patient can be effected by preoperative utilization of

- (A) an antigravity suit
- (B) Ace bandages
- (C) thrombo-embolic device (TED) stockings
- (D) adequate body support

60. Specialized instruments for a cleft lip repair would include

- (A) Cupid's bow
- (B) Logan's bow
- (C) arch bar
- (D) wire scissors

61. Cloward instrumentation would be included for surgery of the

- (A) hip
- (B) femur
- (C) cervical spine
- (D) lumbar spine

62. On which setup would a Beaver knife handle be found?

- (A) Orthopedic
- (B) Pediatric
- (C) Gynecologic

(D) Eye

63. Which procedure requires a sterile setup?

(A) Manual skin traction

(B) Skin traction

(C) Skeletal traction

(D) Closed reduction

64. A craniotomy may employ the use of a/an _____ for exposure.

(A) Mayfield

(B) Sugita

(C) Heifetz

(D) Leyla–Yasargil

65. On which setup would either a Pereyra or a Stamey needle be found?

(A) Urologic

(B) Eye

(C) Orthopedic

(D) Thoracic

66. Disintegration of kidney stones through a liquid medium is accomplished with a/an

- (A) nephroscope
- (B) extracorporeal shock wave lithotripter
- (C) laser
- (D) cystoscope

67. A urology perineal retractor system is called

- (A) Bookwalter
- (B) O'Sullivan–O'Conner
- (C) Omni–Tract
- (D) Lowsley

68. Which procedure would utilize a Mason–Judd retractor?

- (A) Bladder
- (B) Uterus
- (C) Hip
- (D) Nose

69. A Furlow inserter is used in

- (A) penile implantation
- (B) femoral–popliteal bypass
- (C) total hip replacement
- (D) intraocular lens (IOL) implant

70. A Millin is a/an

- (A) prostatic enucleator
- (B) urological needle holder
- (C) stone forceps
- (D) retropubic bladder retractor

71. Which setup would include a Gomco clamp?

- (A) Colostomy
- (B) Breast augmentation
- (C) Circumcision
- (D) Femoral popliteal bypass

72. In which surgical specialty would a Humi Cannula be used?

- (A) Gynecologic
- (B) Ophthalmic
- (C) Orthopedic
- (D) Vascular

73. An instrument used in laparoscopy to manipulate the uterus for increased structure visibility is the

- (A) Verres
- (B) Pratt
- (C) Mayo–Hegar
- (D) Hulka

74. A central venous pressure (CVP) catheter insertion requires

- (A) a sterile setup
- (B) a crash cart
- (C) an IV technician
- (D) None of the above

75. The purpose of a set of Bakes would be

- (A) anal dilation
- (B) esophageal dilation
- (C) common duct dilation
- (D) cervical dilation

76. A Steffee plate is a

- (A) shoulder replacement
- (B) knee joint replacement
- (C) femoral implant
- (D) spinal implant

77. Skeletal traction is accomplished with

- (A) Sayre sling
- (B) Minerva jacket
- (C) Crutchfield tongs
- (D) Steffee system

78. The Bookwalter is a _____ instrument.

- (A) clamping
- (B) holding
- (C) suturing
- (D) retracting

79. Which instrument is a retractor?

- (A) Harrington
- (B) Doyen
- (C) Crile
- (D) Allen

80. A long thoracic forceps is a

- (A) Semb
- (B) DeBakey
- (C) Sauerbruch
- (D) Doyen

81. A bougie is a

- (A) clamp
- (B) dilator
- (C) retractor
- (D) grasper

Questions 82 through 84: The following group of questions is preceded by a group of instrument images ([Figure 15-1](#)). For each question, select the one lettered option that is the best answer.

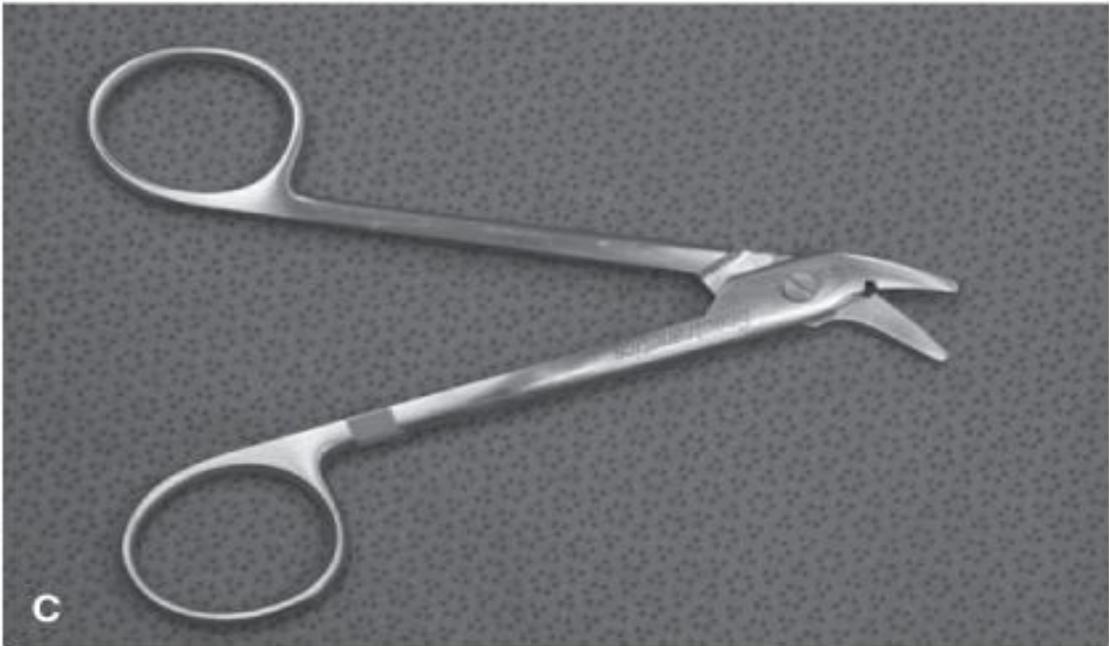
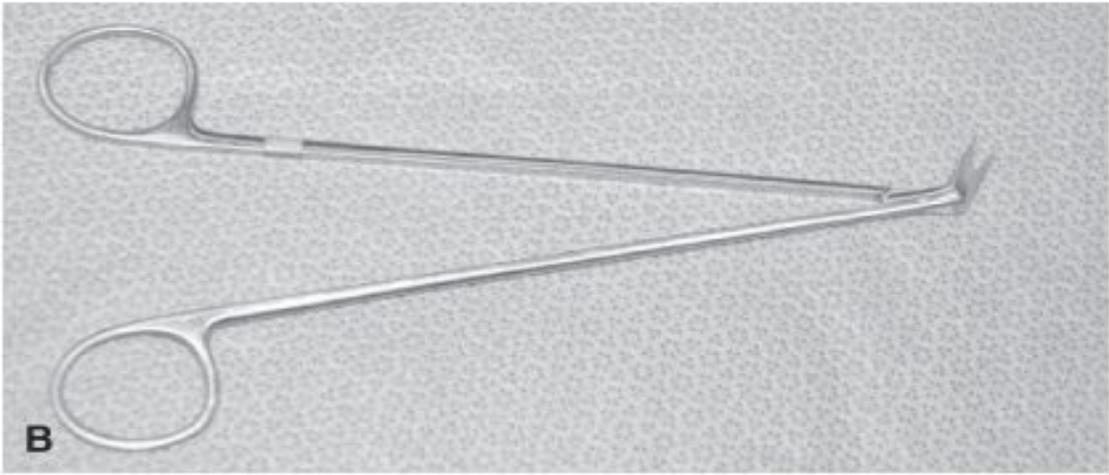
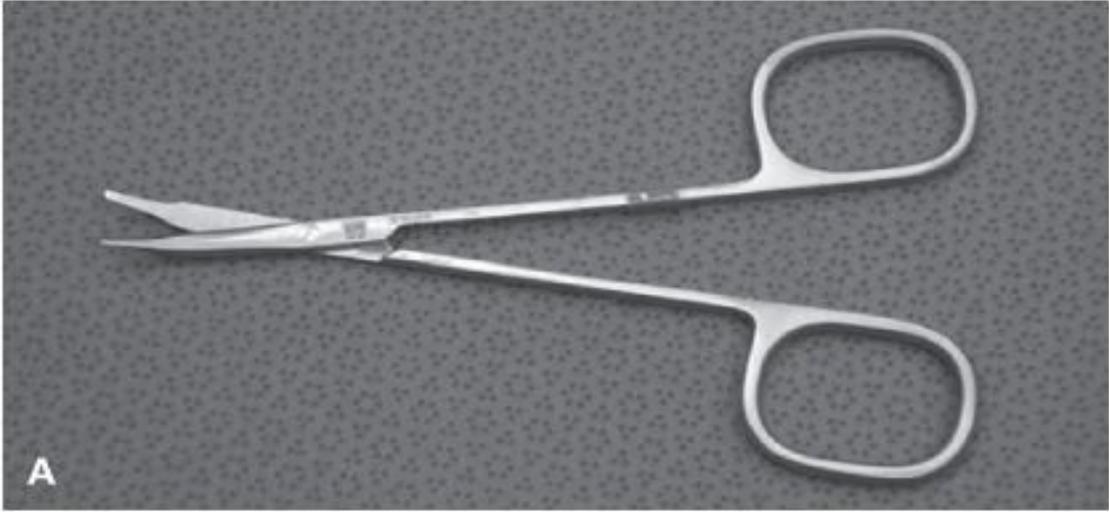


Figure 15-1

82. If arch bars remain in the patient postoperatively, which instrument must accompany the patient to postanesthesia care unit (PACU) in order to open the mouth in case of emergency?

- (A) B
- (B) A
- (C) C
- (D) None of the above

83. What instrument would be used to extend the incision on a carotid?

- (A) A
- (B) B
- (C) C
- (D) None of the above

84. Which instrument is used for a blepharoplasty?

- (A) B
- (B) C
- (C) A
- (D) None of the above

85. The name of the instrument below ([Figure 15-2](#)) is

____, which is also known as uterine dilators.

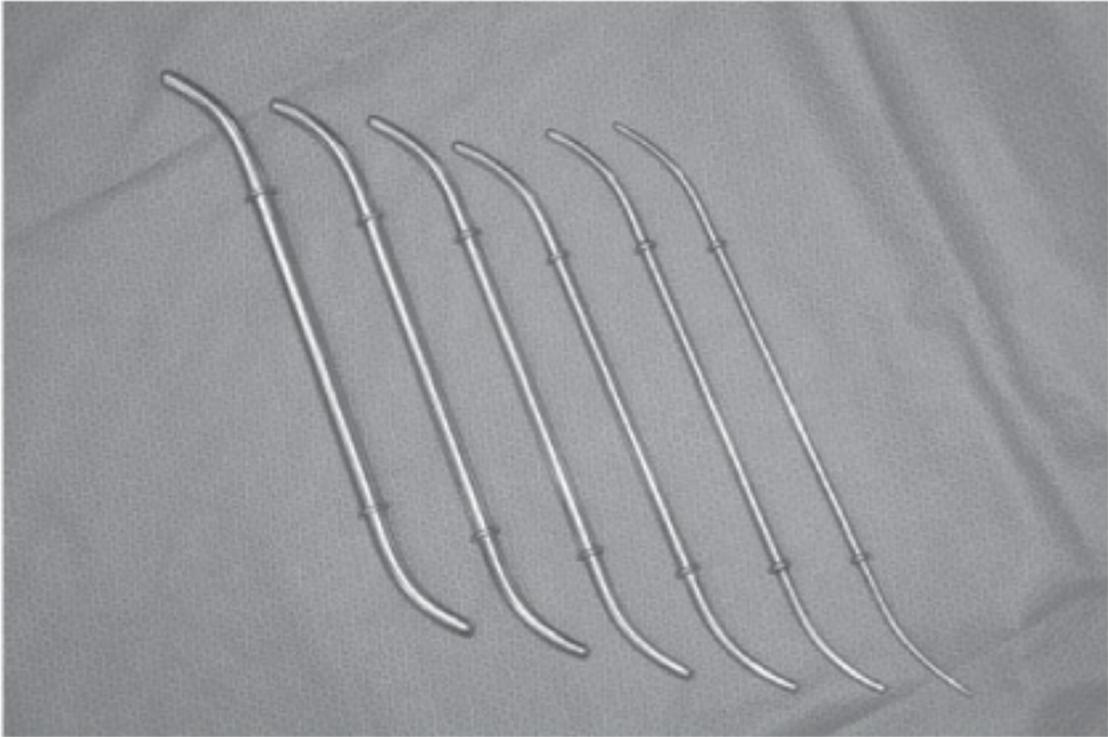


Figure 15-2

- (A) Bakes dilators
- (B) Hanks dilators
- (C) Hegar dilators
- (D) Van Buren dilators

86. What is the instrument below ([Figure 15-3](#)) called?

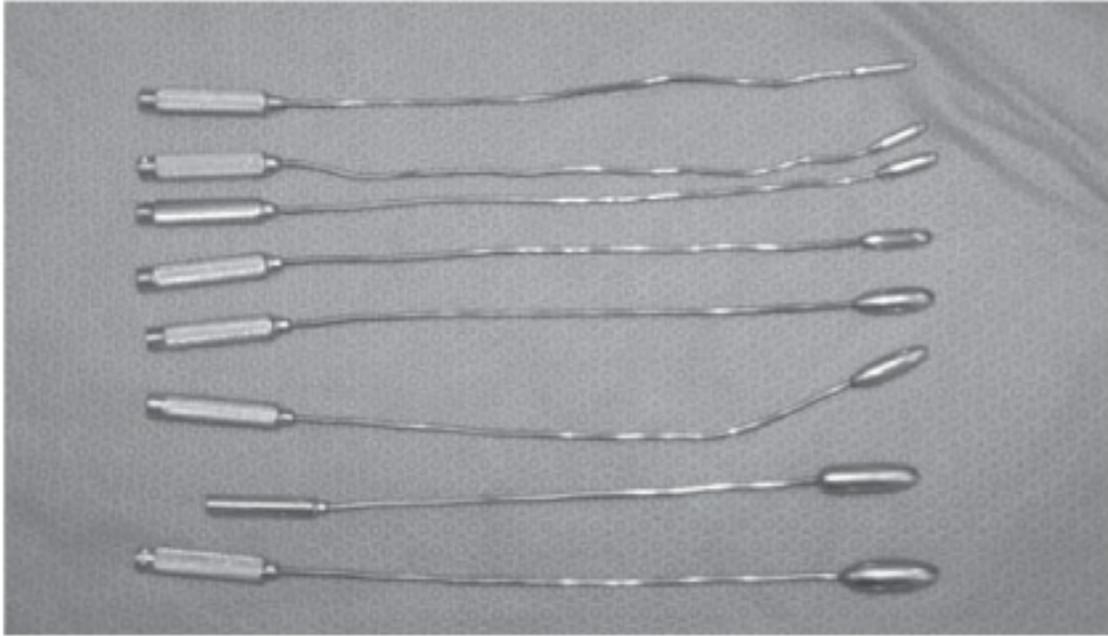


Figure 15-3

- (A) Vanburen sound
- (B) Bougies
- (C) Bakes dilators
- (D) Garrette dilators

Questions 87 through 90: The following group of questions is preceded by a group of instrument images ([Figure 15-4](#)). For each question, select the one lettered option that is the best answer.



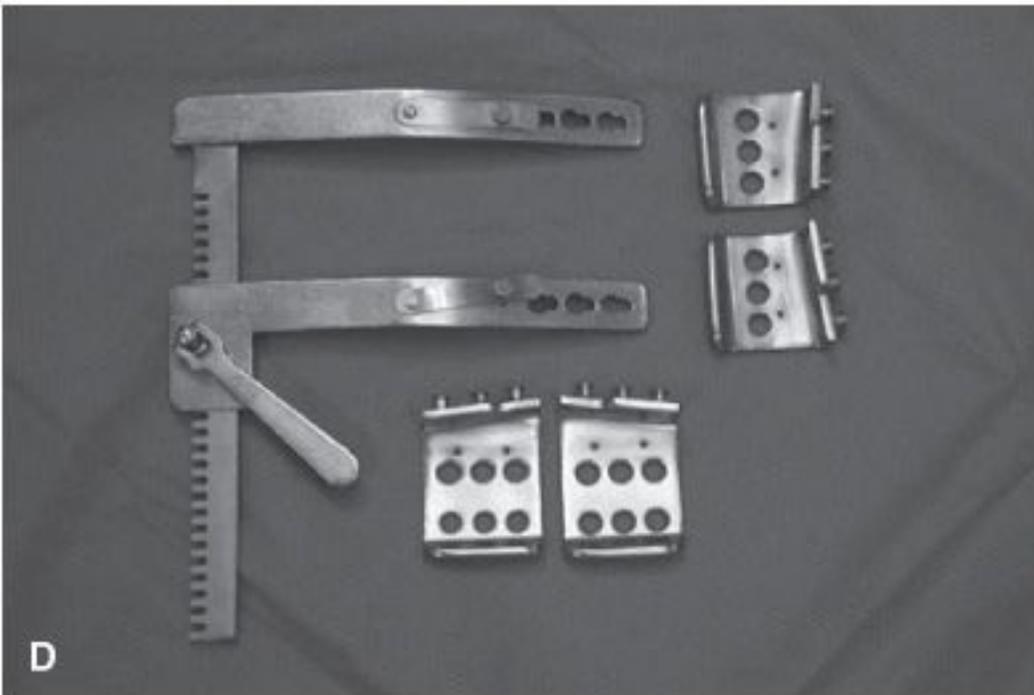


Figure 15-4

87. Which instrument is the Bookwalter?

- (A) A
- (B) B

- (C) C
- (D) D

88. Which instrument is a chest spreader/rib spreader?

- (A) B
- (B) C
- (C) D
- (D) Both B and D

89. What retractor is used in abdominal procedures and commonly used in pelvic procedures?

- (A) A
- (B) B
- (C) D
- (D) None of the above

90. Which instrument is the Balfour retractor?

- (A) A
- (B) B
- (C) C
- (D) D

91. The name of the instrument [Figure 15-5](#) is

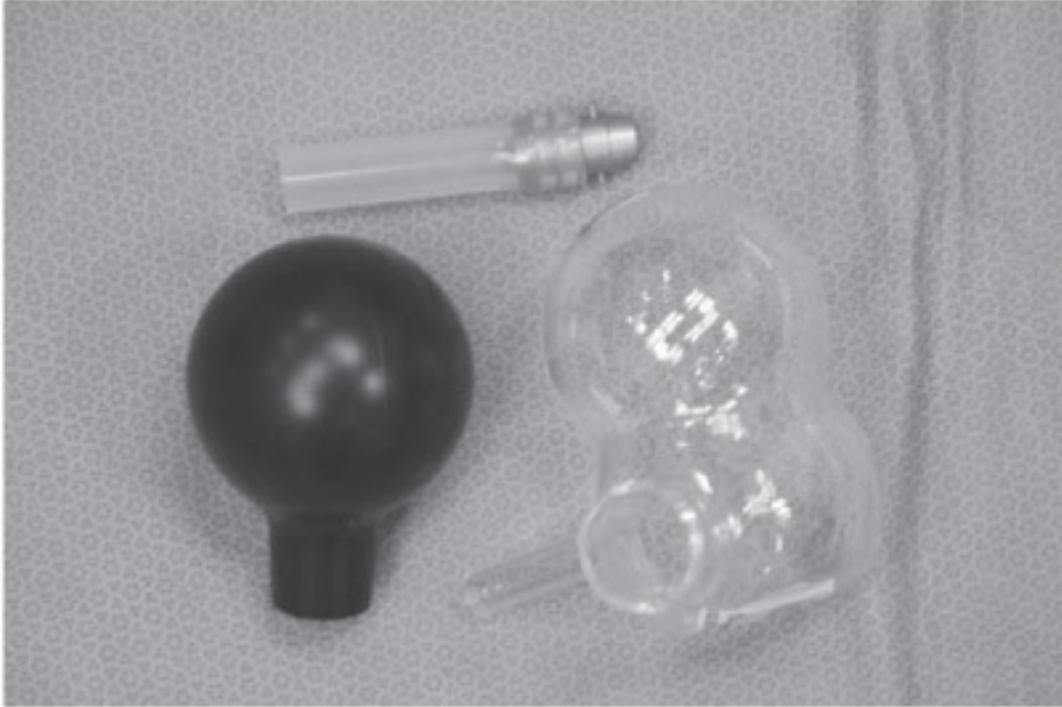


Figure 15-5

- (A) Toomey
- (B) Microvasive evacuator
- (C) Bulb
- (D) Ellik

Questions 92 and 94: The following group of questions is preceded by a group of instrument images ([Figure 15-6](#)). For each question, select the one lettered option that is the best answer.

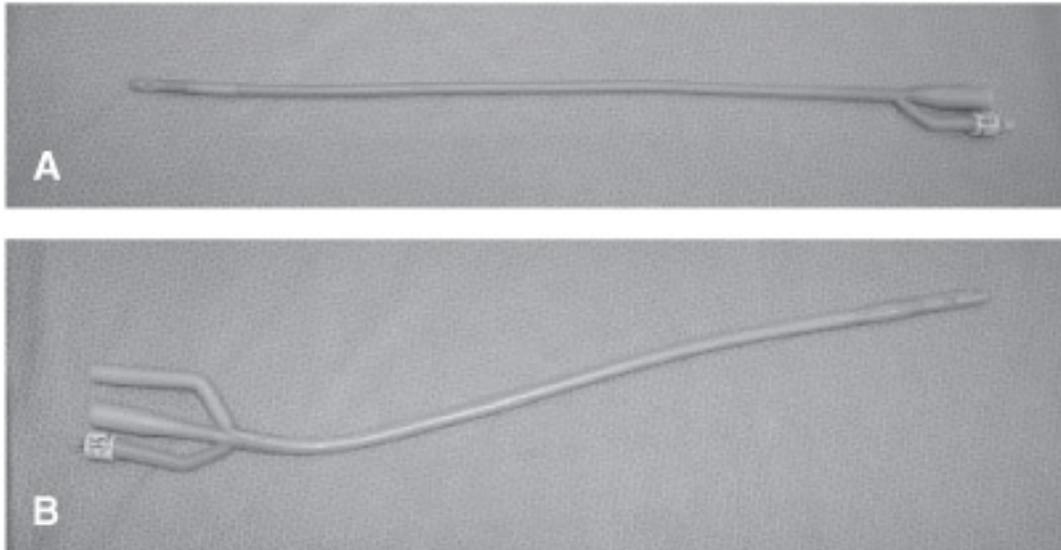


Figure 15-6

92. Which catheter is used for intermittent or continuous bladder irrigation?

- (A) A
- (B) B
- (C) Both A and B
- (D) None of the above

93. What catheter is also called a retention indwelling catheter?

- (A) A
- (B) B
- (C) Both A and B
- (D) None of the above

94. [Figure 15-6A](#) is a two-way Foley 5-cc balloon used

for

- (A) urinary drainage
- (B) tamponade
- (C) irrigation and aspiration
- (D) common nonretaining catheter

95. What is the name of the instrument in [Figure 15-7](#)?

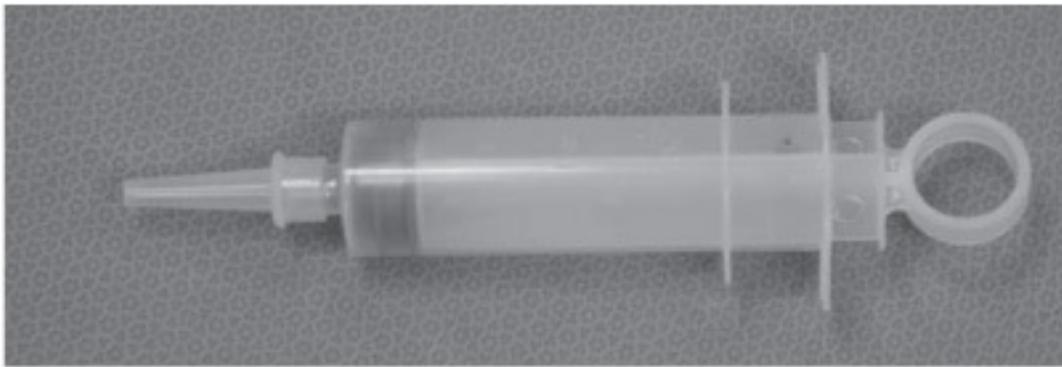
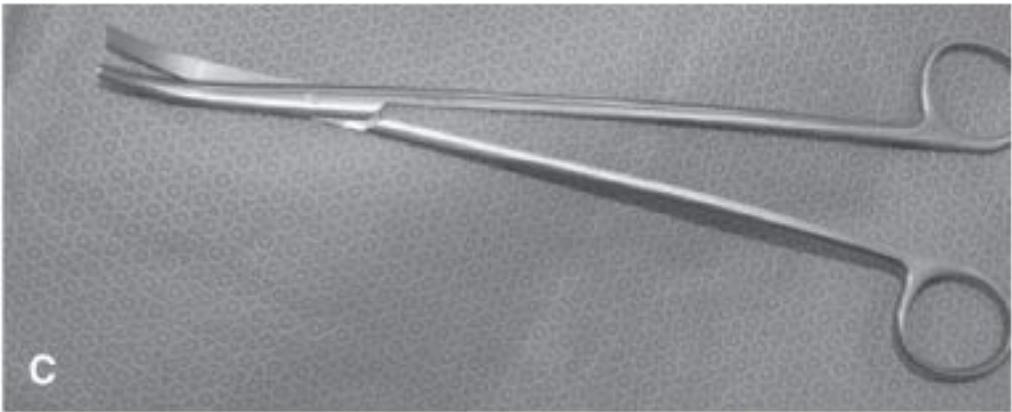
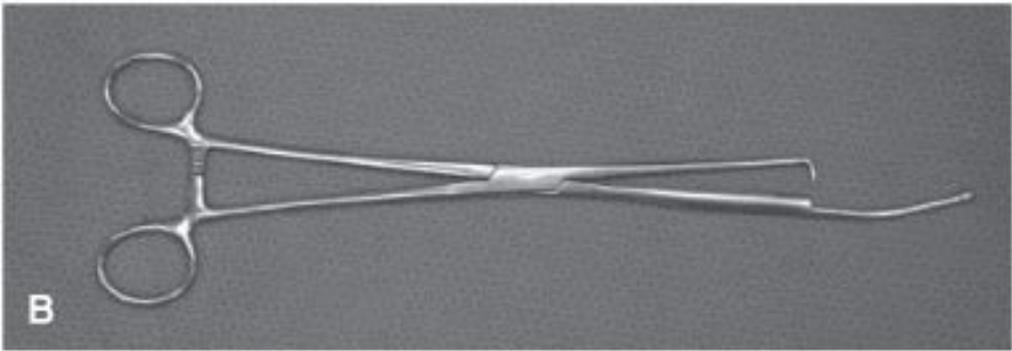
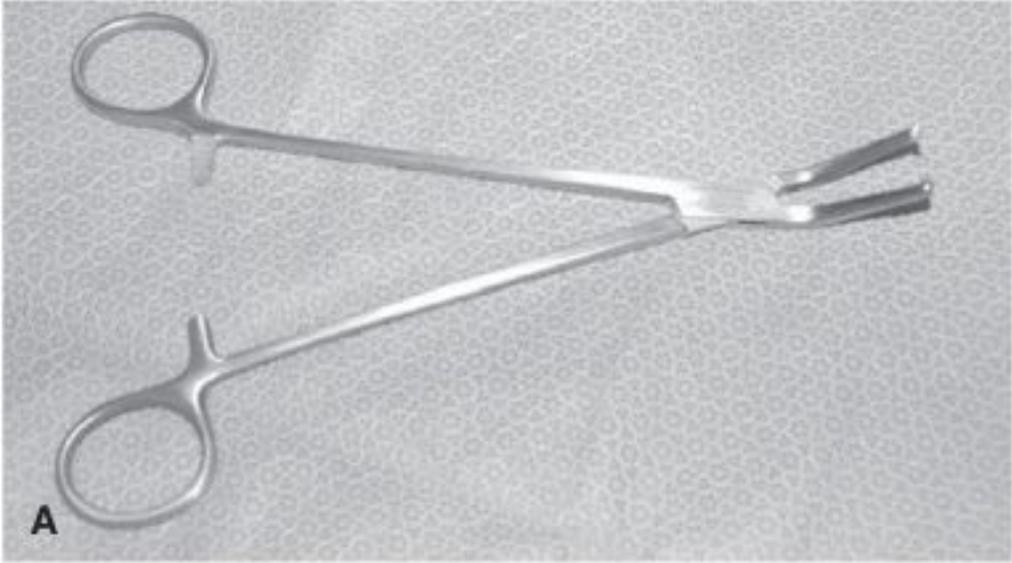


Figure 15-7

- (A) Luer lock syringe
- (B) Toomey
- (C) Asepto
- (D) Elik

Questions 96 through 101: The following group of questions is preceded by a group of instrument images ([Figure 15-8](#)). For each question, select the one lettered option that is the best answer.



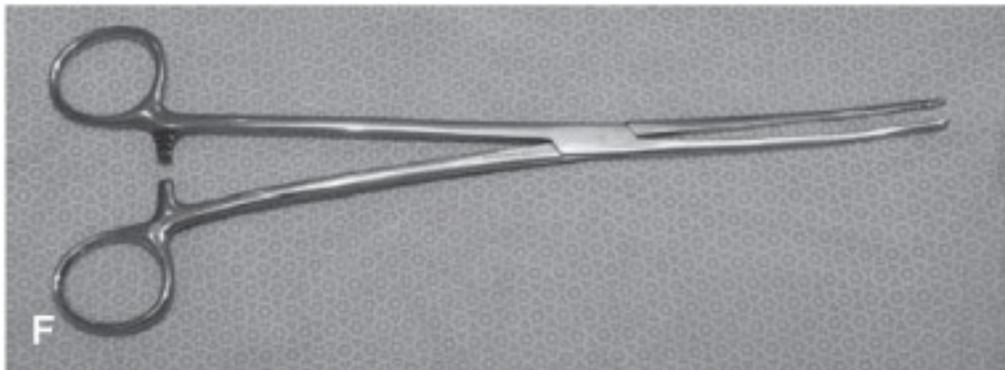
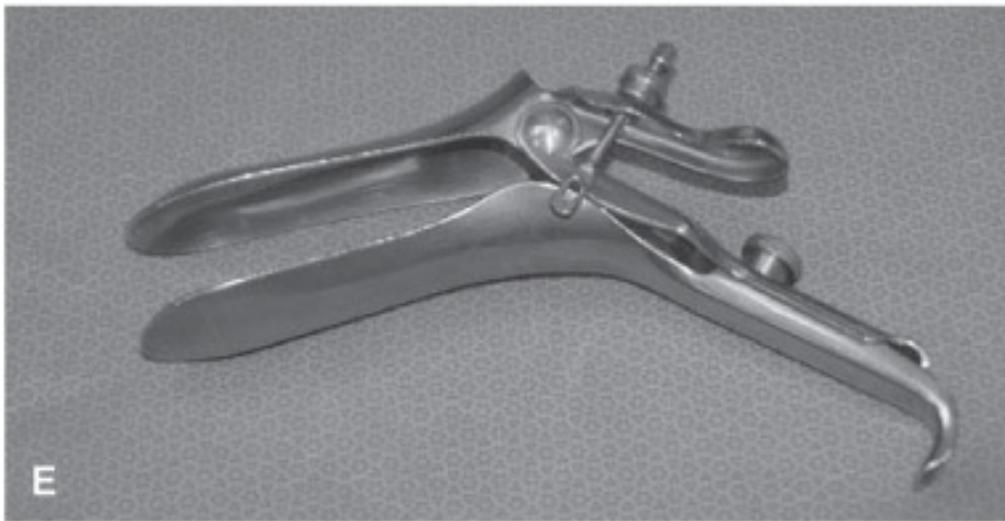
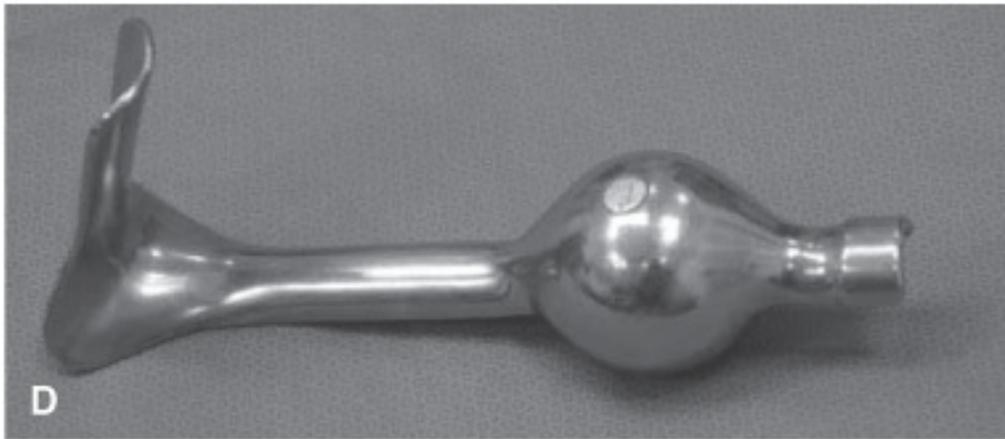


Figure 15-8

96. What instrument provides retraction of the posterior vaginal wall?

- (A) B
- (B) D
- (C) E
- (D) F

97. What is the name of the instrument in [Figure 15-8C](#)?

- (A) Jarit
- (B) Heaney
- (C) Jorgenson
- (D) Westcott

98. What instrument is used as a uterine manipulator?

- (A) A
- (B) B
- (C) E
- (D) F

99. What is the name of the instrument in [Figure 15-8F](#)?

- (A) Simpson
- (B) Heaney
- (C) Bozeman
- (D) Ochsner

00. The name of the instrument in [Figure 15-8A](#) is called

- (A) Jacobs
- (B) Schroeder
- (C) Graves
- (D) Phaneuf

01. Another name for the instrument in [Figure 15-8E](#) is the duckbill. What is the proper name for this instrument?

- (A) Eastman
- (B) Graves
- (C) Young anterior
- (D) Auvard

02. What is the name of the electrode in [Figure 15-9](#)?

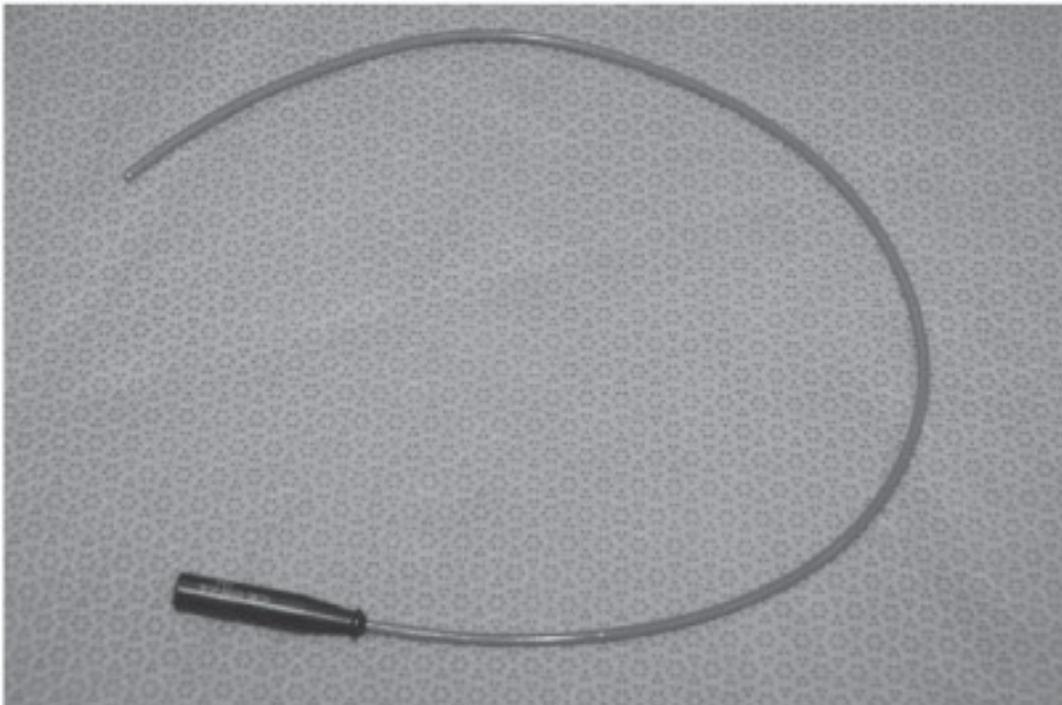


Figure 15-9

- (A) Ball loop
- (B) Loop
- (C) Bugbee
- (D) The working element

03. What is the name of the electrode in [Figure 15-10](#)?

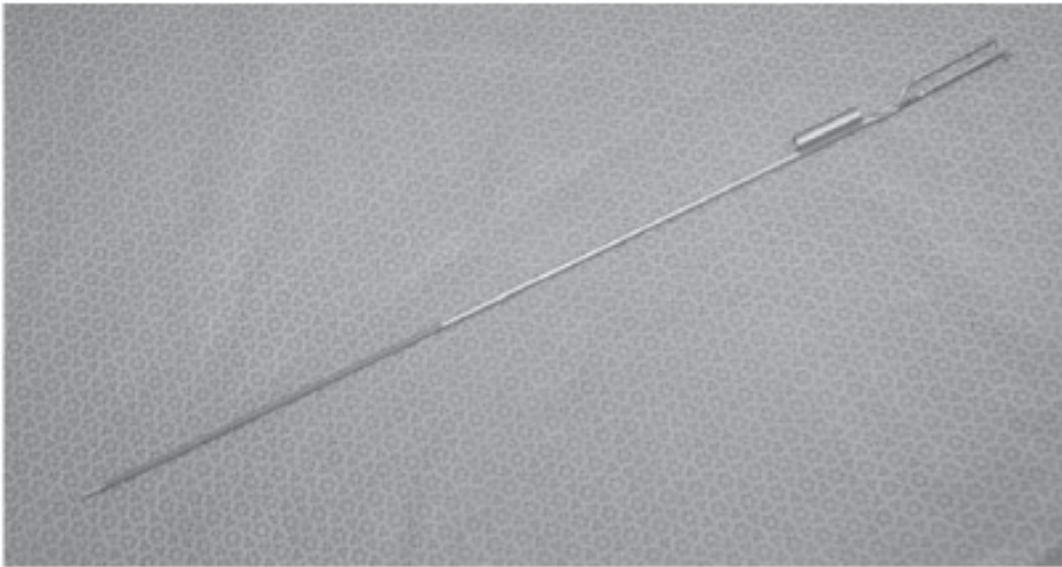


Figure 15-10

- (A) Ball loop
- (B) Working element
- (C) Randall
- (D) Loop electrode

04. What is the name of the instrument in [Figure 15-11](#)?

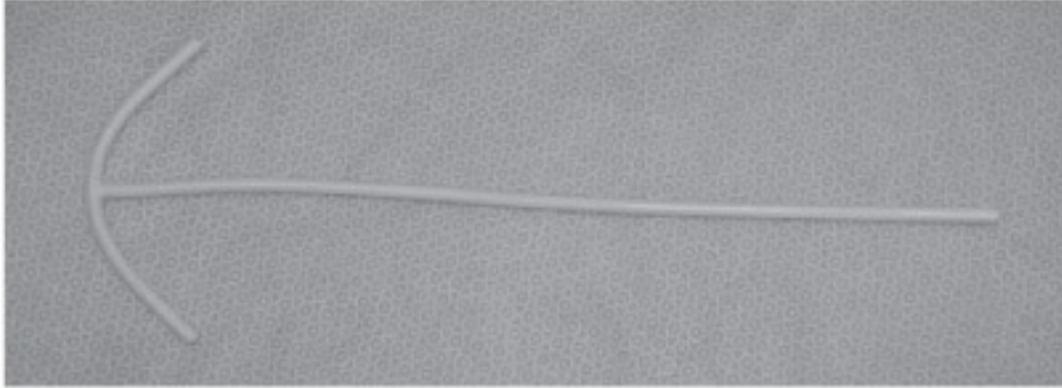


Figure 15-11

- (A) Nephrostomy tube
- (B) Fogarty
- (C) T-tube
- (D) Cigarette drain

05. Instrument in [Figure 15-12](#) would commonly be found on which setup?

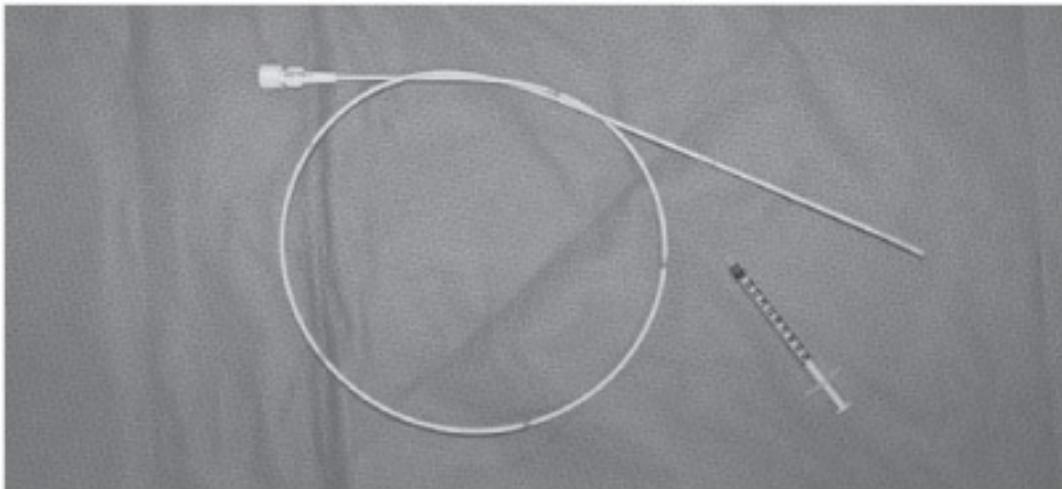
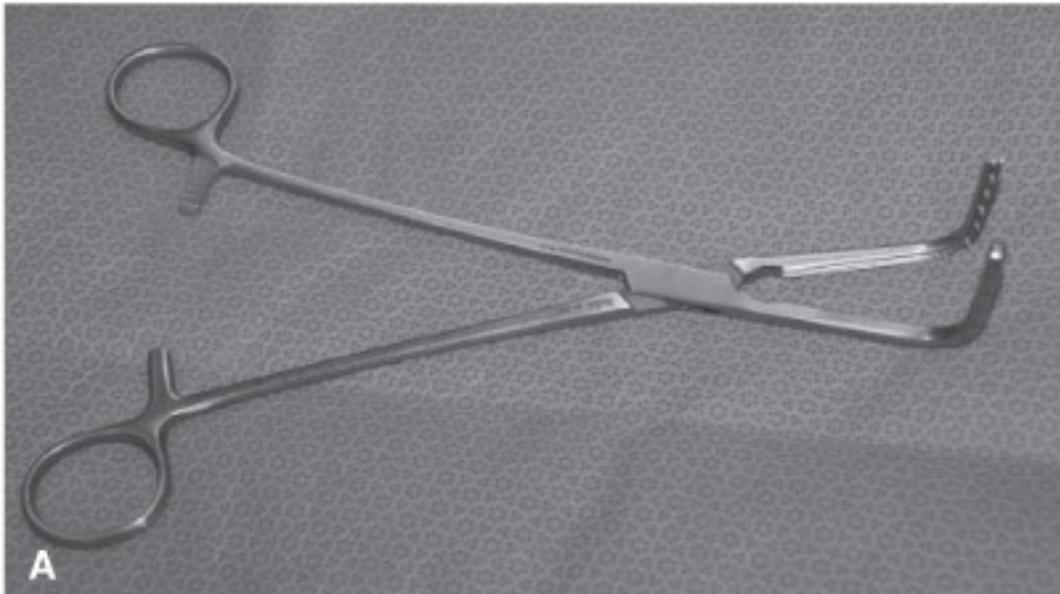


Figure 15-12

- (A) Orthopedic
- (B) Vascular
- (C) Ophthalmology
- (D) Plastic

Questions 106 through 108: The following group of questions is preceded by a group of instrument images ([Figure 15-13](#)). For each question, select the one lettered option that is the best answer.



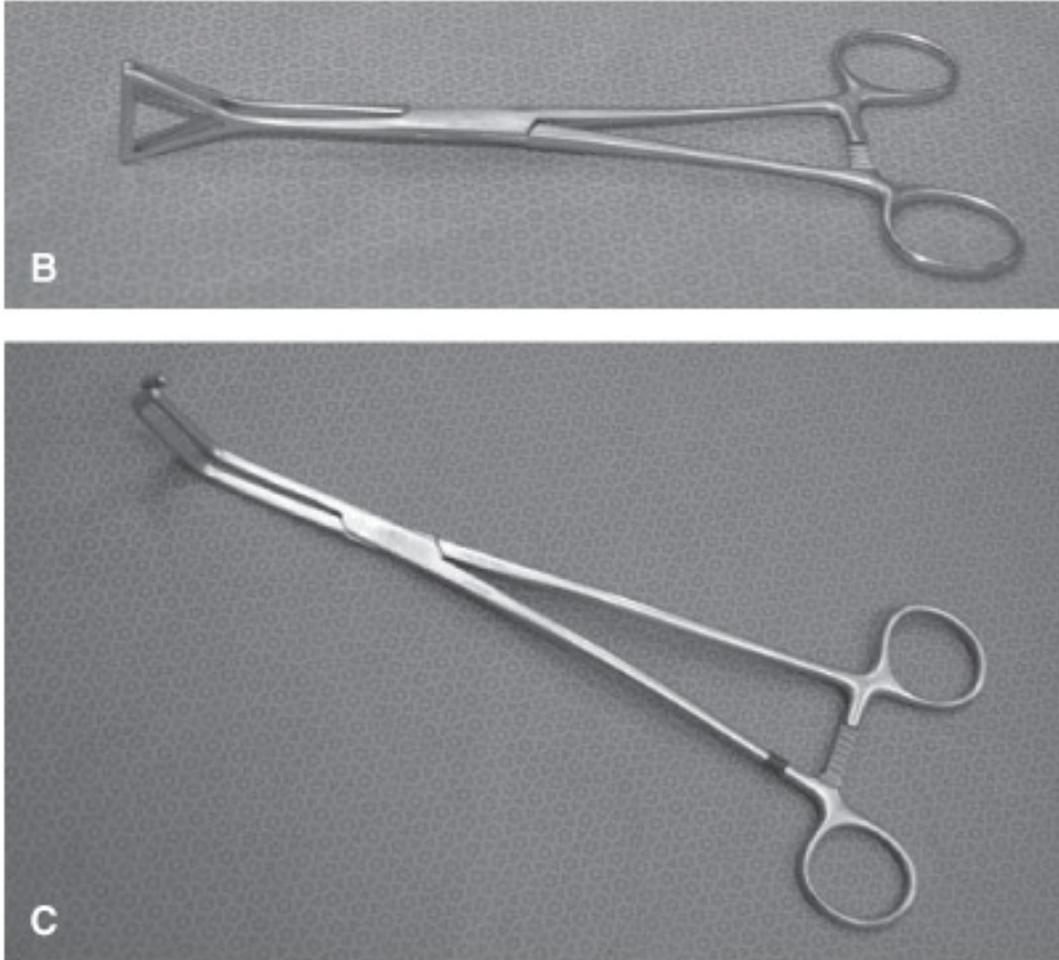


Figure 15-13

06. What instrument is used to grasp the lung?

- (A) A
- (B) B
- (C) C
- (D) None of the above

07. What is the name of the instrument in [Figure 15-13A](#)?

- (A) Sarot

- (B) Cooley
- (C) Potts-smith
- (D) Javid

08. What is the name of the instrument in [Figure 15-13C](#)?

- (A) Glover
- (B) Cooley
- (C) Javid
- (D) Statinsky

Questions 109 and 110: The following group of questions is preceded by a group of instrument images ([Figure 15-14](#)). For each question, select the one lettered option that is the best answer.

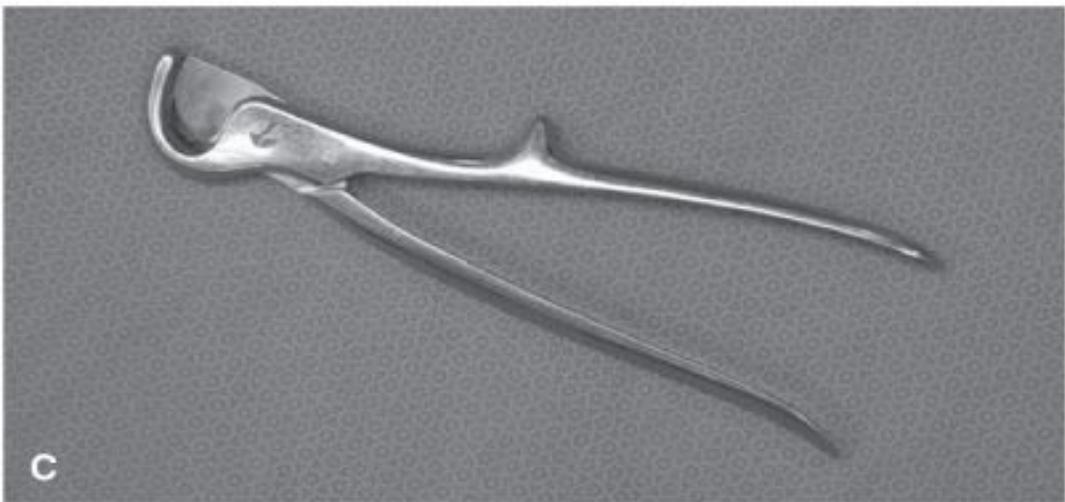
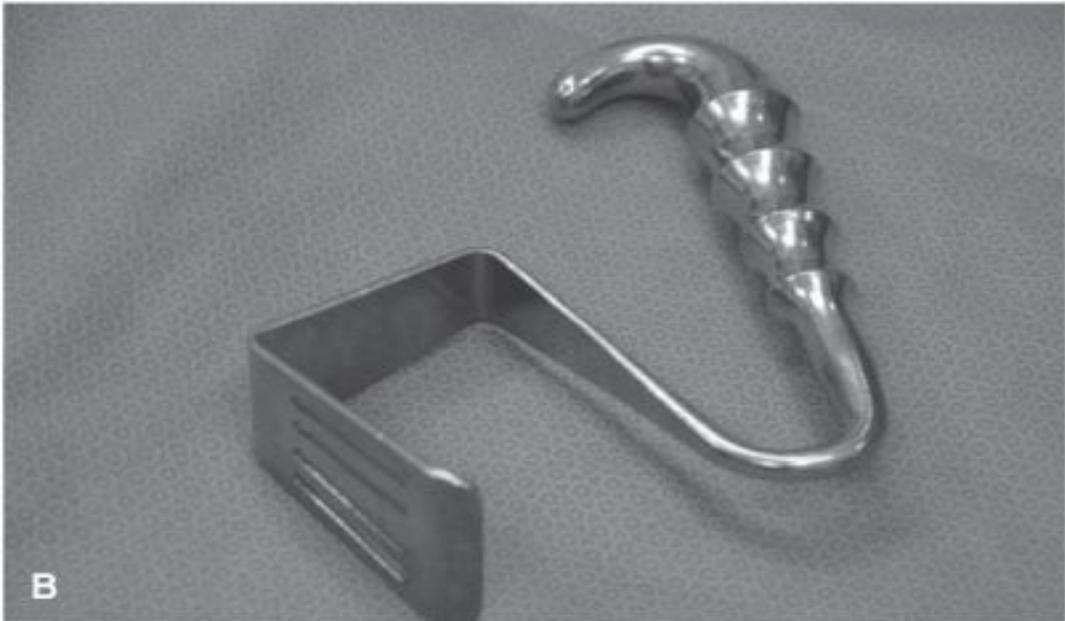


Figure 15-14

09. The instrument used to cut rib bone is.

- (A) A
- (B) B
- (C) C
- (D) Both A and C

10. The instrument in [Figure 15-14B](#) is

- (A) Allison lung retractor
- (B) Cooley arterial retractor
- (C) Davidson scapula retractor
- (D) Finechetto retractor

11. The instrument in [Figure 15-15](#) would commonly be found on what procedure?

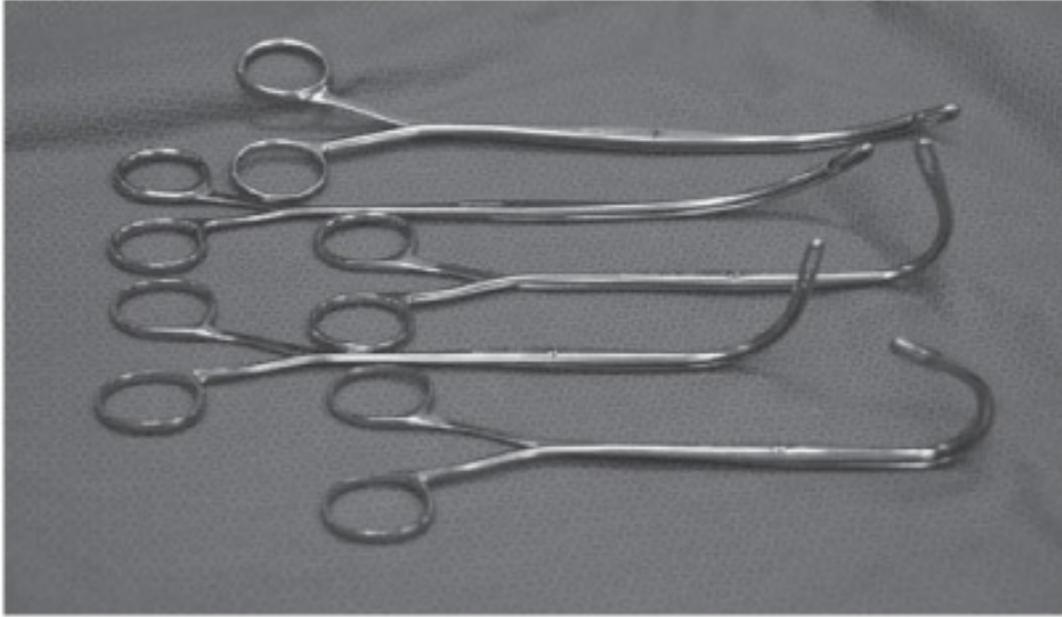


Figure 15-15

- (A) Colon resection
- (B) Laparoscopic cholecystectomy
- (C) Common duct exploration
- (D) Hysterectomy

Questions 112 and 113: The following group of questions is preceded by [Figure 15-16](#). For each question, select the one lettered option that is the best answer.

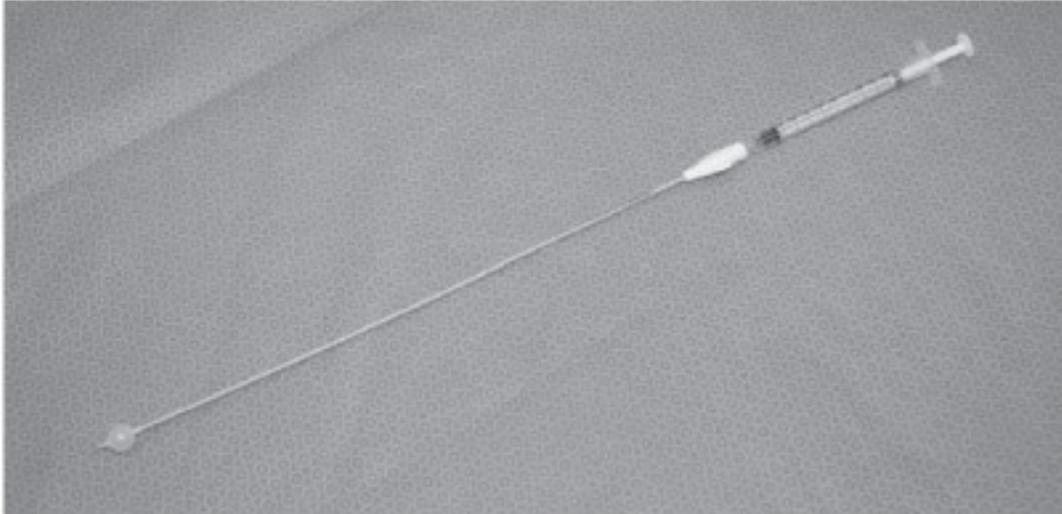


Figure 15-16

12. The catheter in [Figure 15-16](#) would be used on

- (A) CBD
- (B) Artery
- (C) Vein
- (D) Both B and C

13. The instrument in [Figure 15-16](#) is called

- (A) Red Robinson catheter
- (B) Fogarty embolectomy catheter
- (C) Malecott
- (D) Fogarty biliary catheter

14. The instruments in [Figure 15-17](#) would commonly be found on what procedure?

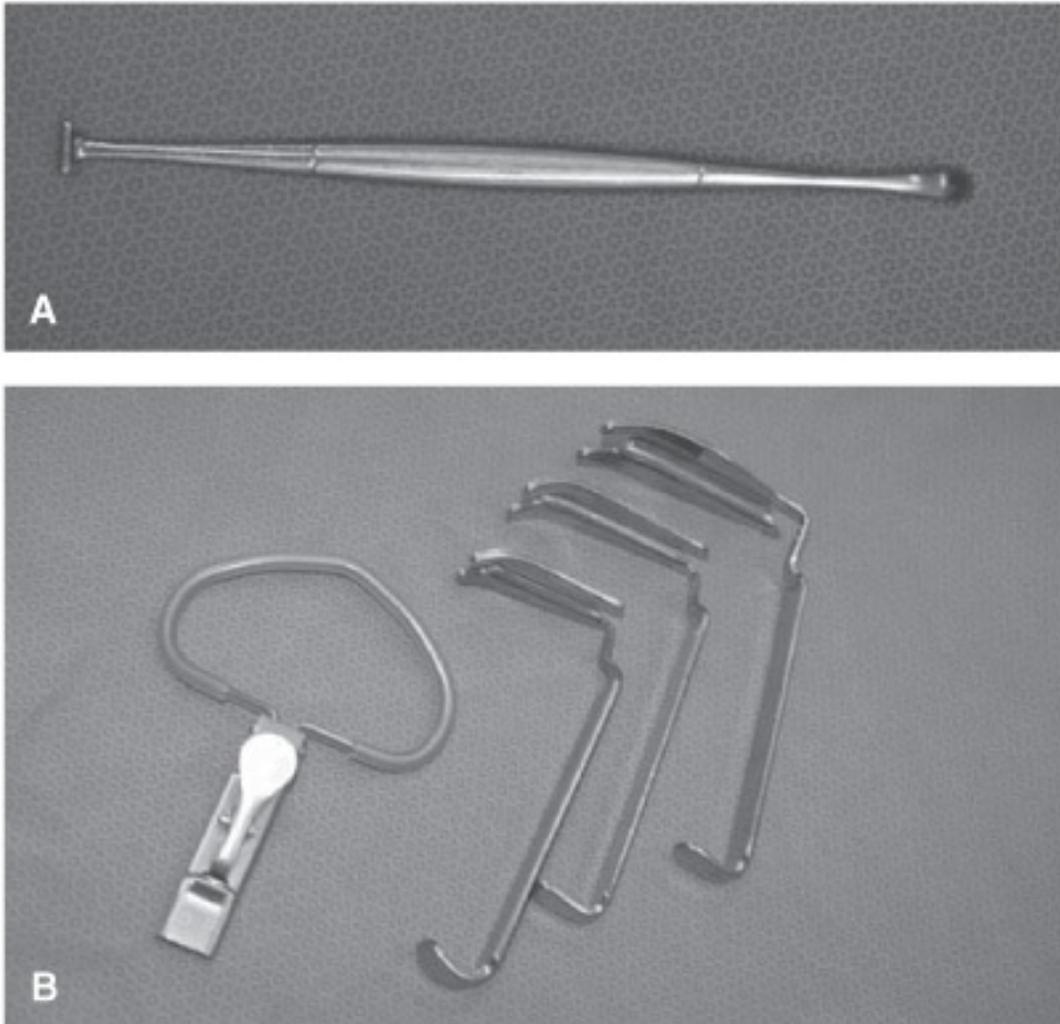
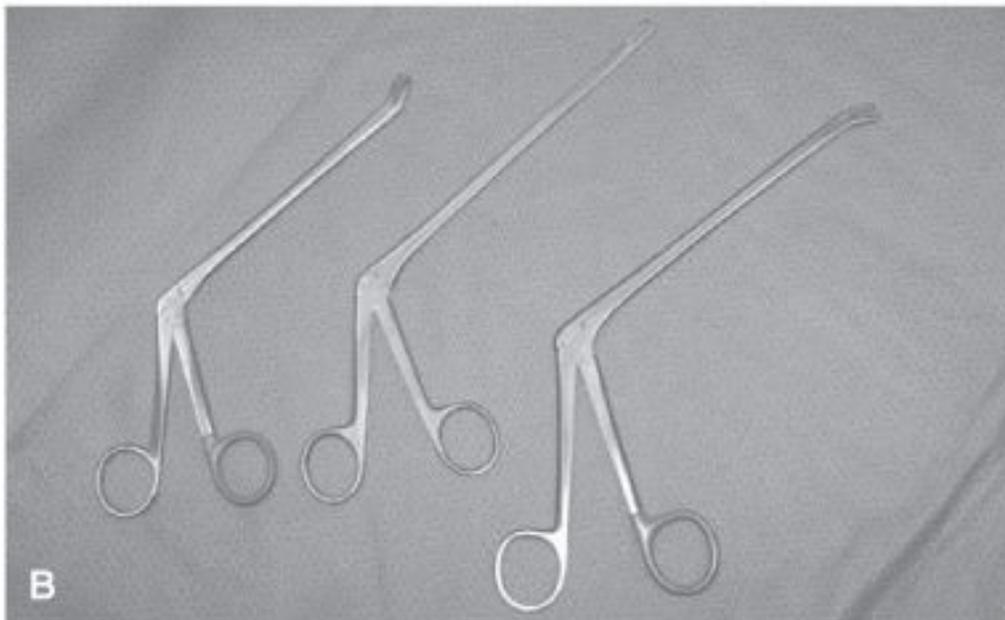
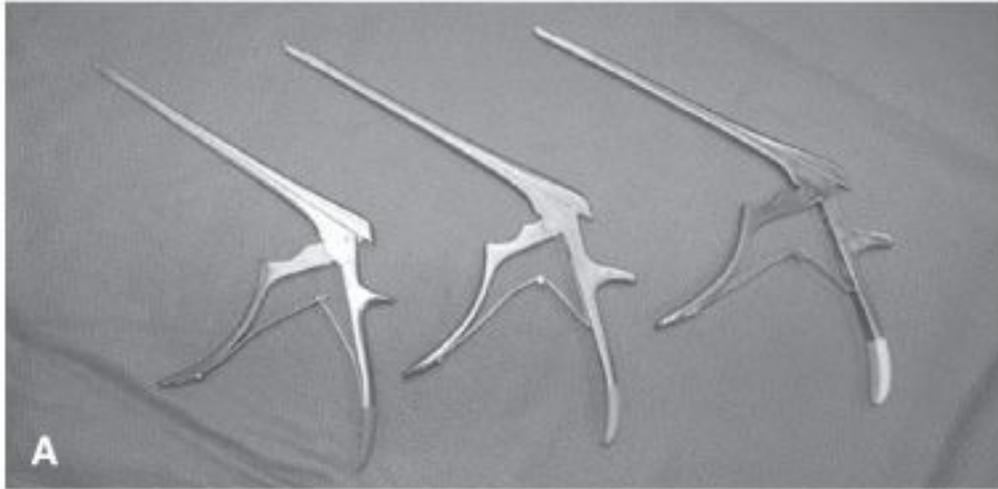


Figure 15-17

- (A) Arch bars
- (B) Dental extraction
- (C) Tracheostomy
- (D) Tonsillectomy

Questions 115 through 118: The following group of questions is preceded by a group of instrument images

([Figure 15-18](#)). For each question, select the one lettered option that is the best answer.



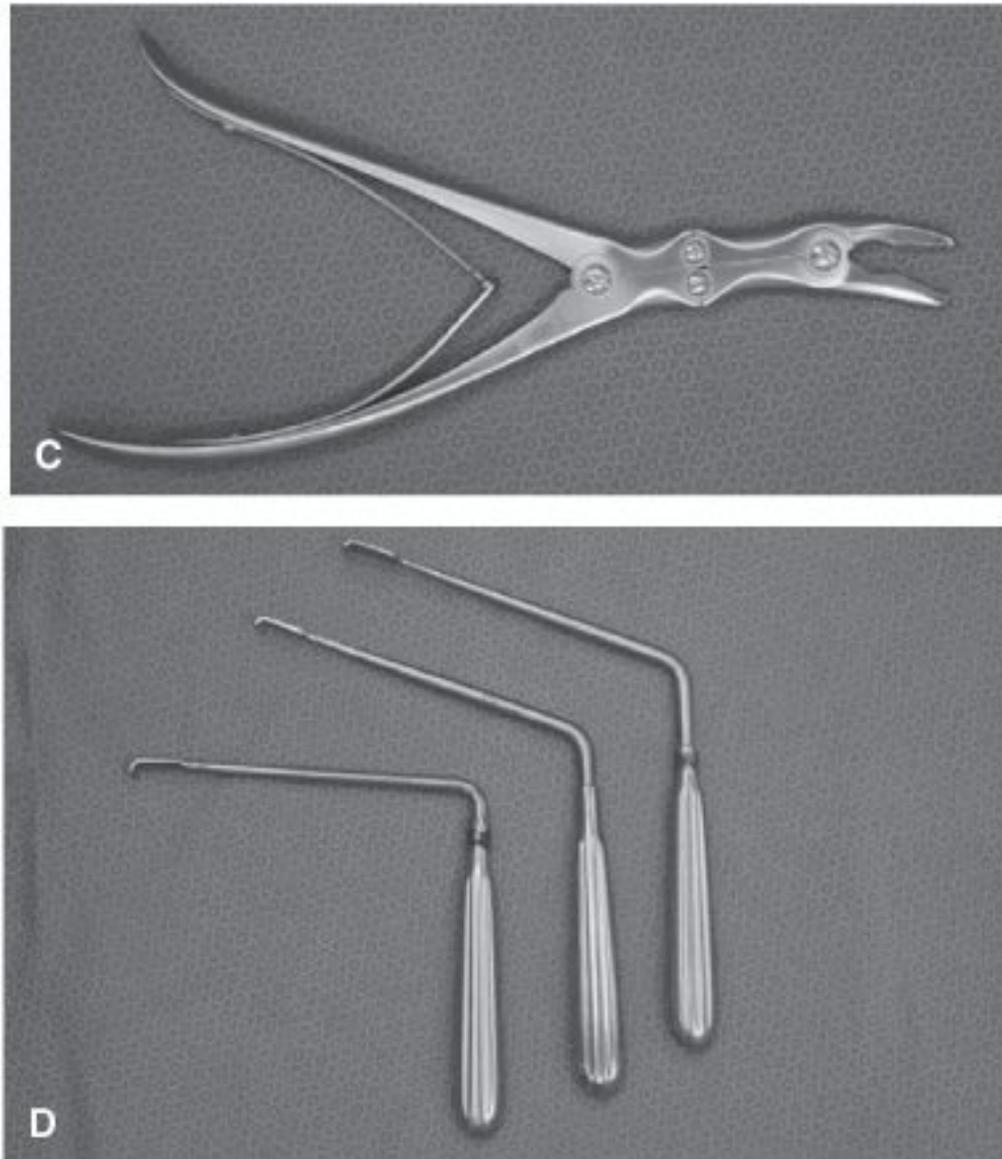


Figure 15-18

15. The instrument in [Figure 15-18A](#) is called

- (A) Lexsell
- (B) Pituitary
- (C) Scoville
- (D) Kerrison

16. The instrument in [Figure 15-18B](#) is

- (A) Leksell
- (B) Pituitary
- (C) Scoville
- (D) Taylor

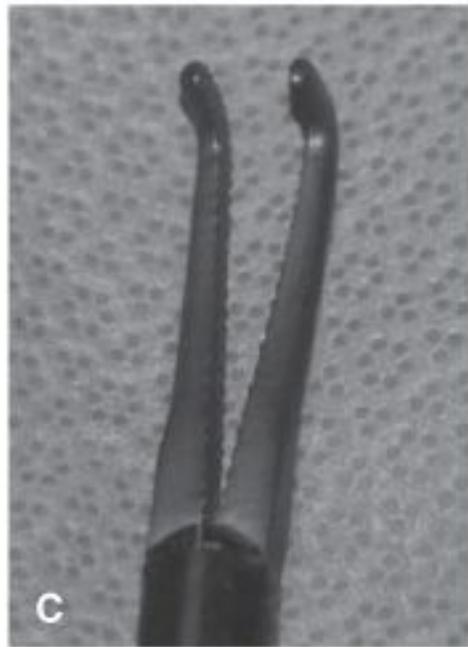
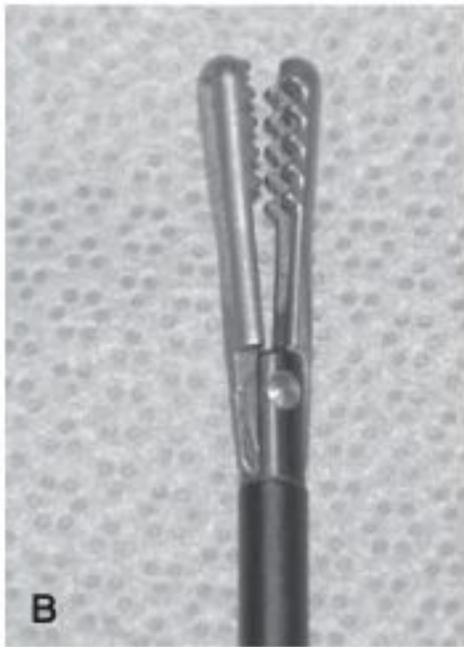
17. The instrument in [Figure 15-18C](#) is a Leksell rongeur.
It is used

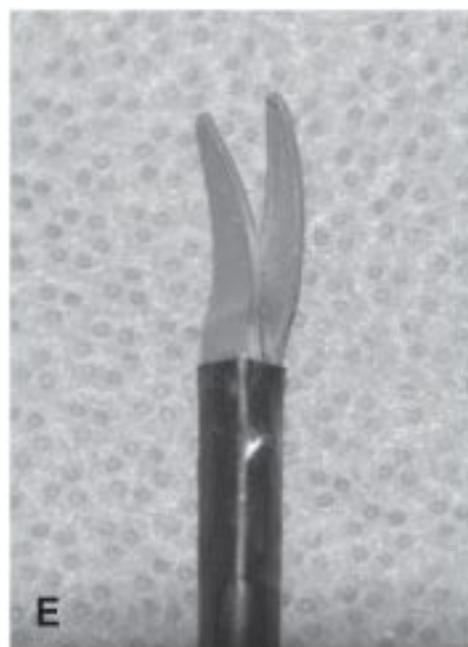
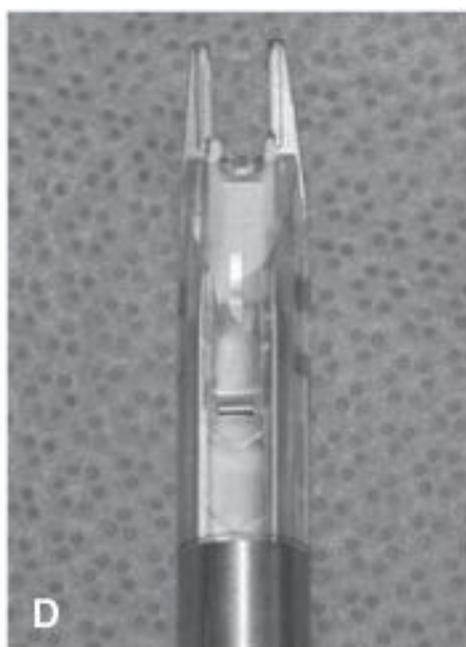
- (A) to remove pieces of bone and soft tissue surrounding the bone
- (B) to remove the spinous processes
- (C) to extract teeth
- (D) Both A and B

18. The instrument in [Figure 15-18D](#) is

- (A) Scoville
- (B) Cobb
- (C) Pituitary
- (D) Cloward

Questions 119 through 127: The following group of questions is preceded by a group of instrument images ([Figure 15-19](#)). For each question, select the one lettered option that is the best answer.







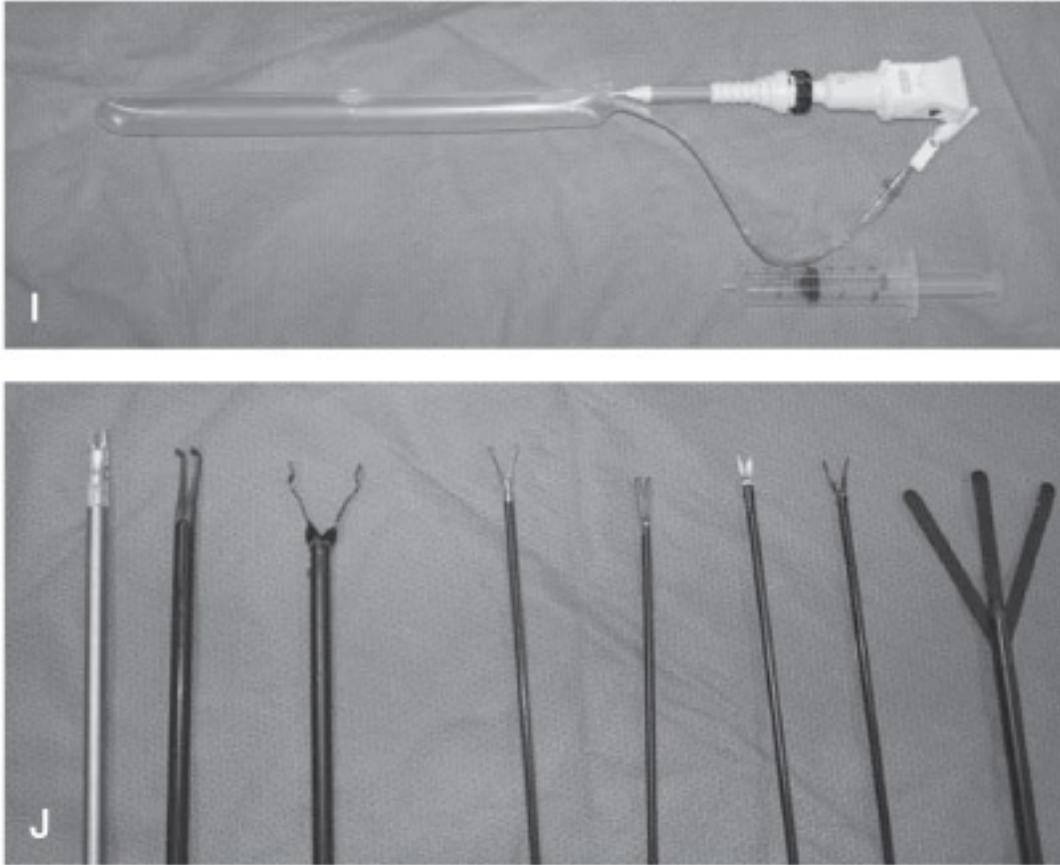


Figure 15-19

19. Which instrument is used to put traction on the gallbladder?

- (A) D
- (B) B
- (C) F
- (D) E

20. Which instrument is used to peel adhesions while to visualize the cystic duct and cystic artery?

- (A) C
- (B) E
- (C) G
- (D) H

21. Which instrument is used to ligate the cystic artery?

- (A) C
- (B) B
- (C) D
- (D) G

22. Which instrument is used to divide the cystic following the ligation?

- (A) D
- (B) E
- (C) H
- (D) G

23. Which instrument is used for hydrodissection?

- (A) C
- (B) D
- (C) E
- (D) F

24. Which instrument is used to cauterize fallopian tubes?

- (A) B
- (B) C
- (C) G
- (D) All of the above

25. Which instrument is used to retract the liver from obscuring the view of the gallbladder?

- (A) A
- (B) H
- (C) I
- (D) F

26. Which instrument is used to expand the abdomen during a TEP (total extra peritoneal) inguinal hernia repair?

- (A) I
- (B) A
- (C) G
- (D) F

27. The instruments in [Figure 15-19J](#) are used for

- (A) laparoscopic hernia repair
- (B) laparoscopic cholecystectomy
- (C) laparoscopic bowel resection

(D) All of the above

Questions 128 through 130: The following group of questions is preceded by a group of instrument images ([Figure 15-20](#)). For each question, select the one lettered option that is the best answer.



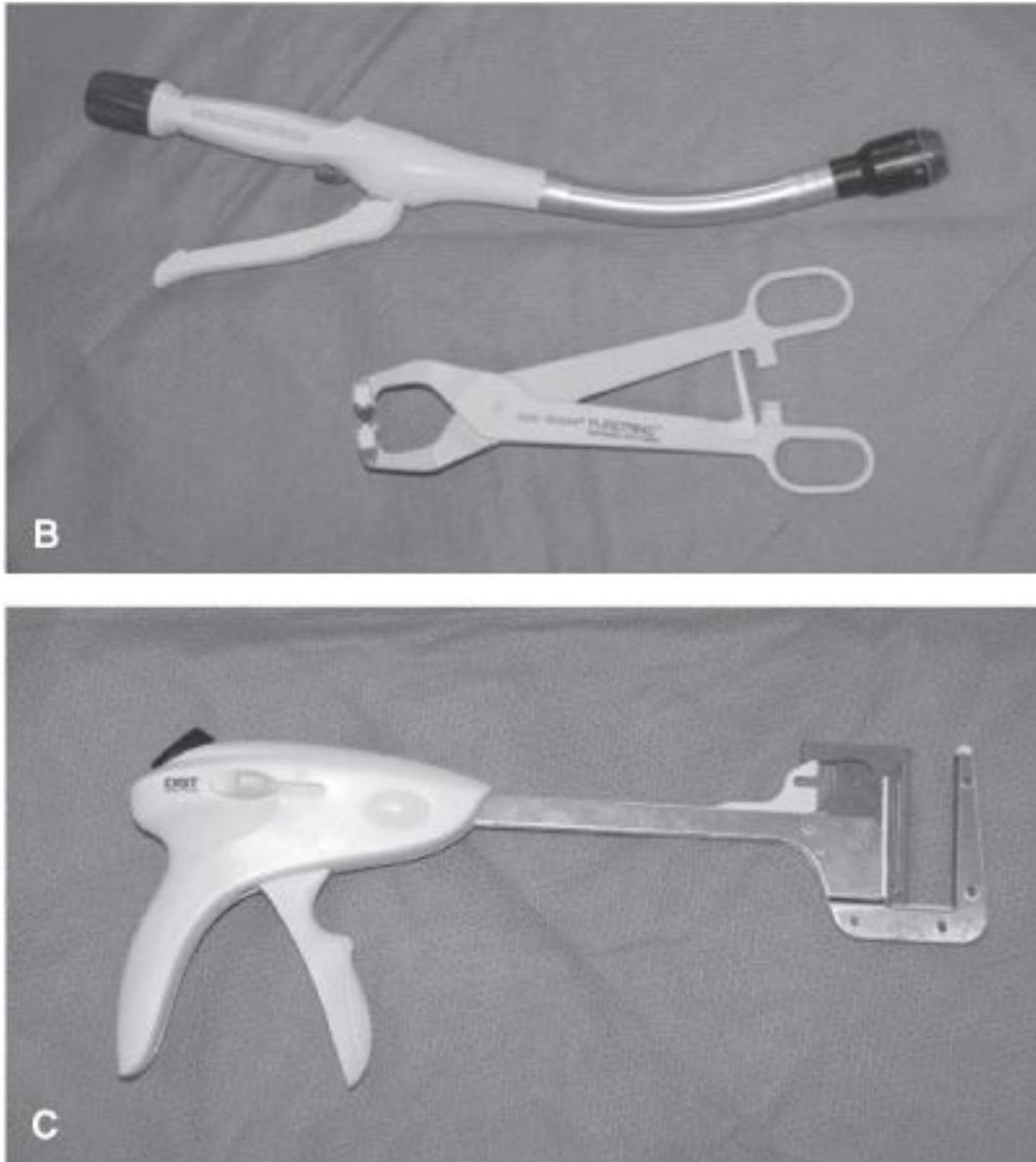


Figure 15-20

28. What stapling instrument is used to join two arms of the intestines together, shown in [Figure 15-20B](#)?

(A) thoracoabdominal (TA)

(B) gastrointestinal intestinal anastomosis (GIA)

- (C) end-to-end-anastomosis (EEA)
- (D) ligate, divide and staple (LDS)

29. The instrument in [Figure 15-20C](#) is used

- (A) to ligate and divide tubular structures and vessels
- (B) to provide end to end or side to side anastomosis
- (C) to provide the same function as a pursestring suture
- (D) for resection and transaction

30. The instrument in [Figure 15-20A](#) is used for

- (A) resection and transection
- (B) resection and creation of an anastomosis
- (C) resect tubular structures and vessels
- (D) perform the same function as a pursestring suture

Answers and Explanations

- 1. (D)** Harrington Rods are internal splints that help maintain the spine as straight as possible until vertebral body fusion becomes solid (Rothrock).
- 2. (C)** Once a clip has been fastened through a drape, do not remove it because the points are contaminated. If it is necessary to remove one during a case, discard it from the field and cover the area with a piece of sterile linen (Fortunato).
- 3. (B)** Old blood and debris should be removed from instruments as soon as possible with water so that it does not dry on surfaces or crevices. Saline can damage surfaces, causing corrosion and pitting (Fortunato).
- 4. (D)** With the ESU, electrical energy flows from the generator through a sterile active electrode to the patient including both bipolar forceps or monopolar forceps (Rothrock).
- 5. (C)** Self-retaining retractors, such as the Balfour, can cause the potential for bruising and nerve and muscle

damage more than the hand held retractors (Fuller).

- 6. (A)** The Poole's suction tip has a guard which protects intestinal organs (Fuller).
- 7. (C)** Dull hooks and rakes are used in areas close to viable nerves and blood vessels, and sharp rakes are designed to grasp superficial tissue (Fuller).
- 8. (D)** Heaney and Kochers contain teeth and/or serrations in order to grasp, facilitate in dissection, and suturing (Surgical Technology).
- 9. (D)** A Richardson retractor must be hand-held and self-retaining retractors use mechanical action, they have many attachments and they hold tissue against the walls of the surgical wound (Fuller).
- 10. (B)** With this technique, scissors are inserted between the two tissue planes and opened. This separates the layers rather than cutting them (Fuller).
- 11. (A)** Trocars are used to create an opening in which endoscopic instruments can be exchanged where there is no natural opening (Fuller).
- 12. (B)** Blades must be loaded and removed from the

handle with an instrument. Most commonly used is a needle holder and never with your hands (Surgical Technology).

- 13. (A)** A Lebsche sternum knife is used in chest surgery to open the sternum (Meeker and Rothrock).
- 14. (C)** Kerrison refers to a rongeur. It is available in many angles and is used extensively in surgery of the spine and neurosurgery (Meeker and Rothrock).
- 15. (B)** A Finochietto is a rib retractor (Meeker and Rothrock).
- 16. (D)** A Doyen is a rib raspatory (Meeker and Rothrock).
- 17. (A)** An electric drill or a hand perforator is used to make the burr holes. A rongeur is used to enlarge the burr holes and increase exposure (Meeker and Rothrock).
- 18. (B)** Wescott tenotomy scissors are fine scissors with a spring action used in eye surgery (Meeker and Rothrock).

- 19. (D)** For splenectomy, prepare a basic laparotomy set plus two large right-angled pedicle clamps and long instruments and hemostatic materials (Meeker and Rothrock).
- 20. (B)** Bowman probes are used to probe the lacrimal duct in a dacrocystorhinostomy and in lacrimal probing to open a closed lacrimal drainage system (Meeker and Rothrock).
- 21. (D)** The tonsil lobe is freed from its attachments to the pillars with a Hurd dissector and pillar retractor (Meeker and Rothrock).
- 22. (C)** The Lempert elevator is used in delicate ear surgery (Meeker and Rothrock).
- 23. (C)** The Scoville is a retractor used in a laminectomy (Meeker and Rothrock).
- 24. (D)** The Bailey rib approximator is used to approximate the ribs for closure of a thoracic incision before closure of the chest with interrupted suture (Meeker and Rothrock).
- 25. (D)** A Sauerbruch is a rib rongeur used to resect a rib

and is found in a thorocotomy rib instrument bone set (Meeker and Rothrock).

26. (C) An Auvard is a speculum that is weighted for use in the vagina. It is placed in the posterior vagina (Meeker and Rothrock).

27. (B) A Babcock forceps is a curved fenestrated blade clamp without teeth that grasps or encloses delicate structures such as the ureter, appendix, or fallopian tube (Meeker and Rothrock).

28. (A) A Ballenger swivel knife is used in rhino-logic surgery. The nasal cartilage is incised with a Ballenger knife (Meeker and Rothrock).

29. (A) A Weitlaner is a self-retaining retractor (Meeker and Rothrock).

30. (D) A Hill is a rectal retractor (Meeker and Rothrock).

31. (C) A Webster needle holder is found in a basic plastic surgery instrument set (Meeker and Rothrock).

32. (B) The kidney pedicle containing the major blood vessels is isolated and doubly clamped with a Herrick,

Satinsky, or Mayo pedicle clamp (Meeker and Rothrock).

33. (A) Uterine dilators are Hank uterine dilators (Meeker and Rothrock).

34. (B) A lesion detected by a mammogram can be localized by the insertion of a needle(s) or a wire that is inserted through a needle. Once the suspected area is identified, the patient is sent to the OR for a biopsy. After biopsy, the specimen can be sent back for mammography validation before pathological examination (Meeker and Rothrock).

35. (D) Randall stone forceps are available in various angles and are used to remove stones from inaccessible areas (Meeker and Rothrock).

36. (A) Instrumentation for splenectomy is a basic laparotomy plus two, large right-angled pedicle clamps, long instruments, and hemostatic materials or devices (Meeker and Rothrock).

37. (A) Two blunt nerve hooks are required on a vagotomy setup (Meeker and Rothrock).

- 38. (A)** In an exploration of the common bile duct, a drainage T-tube is placed into the common bile duct. It is used to confirm successful evacuation and patency of the ducts and stays in place as a drain (Fortunato).
- 39. (D)** Prosthetic devices are of stainless steel and Teflon. Microsuctions are used. A speculum provides view (Meeker and Rothrock).
- 40. (A)** Cochlear implantation is the placement of an electrode device in the cochlea in deaf people. Candidates should have a history of lingual skills before becoming deaf. The device receives sound and emits electrical impulses into the cochlea and along the acoustic nerve. Sound interpretations are taught to the patient postoperatively (Meeker and Rothrock).
- 41. (B)** A Ballenger swivel knife is used in nasal surgery. An anesthesia setup, bayonet forceps, an Asch septum-straightening forceps, a straight hemostat, impregnated gauze, packing, a splint, and adhesive tape are prepared for a nasal fracture, closed reduction (Meeker and Rothrock).
- 42. (A)** A bayonet forceps is used to introduce sponges

into the nose (Meeker and Rothrock).

- 43. (C)** The Potts tissue forceps is a fine forceps associated with vascular and fine intestinal surgery. Nasal surgery requires, intranasally, an angled forceps such as the bayonet forceps, a Freer elevator, and a fine Frazier suction tube (Meeker and Rothrock).
- 44. (B)** Esophageal dilators (Bougies) may be on an esophagoscopy setup (Meeker and Rothrock).
- 45. (D)** A Jameson hook is used in eye surgery. The Yankauer suction, Hurd dissector and pillar retractor, and tongue depressor are all found in a tonsil set (Meeker and Rothrock).
- 46. (D)** A tissue expander stretches normal tissue to accommodate a breast prosthesis, used postmastectomy. The expander is placed in a created pocket and exchanged for a permanent prosthesis after desired expansion has occurred (Meeker and Rothrock).
- 47. (B)** Mandibular and maxillary fracture reduction is most often accomplished by applying arch bars to the maxillary and mandibular teeth for immobilization in

order to restore the patient's preinjury dental occlusion (Meeker and Rothrock).

- 48. (C)** The Alexander periosteotome, Doyen raspatory, and Stille shears are all instruments required to remove a rib. A Heaney clamp is a hemostatic clamp used in gynecologic surgery (Meeker and Rothrock).
- 49. (B)** Randall stone forceps are part of a kidney instrument set (Meeker and Rothrock).
- 50. (A)** A Sarot is a bronchus clamp (Association of Surgical Technologists).
- 51. (B)** An intra-aortic balloon pump (IPB) is not necessary. Fluoroscopy and a defibrillator are required plus vascular dissecting instruments, tunneling instrument, pacemaker and electrodes, introducer set, and an external pacemaker (Meeker and Rothrock).
- 52. (C)** A permanent pacemaker initiates atrial or ventricular contraction or both. The most common indications are complete heart block bradyarrhythmias (Meeker and Rothrock).
- 53. (A)** Harrington rods are internal splints—the

distraction rods placed concave to the curve and the compression rods on the convex side (Meeker and Rothrock).

- 54. (C)** Skeletal traction is the pulling force exerted to maintain proper alignment or position. It is applied directly on the bone following insertion of pins, wires, or tongs placed through or into the bone. Traction is applied by pulleys and weights to establish and maintain direction until fracture reunites (Fortunato).
- 55. (A)** For a forearm or lower leg, a Kirschner wire or a Steinmann pin is drilled through the bone distal to the fracture site. Traction is applied (Fortunato).
- 56. (A)** During orthopedic surgery, the mobile image intensification, also referred to as fluoroscopy or X-ray image, allows viewing of the case progression (Meeker and Rothrock).
- 57. (B)** The myelogram outlines the spinal subarachnoid space and shows distortions of the spinal cord or dura sac by means of an injection of contrast media (Meeker and Rothrock).
- 58. (D)** Sachs, Frazier, and Adson are metal suction tips

that suck and also conduct coagulation. Gardner and Mayfield are skull clamps and part of a neuro headrest setup (Meeker and Rothrock).

59. (A) An antigravity suit applied before positioning may help prevent air embolism and assist in maintaining blood pressure (Meeker and Rothrock).

60. (B) After wound closure, a Logan's bow is applied to the cheeks with tape strips to relieve tension on the incision and to splint the lip. It is a curved metal frame (Fortunato, Meeker and Rothrock).

61. (C) A Cloward is the removal of anterior cervical disk with fusion using Cloward instruments. It entails removal of disk fusion of the vertebral bodies and the use of bone dowels for the fusion obtained from the patient's iliac crest (Meeker and Rothrock).

62. (D) A Beaver knife handle is found on the instrumentation for lens procedures in the eye (Meeker and Rothrock).

63. (C) Skeletal traction requires the use of sterile supplies (traction bow, pins, and drills) (Meeker and Rothrock).

- 64. (D)** A Leyla–Yasargil is a self-retaining retractor. The others are aneurysm clips (Meeker and Rothrock).
- 65. (A)** A Pereyra or a Stamey are used for bladder neck suspensions to correct urinary stress incontinence. It is a ligature carrier and is inserted through a suprapubic incision (Meeker and Rothrock).
- 66. (B)** Extracorporeal shock wave lithotripter (ESWL), a noninvasive procedure, utilizes the lithotripter, which introduces shock waves through a liquid medium to disintegrate stones. Fluoroscopy and the image intensifier are used for visualization (Meeker and Rothrock).
- 67. (C)** The Omni–Tract is an adjustable urology perineal retractor system (Meeker and Rothrock).
- 68. (A)** A Mason–Judd is a bladder retractor (Meeker and Rothrock).
- 69. (A)** The Furlow inserter is used to place a penile implant (Meeker and Rothrock).
- 70. (D)** A Millin is a retropubic bladder retractor (Meeker and Rothrock).

- 71. (C)** The Gomco is a circumcision clamp used for infants. For adults, a plastic instrument set is used (Meeker and Rothrock).
- 72. (A)** A Humi cannula is used in gynecologic surgery for placement into the uterine cavity via the cervix for intraoperative chromotubation with diluted methylene blue or indigo carmine solution (Meeker and Rothrock).
- 73. (D)** The Hulka forceps may be introduced into the cervix to manipulate the uterus for better visibility (Meeker and Rothrock).
- 74. (A)** A central venous pressure catheter insertion is a minor operative procedure requiring sterile gloves, drapes, and instruments (Fortunato).
- 75. (C)** Bakes are a set of common duct dilators (Meeker and Rothrock).
- 76. (D)** A Steffee plate is an internal spinal implant fixation system used for treatment of fractures, spondylolisthesis, and idiopathic scoliosis of the thoraco-lumbar spine (Fortunato).

- 77. (C)** Crutchfield tongs are for skeletal traction (Fortunato).
- 78. (D)** The Bookwalter is a self-retaining retractor system (Meeker and Rothrock).
- 79. (A)** A Harrington is a large retractor (Meeker and Rothrock).
- 80. (B)** A Debakey is a long thoracic forcep (Fuller).
- 81. (B)** Bougie dilators are available in graduated sizes for esophageal dilation (Meeker and Rothrock).
- 82. (C)** The wire cutter scissor needs to accompany the patient to PACU post operatively in case of emergency and the mouth needs to be opened (Fuller).
- 83. (B)** Potts-Smith scissors are used to extend the arteriotomy incision during a carotid endarterectomy (Rothrock and Alexander).
- 84. (C)** [Figure 15-1A](#). A Stevens scissor is used for delicate plastic surgery such as a blepharoplasty (Fuller).

- 85. (B)** Hanks dilators are used on the uterus to dilate the cervix. Hegar dilators are also used to dilate the cervix. They are not pictured. Van Buren dilators are used to dilate the male urethra (Rothrock and Alexander).
- 86. (C)** Bakes dilators are used on the common bile duct to open and expand the duct to allow passage of bile from the liver. Bougies are esophageal dilators and Garrette dilators are used to dilate vessels (Rothrock and Alexander).
- 87. (A)** The Bookwalter is used to retract large abdominal wounds. It is a self-retaining retractor that attaches to the OR table. All individual pieces need to be included in the count (Rothrock and Alexander).
- 88. (C)** The [Figure 15-4D](#) is the finechetto. It is a chest/rib spreader. Other chest spreaders include the Burford, the Ankeney. They are not pictured but look very similar (Rothrock and Alexander).
- 89. (B)** The retractor commonly used in abdominal surgery and mostly pelvic procedures (GYN) is the O'Connor/O'Sullivan retractor (Rothrock and Alexander).

- 90. (C)** The Balfour is a self-retaining retractor used for retraction of a large abdominal wound. It has multilateral blades and a wide center blade. The set also includes the frame and a wing nut (Rothrock and Alexander).
- 91. (D)** The Ellik evacuator is a double glass bowl and bulb with an adapter tip. It is used to remove tissue segments/blood clots from the bladder. A microvasive evacuator is does the same thing but is disposable (Rothrock and Alexander).
- 92. (B)** The three-way Foley catheter is used for intermittent or continuous bladder irrigation (Rothrock and Alexander).
- 93. (C)** Both the two-way and the three-way Foley catheters are the most common indwelling catheters. The Foley has a balloon at one end and is used to hold the catheter in place. A large-mL Foley catheter would be used postoperatively for a tamponade (used to apply pressure against a tissue opening) example would be following a TURP (Rothrock and Alexander).
- 94. (A)** Two-way Foley 5 cc is used for urinary drainage.

One port is used to inflate the balloon and the other hooks to the drainage bag. A common non-retaining urinary catheter is a Robinson red rubber catheter (Rothrock and Alexander).

- 95. (B)** [Figure 15-5B](#) is a Toomey syringe. It aspirates specimens and blood clots from the bladder. It is often used to check for bleeding following a TURP. Fluid is injected into the bladder with a Toomey syringe and then aspirated out of the bladder with the Toomey syringe checking the color of the fluid (Rothrock and Alexander).
- 96. (B)** The Auvard speculum provides retraction of the posterior vaginal wall. The blade is placed into the vaginal vault and the weight of the speculum allows it to hang in place (Rothrock and Alexander).
- 97. (C)** The instrument in [Figure 15-6C](#) is a Jorgenson dissecting scissor commonly found on the GYN tray. A Jarit is a retractor used to retract small shallow wound edges (Rothrock and Alexander).
- 98. (B)** [Figure 15-6B](#) is the Hulka tenaculum. It is used for grasping and holding. It is used to manipulate the uterus during laparoscopic examination of pelvic

structures. The probe is inserted into the cervical os and the sharp prong penetrates the anterior cervical lip (Rothrock and Alexander).

99. (C) The instrument in [Figure 15-6F](#) is a Bozeman uterine dressing forcep. It is used to place vaginal packing in the vagina following vaginal procedures. A simpson forcep is used to facilitate the fetal decent when the fetus is lodged in the birth canal. The ochsner is a curved kocker, a grasping penetrating clamp (Rothrock and Alexander).

00. (D) A Phaneuf is a hysterectomy instrument used to clamp vessels and uterine ligaments used during a hysterectomy. The Jacobs vulsellum is used to grasp the anterior lip of the cervix for manipulation. The Schroeder is a single toothed tenaculum used to grasp the cervix (Rutherford).

01. (B) The instrument in [Figure 15-6E](#) is the Graves vaginal speculum. It is used to retract the anterior and posterior walls. The Eastman is a lateral vaginal retractor and the Young anterior retractor is a prostate retractor used in prostate surgery (Rothrock and Alexander).

- 02. (C)** A Bugbee electrode is used to coagulate small areas usually following a bladder biopsy. It is also the working element (Rothrock and Alexander).
- 03. (D)** The [Figure 15-7B](#) is the loop electrode. It is used for resection and coagulation of the prostate and bladder tissue during transurethral procedures. The ball loop electrode is used for coagulation of a larger surface area. Example is the bladder. Randall forceps are used to grasp renal stones and common bile duct stones (Rothrock and Alexander).
- 04. (C)** A T-tube is inserted into the bile duct for drainage of bile. The T-tube is a type of passive drain (Rothrock and Alexander).
- 05. (B)** A Fogarty embolectomy catheter would commonly be found on a vascular setup. It is the method of removing thrombi (Rothrock and Alexander).
- 06. (B)** The instrument in [Figure 15-9B](#) is a Duval lung forcep. It is used to grasp and hold lung tissue (Rothrock and Alexander).
- 07. (A)** The instrument in [Figure 15-9A](#) is a Sarot bronchus clamp. Is used to hold and occlude the

bronchus while stapling during a lung procedure. A cooley is used to clamp deep anatomical vessels. The Javid carotid artery clamp is used to secure the Javid shunt in the carotid artery and Potts–Smith are used to grasp and hold tissue (Rothrock and Alexander).

08. (D) The statinsky vena cava clamp has the jaws of the Debakey design. It is used to encircle the superior and the inferior vena cava before placement of umbilical tape around the vessel (Rothrock and Alexander).

09. (D) [Figure 15-10A](#) is a Bethune rib cutter. This heavy shear has straight cutting blades. [Figure 15-10C](#) is the Gluck rib shear. The outside blade covers the rib and the inside blade cuts down. Another common rib cutter is the Sauerbruch (not pictured) A patient's anatomy as well as which rib is being excised determines which rib cutter will be used (Rothrock and Alexander).

10. (C) The instrument in [Figure 15-10B](#) is the Davidson scapula retractor. It is used to retract the scapula and expose the ribs during thoracic entry and closure. The Allison lung retractor looks like a whisk and is used to retract lung tissue (not pictured). The Cooley arterial retractor is used to retract the atrium during a mitral valve procedure (Rothrock and Alexander).

- 11. (C)** The forceps in [Figure 15-11A](#) are Randall stone forceps. They are used to grasp stones in the biliary system. They come in different intensities of curvature (Rothrock and Alexander).
- 12. (A)** This biliary catheter is used to retrieve stones from the common bile duct (Rothrock and Alexander).
- 13. (D)** The red Robinson catheter is the most common nonretaining catheter. A Fogarty embolectomy catheter is used to remove thrombus from vessels and a Malecott is a self-retaining urethral catheter. Instead of using a balloon, the tip of the Malecott has either two or four wings that expand out to hold it in place (Rothrock and Alexander).
- 14. (D)** The instrument in [Figure 15-12A](#) is a Hurd dissector. It is used to retract the soft palate for oral procedures and to dissect tonsil tissue. [Figure 15-12B](#) is a mouth gag used to retract the mouth open for exposure of the oral cavity. Another commonly used mouth gag used is the Jennings mouth gag (Rothrock and Alexander).
- 15. (D)** The instrument in [Figure 15-13A](#) is a Kerrison rongeur. It is used to excise the lamina and create

access to the disc. It is used during a spine procedure. They come up biting, straight, and down biting.

16. (B) The pituitary is used to remove the herniated disc. A Taylor spinal retractor is used for wound retraction during lumbar spine procedures (Rothrock and Alexander).

17. (D) The Leksell rongeur is used to remove pieces of bone and soft tissue and is also used to remove the spinous process during a laminectomy (Rothrock and Alexander).

18. (A) This instrument is called the Scoville nerve root retractor. It is used to retract the dura and the nerve root. The shaft can be straight or angled. Cobb curettes are used to scrape bone during spine surgery. Cobb ring curettes are used to strip muscle and peritoneum off of bone (Rothrock and Alexander).

19. (B) [Figure 15-14B](#) is a blunt grasper which is used for grasping and manipulating organs causing minimal trauma and these graspers are often used on tissue that is going to be removed (Rothrock and Alexander).

20. (A) The Maryland dissector is a curved with fine

tapered jaws with horizontal serrations running the length of its jaws. It is used for fine dissection and separation of thin adventitial (Rothrock and Alexander).

- 21. (C)** [Figure 15-14D](#) is the endo clip applier. It is used for occluding vessels or other tubular structures. It comes in various titanium clip sizes from 5 to 10 mm and in different size lengths (Rothrock and Alexander).
- 22. (B)** Endoscopic scissors are used to cut and dissect tissues, ducts, vessels, and suture material. They have a rounded blunt tip with curved blades (Rothrock and Alexander).
- 23. (D)** [Figure 15-14F](#) is a suction irrigator, which is used to irrigate and aspirate fluid and debride from the surgical site. It is a hollow suction tube attached to a combination tubing that has a suction valve and an irrigation valve (Rothrock and Alexander).
- 24. (C)** The Kleppinger is a paddle tip forcep that attaches to a bipolar cord used to grasp tissues and vessels between the jaws and stepping on the foot pedal during laparoscopic procedures (Fuller).

- 25. (B)** The endo-fan retractor is used for elevation, retraction, and mobilization of organs and tissues and provides optimal visualization of the surgical field (Rothrock and Alexander).
- 26. (A)** During a repair of an inguinal hernia, using the TEP approach, the instrument used is a balloon expander. It is inserted into an incision and inflated with air or normal saline. The balloon dissector is then removed and is maintained with gas insufflations (Rothrock and Alexander).
- 27. (D)** [Figure 15-14J](#) shows common laparoscopic instruments that are commonly used on all laparoscopic surgeries (Rothrock and Alexander).
- 28. (C)** EEA or end-to-end stapler has a circular double row of staples and a knife blade within the instrument which resects excess tissue, and creates a circular anastomosis. The LDS is used for ligation and division of blood vessels and other tissues during abdominal GYN and thoracic procedures. It is commonly used in gastrointestinal surgery to ligate and divide the greater omentum and mesentery (not pictured) (Rothrock and Alexander).

- 29. (D)** The thoracoabdominal staple gun is used to transect and resect. It has a double or triple staggered row of staples commonly used in lung and abdominal surgery (Rothrock and Alexander).
- 30. (B)** The gastrointestinal anastomosis stapling device is used for resection and anastomosis. It provides two rows of double staggered staples and simultaneously divides tissue between them (Rothrock and Alexander).

CHAPTER 16

Equipment and Supplies

Questions

1. Which graft must be obtained with a dermatome?

- (A) Split-thickness mesh graft
- (B) Full-thickness Wolfe graft
- (C) Free myocutaneous graft
- (D) Full-thickness pinch graft

2. A Cavitron unit is used for

- (A) cyclodialysis
- (B) photocoagulation
- (C) phacoemulsification
- (D) cryotherapy

3. The power source for Hall's power equipment is

- (A) carbon dioxide
- (B) nitrous oxide
- (C) nitrogen
- (D) electricity

4. In what surgery would a small fragment compression

set be used?

- (A) Hip fracture
- (B) Femoral fracture
- (C) Pelvic fracture
- (D) Olecranon fracture

5. A permanent pacemaker operates on a pulse generator powered by

- (A) nitrogen
- (B) titanium
- (C) electricity
- (D) lithium

6. Which item is an air drill?

- (A) Reese
- (B) Padgett–Hood
- (C) Hall
- (D) Brown

7. Hypothermia is employed in cardiac surgery

- (A) to reduce oxygen consumption
- (B) to reduce elevated temperature
- (C) to slow metabolism
- (D) to induce ventricular fibrillation

8. Which item is NOT a component of a cardiopulmonary bypass system?

- (A) Oxygenator
- (B) Heat exchanger
- (C) Ventricular fibrillator
- (D) Pump

9. Which movement in a power instrument drills holes or inserts screws, wires, or pins?

- (A) Rotary movement
- (B) Reciprocating movement
- (C) Oscillating movement
- (D) Alternating movement

10. The power source for the Drill is

- (A) electricity
- (B) fiberoptic bundles
- (C) ultrasonic power
- (D) compressed nitrogen

11. The power source for air-powered dermatomes is

- (A) compressed nitrogen
- (B) nitrous oxide
- (C) air

(D) Either A or C

12. Suction tubing should be processed in the following way

(A) residual of distilled water in lumen, steam sterilize, tubing coiled

(B) residual of saline in lumen, ethylene oxide sterilization (ETO), tubing coiled

(C) lumen dried thoroughly, ETO, tubing banded

(D) Either A or B

13. The suction tip that is right angled and is used for small amounts of fluid such as in brain surgery is

(A) Poole

(B) Ferguson–Frazier

(C) Yankauer

(D) Tungsten

14. Which suction tip has an angle and is used in the mouth or throat?

(A) Ferguson

(B) Ferguson–Frazier

(C) Poole

(D) Yankauer

15. Each of the following steps can assist in the immediate determination of intraoperative blood loss EXCEPT

- (A) visual inspection of blood in sponges
- (B) measurement of blood in sponges by weighing
- (C) estimation of blood in suction container
- (D) complete blood count

16. When using a cell saver for autologous blood transfusion, the blood is suctioned through a double lumen tubing and is

- (A) heparinized
- (B) homogenized
- (C) sterilized
- (D) water-bathed

17. During orthopedic surgery the suction tubing should be

- (A) clamped off or kinked until needed
- (B) cleared frequently
- (C) sterilized with instrument sets
- (D) attached to a scavenging system

18. Which type of surgery would require several patent suction cannulas and suction often controlled by a foot pedal?

- (A) Gynecologic
- (B) Thoracic
- (C) Urologic
- (D) Ear, nose, and throat (ENT)

19. When suctioning in neurosurgery a precaution taken is to

- (A) prepare one reserve canister
- (B) separate cells for study
- (C) avoid applying vacuum directly on brain or neural tissue
- (D) avoid evacuating cerebrospinal fluid

20. A tourniquet is utilized

- (A) only in lower extremity bleeding
- (B) only when hemorrhage is not controlled by other methods
- (C) in all venous bleeding
- (D) in all arterial bleeding

21. The proper setting for a tourniquet applied to an arm is

- (A) 100–200 mm Hg
- (B) 250–300 mm Hg
- (C) 350–450 mm Hg

(D) 400–500 mm Hg

22. Exsanguination of a limb before tourniquet inflation is accomplished with wrapping the elevated extremity with

- (A) Kling
- (B) Esmarch
- (C) Stockingette
- (D) Webril

23. The amount of pressure used to inflate a tourniquet depends on all of the following EXCEPT

- (A) patient's age
- (B) size of extremity
- (C) depth of surgical incision
- (D) systolic blood pressure

24. A regional block that uses the tourniquet is a/an

- (A) Bier block
- (B) intrathecal block
- (C) peridural block
- (D) field block

25. The tourniquet is contraindicated if

- (A) patient's circulation to distal part of extremity is poor
- (B) patient is elderly
- (C) patient is obese
- (D) patient has epidural anesthesia

26. Which action drains venous blood during tourniquet application?

- (A) Elevate extremity after tightening tourniquet
- (B) Ascertain extremity remains at body level as tourniquet is tightened
- (C) Elevate extremity before tightening tourniquet
- (D) Lower the extremity to below body level as tourniquet is tightened

27. At what point should the surgeon be informed of the time of tourniquet application?

- (A) After 15 minutes, then every 5 minutes
- (B) After 1 hour, then every 15 minutes
- (C) After 2 hours, then every hour
- (D) After 3 hours, then every 15 minutes

28. When would the use of Esmarch be contra-indicated?

- (A) Patient has had previous anesthesia
- (B) Patient has had recent injury

- (C) Patient has had recent cast
- (D) Both B and C

29. Which agent is NOT used to inflate a pneumatic tourniquet?

- (A) Nitrous oxide
- (B) Air
- (C) Oxygen
- (D) Freon

30. A precaution necessary when using a pneumatic tourniquet is

- (A) limb must be continually elevated
- (B) tourniquet time must not exceed 20 minutes
- (C) solutions must be prevented from pooling under tourniquet
- (D) inflation is done before prep and draping

31. In which procedure would a tourniquet be contraindicated?

- (A) Tendon repair, child
- (B) Arthroscopy, adult
- (C) Bunionectomy
- (D) Gangrenous toe amputation

32. The following statements regarding a grounding plate for electrosurgery are true EXCEPT

- (A) the plate must have good contact with the patient's skin
- (B) the plate must be lubricated with electrosurgical gel
- (C) the plate must be placed directly over a bony prominence
- (D) the grounded pathway returns the electrical current to the unit after the surgeon delivers it to the operative site

33. A grounding pad is not required for the electrocautery in

- (A) a cutting current setting
- (B) a coagulation current setting
- (C) a monopolar unit
- (D) a bipolar unit

34. The inactive electrode of the cautery is the

- (A) ground pad
- (B) electrocautery pencil
- (C) cable connecting pad to pencil
- (D) blade tip pencil

35. The electrical circuit of the electrocautery when

- (A) current flows from generator to inactive electrode, through tissue, and back to generator
- (B) current flows from active electrode to generator, to tissue, and return
- (C) current flows to and from the generator to patient via the active electrode
- (D) current flows to generator to active electrode, through tissue, and back to generator via the inactive electrode

36. Why must the electrocautery tip be kept clean?

- (A) To ensure electrical contact effectiveness
- (B) To avoid fire via accidental drape ignition
- (C) To prevent burn injuries to staff
- (D) To prevent circuit overload

37. In electrosurgery, “buzzing” refers to

- (A) coagulation of vessel via a metal instrument touching the active electrode
- (B) coagulation of tissue via a metal instrument touching the inactive electrode
- (C) cutting current
- (D) blended current (cutting and coagulating simultaneously)

38. Which electrosurgical unit provides precise control of the coagulated area?

- (A) Monopolar
- (B) Blended
- (C) Bipolar
- (D) Bovie

39. Which condition is MOST acceptable when using electrocautery?

- (A) Ground pad placed on scar or hairy area
- (B) Ground pad placed on patient's forearm
- (C) Ground pad placed on skin over metal implant
- (D) Ground pad placed close to operative site

40. The active electrode on the electrocautery is the

- (A) dispersive electrode
- (B) power unit
- (C) grounding pad
- (D) tip

41. A cautery would not be used

- (A) when Betadine skin prep is used
- (B) in cases requiring irrigation
- (C) in neck or nasopharynx surgery if nitrous oxide is

used

(D) in hernia repair if an epidural is used

42. Why are only moist sponges utilized during electrocautery use?

(A) To prevent snagging of sponges on a cautery tip

(B) To prevent fire

(C) To reflect beam

(D) None of the above

43. Fulguration is utilized primarily in _____ surgery.

(A) ENT

(B) gynecologic

(C) thoracic

(D) transurethral resection (TUR) and prostate operations

44. When working in the bladder, why is more or higher electrical current necessary during cautery use?

(A) More current is needed when working in solution

(B) Bladder tissue is tougher

(C) High voltage arcing requires it

(D) Eschar formation is to be avoided

45. Fulguration via the resectoscope is accomplished by

the use of a/an _____ tip.

- (A) electrode
- (B) ball
- (C) blade
- (D) needle

46. A direct visualization of the common bile duct is done by means of a/an

- (A) cholangiograph
- (B) Fogarty catheter
- (C) choledochoscope
- (D) operative microscope

47. Fiberoptic lighting is

- (A) a cool light
- (B) made of plastic fibers
- (C) of low intensity
- (D) powered by battery

48. Complications can occur during endoscopy, such as

- (A) infection
- (B) bleeding
- (C) perforation
- (D) Both B and C

49. An endoscopy procedure that does not require a sterile set up is

- (A) laparoscopy
- (B) bronchoscopy
- (C) arthroscopy
- (D) mediastinoscopy

50. All are precautions when handling fiberoptic cables EXCEPT

- (A) light cables should be dropped or swing free when carried
- (B) cables are coiled loosely, no kinking
- (C) heavy items are not laid on cables
- (D) cables are only gas sterilized

51. Fiberoptic cable integrity is questionable when

- (A) illumination is bright
- (B) dark spots are evident
- (C) tubing has been coiled
- (D) tubing is scratched

52. When using a fiberoptic, burns and fires are prevented by

- (A) cable is kept away from drapes when

disconnected from endoscope

(B) personnel should not lean on cable end that is disconnected but is still on

(C) cable end is kept on a moist towel when disconnected from endoscope

(D) all of the above

53. A sterilant that is used on endoscopes that is bactericidal, fungicidal, and sporicidal in 20–30 minutes processing time is

(A) Metaphen

(B) aspartic acid

(C) peracetic acid

(D) ammonium chloride

54. Which statement is true regarding a STERIS system for endoscope sterilization?

(A) Only one scope or a few instruments can be processed in a cycle

(B) It is not sporicidal

(C) The processing time is lengthy

(D) It is very costly

55. The endoscope that provides a view of the middle of the thorax, between the two pleural sacs is

- (A) bronchoscope
- (B) laryngoscope
- (C) thoracoscope
- (D) mediastinoscope

56. Loupes are used for

- (A) tissue retraction
- (B) magnification
- (C) hemostasis
- (D) patient transfer

57. Resolving power of an operating microscope means

- (A) the ability to discern detail
- (B) the ability to enlarge the image
- (C) the adaptation of operative procedure to individual patient requirements
- (D) the ratio of image size on viewer's retina with and without magnification

58. Which item in the optical lens system is responsible for magnification?

- (A) Oculars
- (B) Paraxial illuminators
- (C) Objective lens
- (D) Both A and C

59. The range of focal lengths of the objective lenses in the operating microscope is

- (A) 0–100 mm
- (B) 100–200 mm
- (C) 100–400 mm
- (D) 5–25 mm

60. A continuously variable magnification system is afforded to the eye surgeon by the

- (A) broadview viewing lens
- (B) microadapter
- (C) zoom lens with foot control
- (D) couplings

61. The purpose of the “slit” lamp in eye surgery is

- (A) defining depth perception
- (B) focusing ability
- (C) magnifying power
- (D) discerning detail

62. The operating microscope that visually employs fiberoptics for its light source is

- (A) halogen
- (B) tungsten

- (C) coaxial illuminators
- (D) paraxial illuminators

63. Care of the microscope would include all of the following EXCEPT

- (A) damp dust external surfaces with detergent–disinfectant before use
- (B) damp dust lenses with detergent–disinfectant before use
- (C) enclose in an antistatic plastic cover when not in use
- (D) clean casters before each use

64. The purpose of the beam splitter in an operating microscope is to

- (A) coincide the assistant's field of view with the surgeon's
- (B) increase light intensity
- (C) decrease vibration
- (D) narrow the beam of light

65. The colpomicroscope affords a view of the

- (A) fallopian tube
- (B) intraperitoneal structures
- (C) cervix

(D) uterine endometrium

66. The procedure employing the use of a self-retaining laryngoscope and microscope is called a _____.

- (A) indirect laryngoscopy
- (B) direct laryngoscopy
- (C) suspension microlaryngoscopy
- (D) laser microlaryngoscopy

67. The binocular microscope provides stereoscopic vision. This refers to

- (A) the view afforded by double eyepieces
- (B) the color projected on the field
- (C) the magnification capability
- (D) the illumination process

68. Which magnifying powers are available for the microscope eyepieces?

- (A) 1×, 2×, 3×, and 4×
- (B) 10×, 20×, 30×, and 40×
- (C) 10×, 12.5×, 16×, and 20×
- (D) 300 mm, 400 mm, 500 mm, and 600 mm

69. Which procedure is inappropriate when caring for optic lenses?

- (A) Blood, water, and irrigating solutions are removed with cotton tipped applicators and distilled water
- (B) Lens is always cleaned in a circular motion, beginning at the center
- (C) Oil or fingerprints are removed by soaking in solvent for 10 minutes and drying with a cotton ball
- (D) Lint or dust are removed with a lens brush or rubber bulb syringe

70. The OR bed may have a metal crossbar between the two upper sections which may be raised to elevate the

- (A) kidney
- (B) breast
- (C) gallbladder
- (D) Both A and C

71. Which item is also known as an “airplane support”?

- (A) Shoulder braces
- (B) Arch bar
- (C) Cranial headrest
- (D) Double arm board

72. Operative accessibility in thyroid surgery may be aided by the use of a/an

- (A) headrest
- (B) shoulder braces
- (C) arch bar
- (D) shoulder bridge

73. In which position would shoulder braces be indicated?

- (A) Reverse Trendelenburg
- (B) Extreme Trendelenburg
- (C) Fowler's
- (D) Kraske

74. A precaution necessary when using the kidney rests is

- (A) to press firmly but not too tightly against body
- (B) to pad well
- (C) to place the longer rest beneath iliac crest
- (D) All of the above

75. Chest rolls (bolsters)

- (A) secure position
- (B) minimize pressure on abdominal organs
- (C) facilitate respiration
- (D) minimize pressure on bony prominences

76. Sponges and towels used near the laser tissue impact site are kept wet in order to

- (A) prevent drying of tissue
- (B) prevent ignition of these materials by reflected beam
- (C) protect the instruments
- (D) absorb the gas produced

77. A laser plume is composed of

- (A) methane gas
- (B) carbonized particles, water, and odor
- (C) dry combustibles
- (D) gas vapor

78. When using lasers, nonreflective instrumentation

- (A) decreases accidental direct reflection of the laser beam to another area
- (B) decreases potential for infection
- (C) decreases explosibility
- (D) decreases short-circuiting of the laser

79. Which laser emission is primarily absorbed in tissue by hemoglobin or melanin?

- (A) CO₂
- (B) Argon
- (C) Nd–YAG

(D) Helium–neon

80. The fire extinguisher of choice for a laser fire is a/an

(A) water pressurized

(B) CO₂

(C) Halon

(D) dry chemical

81. In a surgical procedure employing the use of the laser, prep solution on the patient's skin should be pat-dried because

(A) pooled fluids can retain laser heat and subsequently burn tissue

(B) instrumentation cannot be exposed to prep solutions

(C) vapors can cause damage to the laser beam impact point

(D) laser retardant draping material must be placed on a thoroughly dry surface

82. Laser surgery performed in the rectal area should be preceded by

(A) suctioning of lower bowel to remove methane gas

(B) suctioning out of lower bowel contents

(C) packing the rectum with dry, counted sponges

(D) Both A and C

83. Ebonization refers to

- (A) escharing of tissue from thermal or chemical burn
- (B) coating of instruments to decrease reflectivity
- (C) removing of a growth or harmful substance
- (D) clumping together of cells as a result of interaction with antibodies

84. The use of each of the following items are measures employed to reduce laser-induced injuries EXCEPT

- (A) ebonized instruments
- (B) anodized instruments
- (C) plastic vaginal and rectal speculums
- (D) reflective drapes

85. When utilizing the laser, occupational exposure to surgical smoke via the skin, eye, and mucous membranes is best minimized by the use of

- (A) charcoal filters
- (B) copper shield
- (C) universal precautions
- (D) standard suction

86. Which specialty would employ the use of a slit lamp

and the laser?

- (A) Orthopedic
- (B) Urologic
- (C) Ophthalmic
- (D) ENT

87. The laser used primarily for port-wine stain lesions of the skin is the

- (A) argon
- (B) krypton
- (C) yttrium aluminum garnet (YAG)
- (D) ruby

88. People who are near the CO₂ laser impact area can guard against corneal injuries by

- (A) wearing amber-tinted lenses
- (B) wearing clear glass or plastic glasses with side guards
- (C) wearing green-tinted lenses
- (D) looking away from the energy source

89. Each of the following are measures used to control the effects of the laser plume EXCEPT

- (A) smoke evacuators

- (B) suction
- (C) high filtration masks
- (D) moistened drapes

90. Which endotracheal tube is contraindicated during laser surgery?

- (A) Flexible metal tube with external cuff attached
- (B) Polyvinyl chloride (PVC) tube
- (C) Red rubber tube wrapped with reflecting tape
- (D) Commercial laser endotracheal (ET) tube

91. What item should be on the scrub person's instrument table while the laser is in use?

- (A) Basin of sterile water or saline
- (B) Basin of sterile baking soda
- (C) Flame retardant sheets
- (D) Cotton blanket

92. The following statements regarding lasers are true EXCEPT

- (A) laser unit is protected from bumping against walls during movement
- (B) flammable materials should not be used near laser impact site
- (C) water or other solutions should not be placed on

laser unit

(D) laser unit is in “on” position during entire case

93. The laser used most commonly for retinal detachment, tear, or hole is

(A) krypton

(B) Nd–YAG

(C) argon

(D) CO₂

94. The tunable dye laser used to disintegrate kidney stones is the

(A) ESWL

(B) Candela

(C) CO₂

(D) Nd:–AG

95. A device used to correct and counteract internal bleeding conditions and hypovolemia is a/an

(A) CT

(B) IPB

(C) CVP

(D) MAST

96. Placement of a Levin tube would be in the

- (A) ear
- (B) large intestine
- (C) stomach
- (D) bladder

97. A sponge used in brain surgery is a/an

- (A) cottonoid patty
- (B) Kitner
- (C) impregnated gauze
- (D) porcine

98. The dressing used after nasal surgery is

- (A) collodion
- (B) moustache
- (C) pressure
- (D) telfa

99. Seamless tubular cotton that stretches to fit a contour and is used for padding is called a/an

- (A) Ace bandage
- (B) Webril
- (C) sheet wadding
- (D) stockinette

00. Which case would require the use of cottonoid strips?

- (A) Laminectomy
- (B) Tonsillectomy
- (C) Thorocotomy
- (D) Aortic aneurysmectomy

01. An item used for padding that has smooth and clingy layers is called

- (A) Webril
- (B) stockinette
- (C) telfa
- (D) gypsum

02. Rectal packing is made of

- (A) petroleum-treated gauze
- (B) heparin-treated gauze
- (C) antibiotic-treated gauze
- (D) telfa-treated gauze

03. An elastic adhesive bandage is

- (A) flexible collodion
- (B) Ace bandage
- (C) elastoplast
- (D) Scultetus binder

04. A dissecting sponge that is a small roll of heavy cotton tape is a

- (A) Kitner
- (B) peanut
- (C) tonsil
- (D) tape

05. A dissecting sponge made of gauze that is used to dissect or absorb fluid is called a

- (A) patty
- (B) tonsil
- (C) cottonoid
- (D) peanut

06. A temporary biologic dressing is

- (A) porcine
- (B) telfa
- (C) collagen
- (D) mesh

07. Which procedure would not require a pressure dressing?

- (A) Plastic surgery
- (B) Knee surgery

- (C) Radical mastectomy
- (D) Hysterectomy

08. A sponge that is cotton-filled gauze with a cotton thread attached is a

- (A) patty
- (B) tonsil
- (C) Kitner
- (D) peanut

09. Patties are

- (A) used dry
- (B) moistened with saline
- (C) moistened with water
- (D) moistened with silver nitrate solution

10. Which of the following can be a supplement to a subcuticular closure?

- (A) Skin staples
- (B) Swaged sutures
- (C) Stent fixation
- (D) Steri strips

11. A protective skin coating is accomplished with

- (A) tincture of benzoin
- (B) merthiolate
- (C) iodoform
- (D) Lugol's solution

12. A dressing that is held in place by long suture ends crisscrossed and tied is called a

- (A) passive
- (B) strip closure
- (C) proxi-strip
- (D) stent

13. The smallest diameter on a French scale is a

- (A) 3
- (B) 5
- (C) 7
- (D) 9

14. A stab wound is a separate small incision

- (A) close to operative site
- (B) medial to operative site
- (C) always above operative site
- (D) superior to operative site

15. A tube placed into the tympanic membrane to

facilitate aeration is the

- (A) myringotomy tube
- (B) stent tube
- (C) Robinson tube
- (D) plastipore tube

16. A common size chest tube is a

- (A) 3 Fr
- (B) 10 Fr
- (C) 30 Fr
- (D) 60 Fr

17. What type of catheter would facilitate the removal of small gallstones?

- (A) T-tube
- (B) Robinson
- (C) Fogarty
- (D) Rehfus

18. A catheter commonly used in a gastrostomy is a

- (A) mushroom
- (B) Rehfus
- (C) Cantor
- (D) Sengstaken–Blakemore

19. Which of the following is NOT a type of ureteral catheter tip?

- (A) Whistle
- (B) Olive
- (C) Braasch bulb
- (D) Pezzar

20. The drain that has a reservoir creating negative pressure to facilitate drainage is a

- (A) Penrose
- (B) hemovac
- (C) Levin
- (D) stent

21. All of the following statements are true of ureteral catheters EXCEPT that they

- (A) are made of flexible woven nylon or plastic
- (B) range in caliber from size 3 to 14 Fr
- (C) have graduated markings in centimeters
- (D) provide direct visualization of the bladder

22. Long-term or temporary ureteral drainage can be accomplished with a

- (A) Braasch bulb

- (B) Blassuchi
- (C) stent
- (D) Garceau

23. A central venous catheter is usually inserted into the

- (A) brachial vein
- (B) cephalic vein
- (C) femoral vein
- (D) external jugular vein

24. Which of the following is not used for urethral dilation?

- (A) McCarthy dilator
- (B) VanBuren sound
- (C) Hegar dilator
- (D) Phillips filliform and followers

25. A closed-wound suction system works by

- (A) positive pressure
- (B) negative-pressure vacuum
- (C) air displacement
- (D) constant gravity drainage

26. Why is a 30-cc bag Foley used after a transurethral resection (TUR) of the prostate?

- (A) Hemostasis
- (B) Decompression
- (C) Creation of negative pressure
- (D) Aspiration

27. The tube that collects bronchial washings is

- (A) Broyles
- (B) Lukens
- (C) Ellik
- (D) Toomey

28. Balloon angioplasty is accomplished with the use of a catheter.

- (A) Gruntzig
- (B) Gibbons
- (C) Garceau
- (D) Harris

29. A Pezzer is a

- (A) Foley catheter
- (B) bat-wing catheter
- (C) ureteral catheter
- (D) mushroom catheter

30. The three lumens of a Foley are used for inflation, drainage, and

- (A) prevention of urine reflux
- (B) access for sterile urine specimens
- (C) continuous irrigation
- (D) additional hemostasis

31. An image intensifier

- (A) is an X-ray machine
- (B) is a microscope
- (C) converts the X-ray beam into a fluoroscopic optical image
- (D) converts an X-ray image into film

32. Extracorporeal circulation refers to circulation

- (A) of blood outside of the body
- (B) through the muscular tissue of the heart
- (C) established through an anastomosis between two vessels
- (D) of blood through the whole body EXCEPT the lungs

33. The scoring system that assesses an infant's condition after birth is called a/an

- (A) Roentgen
- (B) Romberg
- (C) Apgar
- (D) colostrum

34. Which procedure records the electrical activity of the brain?

- (A) Electrocardiogram
- (B) Brain scan
- (C) Electromyogram
- (D) Electroencephalogram

35. An X-ray's photographic image is called a/an

- (A) ultrasound wave
- (B) magnetic image
- (C) roentgenogram
- (D) computerized tomography

36. Immobilization of the hip joints after surgery is accomplished by the use of

- (A) traction
- (B) abduction pillow
- (C) cast
- (D) compression device

37. All of the following are true of disposable chest drainage units EXCEPT

- (A) provides drainage collection from intrapleural space
- (B) maintains a seal to prevent air from entering the pleural cavity
- (C) provides suction control determined by water level
- (D) aids in reestablishing positive pressure in the intrapleural space

38. Which factor is not accomplished by chest drainage?

- (A) Drains fluid and air from pleural cavity
- (B) Provides water seal for gravity drainage
- (C) Suction controlled by level of water
- (D) Positive pressure reestablishment

39. A cast applied from the hips to the head, which is used to immobilize cervical fractures is a

- (A) Minerva jacket
- (B) body jacket
- (C) shoulder spica
- (D) cylinder

40. A motorized device whose action prevents venous stasis and reduces risk of deep-vein clotting in high risk patients is

- (A) pneumatic antishock garment
- (B) military antishock trousers (MAST)
- (C) Thrombo-embolic-deterrent stockings
- (D) sequential pneumatic compression boots

41. Which synthetic mesh may be used in the presence of infection?

- (A) Prolene
- (B) Gore-tex
- (C) Mersilene
- (D) None of the above

42. Mersilene mesh

- (A) cannot be resterilized
- (B) can be steam sterilized once, if unused but not soiled
- (C) can be resterilized, if soil is carefully washed off
- (D) can be cold soaked for 10 minutes

43. A common donor site for an autogenous bone graft is

- (A) femur
- (B) pelvis
- (C) ilium
- (D) ischium

44. The patient coming to the OR with rupture of esophageal varices may have a/an _____ in place to control bleeding.

- (A) Miller–Abbott
- (B) Franklin
- (C) Swan–Ganz
- (D) Sengstaken–Blakemore

45. Either a Foley, Mallecot, Pezzer, or Mushroom catheter can be inserted for

- (A) gastroscopy
- (B) gastrostomy
- (C) vagotomy
- (D) gastric bypass

46. The risks of cone biopsy are minimized by using the

- (A) cervitome
- (B) cold knife
- (C) scalpel
- (D) CO₂ laser

47. Stereotactic surgery takes place in the

- (A) ear
- (B) eye

- (C) brain
- (D) nose

48. A blood flow detector is a

- (A) Doppler
- (B) Gruntzig
- (C) Moretz
- (D) Warren

49. A secondary video monitor is referred to as a/an

- (A) MAC
- (B) SMA
- (C) CAM-2
- (D) “slave”

50. Which catheter facilitates the infusion of chemotherapeutic drugs?

- (A) Hickman
- (B) Dorsey
- (C) Silverman
- (D) Huber

51. Total parenteral nutrition (TPN)

- (A) maintains patient’s nutrition

- (B) provides withdrawal site for blood samples
- (C) provides access route for chemo installation
- (D) records vital signs

52. An Ambu bag is a

- (A) container for specimens
- (B) bag for blood pressure apparatus
- (C) bag for blood transfusion
- (D) breathing bag

53. A blood warmer is used

- (A) to induce hypothermia
- (B) to aid in hemolysis
- (C) to maintain 89°F–105°F temperature
- (D) to eliminate microorganisms

54. Which is the most necessary item for a blood transfusion?

- (A) Blood warmer
- (B) Blood filter
- (C) Blood pressure cuff
- (D) Refrigerator

55. Each are measures to prevent heat loss in newborn, infant, or children in the OR EXCEPT

- (A) hypothermia blanket is prepared
- (B) water mattress is warmed
- (C) webril is wrapped on extremities
- (D) solutions for skin prep and intraoperative use are warmed

56. A setup that would include a 1000-cc bag of normal saline, sterile IV tubing, an IV pole, and a pressure bag is

- (A) splenectomy
- (B) choledochoscopy
- (C) thyroideotomy
- (D) ovarian cystectomy

57. A laminaria tent is used to

- (A) suction uterine contents
- (B) close cervix
- (C) dilate cervix
- (D) visualize uterus

58. In which procedure would be a radiant warmer be found?

- (A) Sterilization
- (B) Cesarean section

- (C) Blood transfusion
- (D) Ramstedt operation

59. The C-arm employs the use of

- (A) fluoroscope
- (B) carbon dioxide
- (C) cesium
- (D) creatine

60. Equate the radiation exposure in fluoroscopy as compared to that of a single X-ray.

- (A) The same exposure
- (B) 2:1
- (C) 5:1
- (D) 10:1

61. A PCA pump affords

- (A) patient-controlled pain relief
- (B) vital sign monitoring
- (C) infusion of antibiotics intravenously
- (D) heparinized solution intravenously

62. An example of a passive drain is

- (A) Jackson Pratt

- (B) Penrose
- (C) Hemovac
- (D) Proximal drain

63. Which drain is specifically used for drainage of bile?

- (A) Foley
- (B) T-tube
- (C) Jackson pratt
- (D) Cigarette drain

64. An example of a suction drain is:

- (A) Hemovac
- (B) Jackson pratt
- (C) Foley
- (D) Both A and B

65. What drain would commonly be used following a total hip arthroplasty?

- (A) Hemovac
- (B) Jackson Pratt
- (C) Penrose
- (D) Water seal drainage system

66. A water seal drainage system restores _____ pressure to the thoracic cavity

- (A) positive
- (B) negative
- (C) increased
- (D) decreased

67. When using a water seal drainage system, the collection unit must remain:

- (A) below the level of chest tube
- (B) equal to level of chest tube
- (C) above level of chest tube
- (D) no protocol applies

Answers and Explanations

- 1. (A)** After removal of the split-thickness mesh graft with dermatome, the graft is placed on a plastic dermacarrier, upside down. The mesher then cuts small parallel slits in the graft. This permits expansion to three times its original size (Meeker and Rothrock).
- 2. (C)** Phacoemulsification (the fragmentation of a lens by use of ultrasonic energy and its subsequent aspiration from the capsule) is accomplished by the use of a Cavitron unit (Meeker and Rothrock).
- 3. (C)** The power source is inert, nonflammable, and explosion-free gas. Compressed nitrogen is the power source for all air-powered equipment (Meeker and Rothrock).
- 4. (D)** To correct an olecranon fracture, small fracture compression screws and set, Kirschner wires, Steinmann pins, and figure-of-eight wire may be used along with small bone and tissue sets. The others require large bone sets (Meeker and Rothrock).
- 5. (D)** A permanent pacemaker has a pulse generator and

electrode–pulse generators are typically powered by lithium, which lasts 5–10 years. They are classified as fixed ventricular, demand, and physiologic (Meeker and Rothrock).

- 6. (C)** Hall is an air drill. Reese, Padgett–Hood, and Brown are all dermatomes (Meeker and Rothrock).
- 7. (A)** Hypothermia deliberately reduces body temperature to permit reduction of oxygen consumption by about 50% (Meeker and Rothrock).
- 8. (C)** The oxygenator, heat exchanger, and pump are the three components of a cardiopulmonary bypass system. To restart the heart after surgery, the need for a ventricular fibrillator would be additional (Meeker and Rothrock).
- 9. (A)** A powdered surgical instrument utilizing rotary movement to drill holes or insert screws, wires, or pins. Reciprocating movement cuts front to back, and oscillating cuts side-to-side. They can have a combination changed by adjusting controls (Fortunato).
- 10. (D)** The power source for Drill is compressed nitrogen. This drill is known for its precision cutting, shaping, and repair of bone (Meeker and Rothrock).

- 11. (D)** Dermatomes may be electric or air-powered with compressed nitrogen or air (Fortunato).

- 12. (A)** A residual of distilled water should be left in the lumen of any tubing to be sterilized by steam. Tubing should be coiled without kinks and disassembled from suction tips. Rubber bands prevent steam penetration (Fortunato).

- 13. (B)** A right-angled tube with a small diameter used for small amounts of fluid such as in brain, spinal, plastic, or orthopedic surgery is Ferguson–Frazier (Fortunato).

- 14. (D)** The Yankauer tonsil tip is a hollow tube, with an angle, used in the mouth and throat (Fortunato).

- 15. (D)** A blood count may take some time. However, visual inspection of blood in sponges, measurement of blood in the sponges by weighing them, and estimation of blood in the suction containers are immediate methods. When measuring the suction container, allowance must be made for the presence of other body fluids and irrigants. The scrub nurse estimates the amount of irrigant used by keeping track of amounts given on field (Fortunato).

- 16. (A)** In the cell saver, blood is suctioned, and an anticoagulant solution of heparinized saline or citrated dextrose mixes with blood at the tip of the tubing. It is filtered and separated, and red blood cells (RBCs) are washed, infused with saline, and go into a reinfusion bag (about 250 cc) (Fortunato).
- 17. (B)** Suction tubing must be kept open and collection containers changed as necessary to maintain suction for irrigation during operation (Fortunato).
- 18. (D)** In ENT surgery, wall suction must be available, including several patent cannulas. The degree of suction is variable and often is controlled by a foot pedal so that the surgeon has control of it for grasping and releasing an object (Fortunato).
- 19. (C)** Suction is necessary to evacuate blood, cerebrospinal fluid, and irrigating fluid for better visualization. A Ferguson–Frazier tip is used. Avoid applying vacuum directly on brain or normal neural tissue (Fortunato).
- 20. (B)** Apply a tourniquet only as a last resort when hemorrhage cannot be controlled by any other means. Tourniquets can cause irreparable vascular or

neurologic damage (Fortunato).

- 21. (B)** The average arm is 300 mm Hg. The average leg is 500 mm Hg (Fortunato).
- 22. (B)** While elevated, the extremity is wrapped distally to proximally with an Esmarch rubber bandage to exsanguinate the limb. The tourniquet is then inflated (Meeker and Rothrock).
- 23. (C)** The patient's age, the size of extremity, and the patient's systolic pressure are all factors to be considered when applying a tourniquet. The depth of the incision is of no consequence (Meeker and Rothrock).
- 24. (A)** A Bier is a regional intravenous injection of a local to an extremity below level of the tourniquet. The extremity remains painless as long as the tourniquet is in place (Fortunato).
- 25. (A)** A tourniquet should never be used when direct circulation in the distal part of an extremity is impaired. It could cause tissue injury, shutting off of blood supply to the part below causing gangrene and loss of the extremity (Fortunato).

- 26. (C)** Elevate an arm or leg to encourage venous drainage before tightening a tourniquet (Fortunato).
- 27. (B)** Tourniquet application and removal time is recorded. The surgeon is informed when it has been on for 1 hour and then every 15 minutes (Fortunato).
- 28. (D)** If the patient has had a traumatic injury or casting, danger exists that thrombi might be in vessels because of injury or stasis of blood. These could become dislodged and result in emboli (Fortunato).
- 29. (A)** Air, oxygen, freon, or ambient air are used. Nitrous oxide is an anesthetic gas (Fortunato).
- 30. (C)** Caution must be taken to prevent solution from pooling under a tourniquet. Apply tourniquet and drape position before tourniquet is inflated (Fortunato).
- 31. (D)** Tourniquets are not used if circulation is compromised. Arthroscopy, bunionectomy, and tendon repair on a child would be indications for use (Fortunato).
- 32. (C)** The ground plate or inactive electrode is

lubricated with an electrosurgical gel and is placed in good contact with a fleshy, nonhairy body surface. It should not be placed over a bony prominence. The grounded pathway returns the electrical current to the unit after the surgeon delivers it to the operative site (Fortunato).

- 33. (D)** Bipolar units provide a completely isolated output with negligible leakage of current between the tips of the forceps. The need for a dispersive pad is eliminated (Meeker and Rothrock).
- 34. (A)** The dispersive pad is the inactive electrode. It is placed as close to the operative site as possible, on the same side of the body as the operative site and over a large muscle if possible. Bony prominences and scar tissue should be avoided. Good contact is essential (Meeker and Rothrock).
- 35. (D)** To complete the electric circuit to coagulate or cut tissue, current must flow from a generator (power unit) to an active electrode, through tissue, and back to generator via the inactive electrode (Fortunato).
- 36. (A)** The tip is kept clean, dry, and visible. Charred or coagulated tissue is removed by wiping with a tip

cleaner or scraping with the back of a knife blade. Charred tissue on the electrode absorbs heat and decreases effectiveness of current (Fortunato).

- 37. (A)** Vessels are coagulated when any part of the metal instrument is touched with the active electrode. It is known as buzzing (Fortunato).
- 38. (C)** The bipolar cautery provides extremely precise control of the coagulated area (Fortunato).
- 39. (D)** The ground plate should be as close as possible to the site where the active electrode will be used to minimize current through body (Fortunato).
- 40. (D)** The sterile active electrode directs the flow of current to the operative site. Style of the electrode tip may be blade, loop, ball, or needle. It may be attached to a pencil-shaped handle or incorporated into either a tissue-forceps or suction tube (Fortunato).
- 41. (C)** Electrosurgery is not used in the mouth, around the head, or in the pleural cavity when high concentrations of oxygen or nitrous oxide are used because of fire and explosion hazards (Fortunato).

- 42. (B)** Only moist sponges should be permitted on a sterile field while the electrosurgical unit is in use, to prevent fire (Fortunato).
- 43. (D)** In fulguration, sparks of high voltage current char the tissue producing eschar. It uses a high-frequency cutting current and is used primarily for transurethral resection (TUR) and prostate surgery (Fortunato).
- 44. (A)** More electric current is needed when working in solution, as in the bladder, than in the air. During bladder surgery, continuous irrigation is necessary to distend bladder for visualization and wash out debris (Fortunato).
- 45. (A)** Fulguration of a tumor is accomplished by use of a cutting electrode to destroy tissue. It both cuts and coagulates (Fortunato).
- 46. (C)** Choledochoscopy is direct visualization of the common bile duct by means of a choledocoscope introduced into the common bile duct. This takes the place of operative cholangiography and provides a means for stones difficult to remove (Meeker and Rothrock).

- 47. (A)** Fiberoptic lighting is an intense cool light that illuminates body cavities via a bundle of thousands of coated glass fibers. It is non-glaring (Fortunato; Meeker and Rothrock).
- 48. (D)** Two major complications of endoscopy are perforation and bleeding (Fortunato).
- 49. (B)** A bronchoscopy is considered surgically clean. The rest require a sterile setup (Fortunato).
- 50. (D)** Most cables are autoclaved but according to manufacturers directions only (Meeker and Rothrock).
- 51. (B)** A simple test for the integrity of the cable is to hold one end of the cable to a bright light and inspect the opposite end. Dark spots are an indication that some of the fibers are broken (Fortunato; Meeker and Rothrock).
- 52. (D)** Light is cold, meaning that the heat is not transmitted throughout scope and tissue is not damaged. The ends, however, can get hot and should be kept out of contact with patient and personnel skin. Keep cable away from drapes or place on moist towel to prevent burns and fires (Meeker and Rothrock).

- 53. (C)** Peracetic acid is bactericidal, fungicidal, and sporicidal. It is used for heat-sensitive items that can be cleaned and completely immersed. The process cycle is less than 30 minutes and especially good for endoscopes (Meeker and Rothrock).
- 54. (A)** Only one scope or a few instruments can be done in a cycle. It is sporicidal, the process is only 20–30 minutes, and it is cost effective (Meeker and Rothrock).
- 55. (D)** The mediastinoscope is used to view lymph nodes or masses in the superior mediastinum. The mediastinum contains all the thoracic viscera except the lungs (Meeker and Rothrock; Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 56. (B)** Loupes are glasses with telescopic lenses used for magnification in microvascular surgery and nerve repair (Meeker and Rothrock).
- 57. (A)** The ability to discern detail is known as resolving power or resolution (Fortunato).
- 58. (D)** The optical combination of the objective lens and the oculars determine the magnification of the

microscope (Fortunato).

- 59. (C)** Objective lenses are available in various focal lengths ranging from 100 to 400 mm with intervening increases by 25-mm increments. The 400 mm provides the greatest magnification (Fortunato).
- 60. (C)** A continuously variable system of magnification for increasing or decreasing images is possible with zoom lens, usually operated with a foot control to free surgeons' hands from the task (Fortunato).
- 61. (A)** The slit aperture permits a narrow beam of light to be brought into focus on the field. This slit image assists the surgeon in defining depth perception (relative distance of objects within the field) (Fortunato).
- 62. (C)** Usually fiberoptic, coaxial illumination provides intense, cool light. Paraxial illuminators contain tungsten or halogen bulbs (Fortunato).
- 63. (B)** Microscopes should be damp dusted before use. All external surfaces, except the lenses, are wiped with detergent–disinfectant solution. Casters are also cleaned. It is kept dust free with an antistatic cover

(Fortunato).

- 64. (A)** A beam splitter takes the image from one of the surgeon's oculars and transmits it through an observer tube; thereby, providing the assistant with an identical image of the surgeon's view (Fortunato).
- 65. (C)** The culpomicroscope illuminates and permits identification of abnormal cervical (ectocervical, lower cervical canal, and vaginal wall) epithelium to target for biopsies (Fortunato).
- 66. (C)** The laryngoscope becomes self-retaining by suspension in a special appliance placed over the patient's chest, thus enabling the surgeon freedom of his or her hands to use a microscope and perform procedures (Fortunato).
- 67. (A)** A microscope is a monocular or binocular. The binocular has two telescopes mounted side by side that gives stereoscopic vision (Meeker and Rothrock).
- 68. (C)** Eyepieces are interchangeable and are available in four magnifying powers: $10\times$, $12.5\times$, $16\times$, and $20\times$ (Meeker and Rothrock).

- 69. (C)** A, B, and D are appropriate techniques. Oil or fingerprints are removed with a solvent or lens-cleaning solution or 50% denatured alcohol; however, solvents should be used sparingly so that cemented surfaces are not destroyed (Meeker and Rothrock).
- 70. (D)** Some tables have a metal crossbar or body elevator between the two upper sections that can be raised to elevate a gallbladder or kidney (Fortunato).
- 71. (D)** A double arm board is sometimes called an “airplane support.” Both levels must be padded. It is used in lateral positioning (Fortunato).
- 72. (D)** The shoulder bridge (thyroid elevator) is a metal bar slipped under the mattress between the head (removed during placement) and body sections. This hyperextends the shoulder or thyroid area for accessibility (Fortunato).
- 73. (B)** Concave metal supports or shoulder braces are used to prevent the patient from slipping when the head of the table is tilted down, as in the Trendelenburg position (Fortunato).
- 74. (D)** The kidney rests provide position stability in

kidney position. They should not press too tightly against body, should be well padded, and the longer rest is beneath the iliac crest to minimize pressure on abdominal organs (Fortunato).

75. (C) Chest rolls (bolsters) elevate the chest to facilitate respiration (Fortunato).

76. (B) During surgery, such dry combustibles as sponges or towels, near the laser tissue impact site should be kept wet to prevent ignition (Meeker and Rothrock).

77. (B) Laser plume contains carbonized particles, water, and odor, thus adequate smoke evacuation is necessary to remove the potentially viable contaminants from the air (Meeker and Rothrock).

78. (A) Instrumentation used in the immediate vicinity of the laser tissue impact site should be nonreflective to decrease the chance of the laser beam bouncing off the surface and accidentally impacting another area (Meeker and Rothrock).

79. (B) The argon laser operates in the visible light region in the blue–green spectrum. It is easily delivered to the tissue through flexible fiber optics and can be

coupled to a microscope or hand piece. Argon laser energy is primarily absorbed in tissue by melanin and hemoglobin (Meeker and Rothrock).

- 80. (C)** A Halon fire extinguisher consisting of hydrogenated halocarbons is recommended for laser unit fires because it does not produce a residue and has low toxicity (Ball).
- 81. (A)** Prep solutions should be pat-dried because pooled fluids can retain the laser heat and subsequently burn the tissue (Ball).
- 82. (A)** The patient should be instructed to self-administer a preoperative enema to clean the lower bowel. The surgeon uses suction to evacuate any methane gas, which could cause a large bowel explosion fire. The lower rectal area is packed with wet, counted sponges to decrease methane gas from escaping into the surgical area and creating a fire hazard (Ball).
- 83. (B)** Laser instruments can be ebonized to decrease the chance of laser beam reflection when used near impact site. Instruments are coated with a substance to decrease reflectivity, often producing a black surface (Ball).

- 84. (C)** Plastic vaginal and rectal specula should not be used because they can burn or melt when struck by the laser beam. Ebonized or anodized (dull) instruments decrease risk of injury. Reflective drapes are less flammable (Ball).
- 85. (C)** Universal precautions should be used when one is exposed to surgical smoke in order to reduce occupational exposure through the skin, eye, and mucous membrane (Ball).
- 86. (C)** The slit lamp is a stereoscopic biomicroscope that magnifies in three dimensions. It is used for the delivery of the laser beam especially in the treatment of glaucoma (Fortunato; Meeker and Rothrock).
- 87. (D)** Ruby lasers are primarily used to eradicate port-wine stain lesions of the skin (Fortunato).
- 88. (B)** Eye protection with lenses that filter specific wavelengths is needed. Argon and YAG lasers will be absorbed by the retina and the CO₂ laser by the cornea. Argon requires an amber-tinted lens filter, CO₂ requires clear glass or plastic with side shields, and YAG requires a green-tinted lens filter (Fortunato; Ball).

- 89. (D)** Special high filtration masks should be worn (double masking is inadequate). A smoke evacuator or suction is also effective (Fortunato; Ball).
- 90. (B)** A PVC can easily be ignited by a laser beam and support combustion. The others are less likely to ignite (Fortunato; Ball).
- 91. (A)** The scrub person should have a basin of sterile water or saline on the instrument table when laser is in use in the event of fire (Fortunato).
- 92. (D)** The unit is placed in the standby mode when not actually in use to prevent accidental and uncontrolled laser firing (Ball; Meeker and Rothrock).
- 93. (C)** The blue–green argon is used for retinal detachment, tear, or hole (Fortunato).
- 94. (B)** The Candela laser is a tunable pulse-dyed system that has the ability to disintegrate stones without damaging soft tissue. Gas lasers are CO₂ or Argon, a solid is Nd:YAG; or a semiconductor crystal is a dioxide (Meeker and Rothrock).
- 95. (D)** The medical antishock trouser (MAST) is a

garment designed to correct and counteract internal bleeding conditions and hypovolemia. It creates an encircling pressure around both legs and abdomen. It slows or stops arterial bleeding, forces any available blood from the lower body to the heart, brain, and other vital organs, and it prevents the return of available circulating blood volume to the lower extremities (Fortunato).

- 96. (C)** A Levin tube is a 16 Fr, plastic catheter used in gastric intubation that has a closed weighted tip and an opening on the side (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 97. (A)** Cottonoid patties are compressed rayon or cotton sponges that are used moist on delicate structures such as nerves, brain, and spinal cord (Fortunato).
- 98. (B)** A moustache dressing may be applied under the nose (nares) to absorb any bleeding (Meeker and Rothrock).
- 99. (D)** Stockinette is a knitted, seamless tubing of cotton 1 to 12 inches wide. It stretches to fit any contour snugly (Fortunato).

- 00. (A)** In a laminectomy, cottonoid strips or patties are placed in the extremes of the field for hemostasis (Meeker and Rothrock).
- 01. (A)** Webril is a soft, lint-free cotton bandage. The surface is smooth but not glazed, so that each layer clings to the preceding one and the padding lies smoothly in place (Fortunato).
- 02. (A)** Petroleum gauze packing is inserted into the anal canal following hemorrhoidectomy (Fortunato).
- 03. (C)** This bandage is preferable for holding dressings in place over mobile areas such as the neck or extremities, or where pressure is required (Fortunato).
- 04. (A)** Kitner dissecting sponges are small rolls of heavy cotton tape that are held in forceps (Fortunato).
- 05. (D)** Peanut sponges are very small gauze sponges used to dissect or absorb fluid in delicate procedures (Fortunato).
- 06. (A)** Pigskin (porcine) is used as a temporary biologic dressing to cover large body surfaces denuded of skin (Fortunato).

- 07. (D)** Pressure dressings are used frequently following extensive operations, especially in plastic surgery, knee operations, and radical mastectomies (Fortunato).
- 08. (B)** Tonsil sponges are cotton-filled gauze with a cotton thread attached (Fortunato).
- 09. (B)** Patties are moistened with saline and pressed out flat on a metal surface. They could pick up lint if placed on a towel (Fortunato).
- 10. (D)** Steri strips may be used instead of or supplementary to closure if very close approximation of skin is required for good cosmetic results (Fortunato).
- 11. (A)** Tincture of benzoin is a protective coating substance frequently applied to the skin before adhesive dressings are used (Fortunato).
- 12. (D)** A stent dressing or fixation is a method of applying pressure and stabilizing tissues when it is impossible to dress an area. In the case of the nose, for example, long suture ends are crisscrossed over a small dressing and tied (Fortunato).

- 13. (A)** Instruments and catheters are measured on a Fr scale; the diameter (in millimeters) is multiplied by 3. The smallest is 1 mm in diameter times 3, or 3 French (Fortunato).
- 14. (A)** Drains may be inserted directly from the incision or through a separate small incision, known as a stab wound, close to the operative site (Meeker and Rothrock).
- 15. (A)** A myringotomy is the incision of the tympanic membrane to treat acute otitis media. Frequently tubes are inserted into the tympanic membrane to allow ventilation of the middle ear. Once the tube falls out, the tympanic membrane incision usually heals (Meeker and Rothrock).
- 16. (C)** Chest tubes (28–30 Fr) are used to effect chest drainage via the pleural opening (Meeker and Rothrock).
- 17. (C)** A Fogarty-type biliary catheter is a balloon-tipped catheter used to facilitate the removal of small stones and debris in the duct of the gallbladder. It also demonstrates patency of the common bile duct to the duodenum (Meeker and Rothrock).

- 18. (A)** Mushroom, Malecot, or Foley catheters are frequently used in the anterior gastric wall and are held in place by a purse-string suture (Meeker and Rothrock).
- 19. (D)** A Pezzar or mushroom catheter is for drainage of body cavities. The others are commonly used ureteral catheter tips (Meeker and Rothrock).
- 20. (B)** A hemovac is a closed-wound suction system that creates negative pressure in a reservoir attached to the drain (fluid collects here) (Meeker and Rothrock).
- 21. (D)** Ureteral catheters are made of flexible woven nylon or other plastic materials, range in size from 3 to 14 Fr, and have graduated markings in centimeters (Fortunato).
- 22. (C)** Ureteral stent is an indwelling stent. It is inserted for long-term or temporary drainage for ureteral obstruction (Fortunato).
- 23. (D)** The preferred site of placement is the external jugular vein. Its insertion is indicated for infants and children who require TPN (total parenteral nutrition) because feeding through the GI tract is impossible,

inadequate, or hazardous (Meeker and Rothrock).

- 24. (C)** Hegar dilators are cervical dilators. The others are all used for urethral dilatation (Meeker and Rothrock).
- 25. (B)** This portable system is used to apply suction to a large closed-wound site postoperatively. A constant, negative vacuum evacuates tissue fluid and blood to promote healing by reducing edema and media for microbial growth (Meeker and Rothrock).
- 26. (A)** Pressure from a 30-cc catheter balloon inserted after closure of the urethra helps obtain hemostasis by controlling venous bleeding (Meeker and Rothrock).
- 27. (B)** Suction tubing with a Lukens tube collects washing specimens during a bronchoscopy (Meeker and Rothrock).
- 28. (A)** A Gruntzig balloon dilation catheter is used for balloon angioplasty to dilate occluded vessels (Fortunato).
- 29. (D)** A Pezzar or mushroom is a self-retaining catheter and is straight or angulated with a large single channel with the tip in the shape of a mushroom. This catheter

is used primarily to drain the bladder suprapubically (Meeker and Rothrock).

30. (C) The third lumen provides a means for continuous irrigation of the bladder for a time postoperatively to prevent formation of clots in the bladder (Meeker and Rothrock).

31. (C) The image intensifier converts the X-ray beam through the body into a fluoroscopic optic image projected onto a television screen (Fortunato).

32. (A) Extracorporeal refers to the outside of the body. Many cardiac surgical procedures are done while the patient is placed on partial or complete cardiopulmonary bypass (CPB) (extracorporeal circulation). A pump removes blood from the systemic circulation, filters it, passes it through an oxygenator, and returns it to the patient via a cannula in the ascending aorta or the femoral artery. The oxygenated blood is used by the organs and tissues of the body and then returned to the pump or heart–lung machine, where the process is once again repeated (Mosby’s Medical, Nursing, and Allied Health Dictionary, 5th ed.).

- 33. (C)** The Apgar score is a system that scores an infant's physical condition 1 minute after birth. The heart rate, respiration, muscle tone, color, and stimuli response are scored. The maximum total score for a normal baby is 10. Those with low scores require immediate attention if they are to survive (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 34. (D)** An electroencephalogram (EEG) records electrical activity of the brain via electrodes applied to the scalp (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 35. (C)** A roentgenogram is a photographic image produced as X-rays pass through the body and expose the X-ray film (Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 36. (B)** An abduction pillow is placed between the patient's legs postoperatively to aid in immobilization of the hip joints after surgery (Meeker and Rothrock).
- 37. (D)** Disposable chest drainage collects drainage, maintains a water seal, and provides suction control. It is aimed at providing a conduit for air, blood, and other fluids as well as the reestablishment of negative

pressure in the intrapleural space (Meeker and Rothrock).

- 38. (D)** Drainage systems consist of drainage collection, water seal, and suction. Air, blood, and other fluid from the interpleural space are drained to reestablish negative pressure in the interpleural space that has resulted from a collapsed lung (Meeker and Rothrock).
- 39. (A)** A Minerva jacket is applied from the hips to the head. If the head is to be completely immobilized, it is included in the jacket. It is used for fractures of the cervical or upper thoracic vertebra (Fortunato).
- 40. (D)** Inflatable, double-walled vinyl boots use alternating compression and relaxation to reduce risk of deep-vein clotting in legs of high-risk patients undergoing general anesthesia (Fortunato).
- 41. (A)** Prolene mesh is inert. It can be used in the presence of infection. Mersilene and Gore-tex cannot (Fortunato).
- 42. (B)** Mersilene mesh comes in sterile sheets. Unused, but *not* soiled or blood stained, mesh may be steam sterilized only *once*. It is important that it to be

marked so it is not reused more than once (Fortunato).

- 43. (C)** Autogenous bone, from the patient is taken from the ilium, tibia, or rib cage (Fortunato).
- 44. (D)** The patient may come to the OR with this in place to control bleeding by pressure from the inflated balloon in the tube (Fortunato).
- 45. (B)** A temporary or permanent opening in the stomach for decompression or alimentation is accomplished with either a Foley, Mallecot, Pezzer, or Mushroom catheter (Fortunato).
- 46. (D)** Complications such as hemorrhage, infection, cervical stenosis, incompetent cervix, and infertility are minimized by obtaining the biopsy with a carbon dioxide laser cutting beam (Fortunato).
- 47. (C)** Stereotaxis is the accurate location of a definite area within the brain from external points or landmarks on the skull via the computer. The stereotactic surgery can be performed through a burr hole, endoscope, or open craniotomy. Various intracranial procedures are performed with computer-assisted stereotaxis (Fortunato).

- 48. (A)** The Doppler is a blood flow detector. Ultrasonic imaging records flowing blood (Fortunato).
- 49. (D)** A secondary monitor is called a “slave” (Meeker and Rothrock).
- 50. (A)** The Hickman catheter is used for long-term intermittent chemo or antibiotic infusion. It is introduced via the jugular, cephalic, or subclavian vein into the superior vena cava or the right atrium (Fortunato).
- 51. (A)** Any patient who cannot be nutritionally maintained by other means is a candidate for total parenteral hyperalimentation nutrients provided via long-term indwelling catheter (Fortunato).
- 52. (D)** An Ambu, or breathing bag, controls flow of respiratory gases entering the lungs (Mosby’s Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 53. (C)** A blood warmer is used to maintain 89°F–105°F temperature. Cold blood may induce hypothermia, whereas blood too warm may cause hemolysis (Fortunato).

- 54. (B)** A blood filter is used for all transfusions to filter out microaggregates (Fortunato).
- 55. (A)** A hyperthermia blanket is warmed and maintained at 95°F–100°F and is double thickness covered. The other statements are all true (Fortunato).
- 56. (B)** Choledochoscopy is direct visualization of the common bile duct requiring distention of the common bile duct (CBD) for better visualization. This is done by irrigating the ducts with saline via a pressure bag (300 Hg) around an IV (saline) bag. Sterile tubing is passed off-field and attached to saline. Scrub nurses attach the distal end of IV tubing to irrigating stopcock on choledochoscope (Meeker and Rothrock).
- 57. (C)** A laminaria tent is a cone composed of dried seaweed that swells as it absorbs water and, therefore, is used to dilate the cervix nontraumatically in preparation for induced abortion (Meeker and Rothrock; Mosby's Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 58. (B)** A radiant warmer provides immediate postdelivery care of the infant delivered by C-section. These infants are at risk until there is evidence of physiologic

stability (Meeker and Rothrock).

59. (A) In fluoroscopy, a fluorescent light reproduces optical images of body structures identified by X-rays onto a luminescent screen. These images can be amplified with an image intensifier and can be projected onto a TV monitor (Fortunato).

60. (D) Radiation exposure can be as much as 10 times greater during 1 minute of fluoroscopy than of a single X-ray (Meeker and Rothrock).

61. (A) A patient-controlled analgesia (PCA) is a pain management device which administers a predetermined intravenous dose of narcotic substitute for pain relief. It allows a continuous and bolus administration when the patient believes it is necessary (Meeker and Rothrock).

62. (B) A Penrose drain creates a passage from tissue inside the wound to outside. It is used when drainage is minimal (Saunders).

63. (B) A T-tube is a gravity drain and is used on wounds that produce significant drainage but does not require suction for removal (Saunders).

- 64. (D)** Suction drains are used in areas that produce large amounts of fluid. Air is evacuated from the container by squeezing it to activate the negative pressure and wound tubing is attached (Saunders).
- 65. (A)** A suction drainage system would commonly be used on a total hip arthroplasty (Saunders).
- 66. (B)** Surgery or trauma to the thorax causes the lungs to collapse due to loss of negative pressure. Water seal drainage restores negative pressure back to the thoracic cavity (Saunders).
- 67. (A)** Keeping the collection unit below the chest tube prevents re-entry of fluids into the drainage space and provides negative pressure (Saunders).

CHAPTER 17

Counts and Specimens

Questions

1. When are counts done in the OR?

- (A) At beginning and end of case
- (B) Before beginning of case, at beginning of wound closure, and at skin closure
- (C) As case begins and when case is in progress
- (D) Before beginning of case and at end of case

2. Soiled sponges are

- (A) never touched with bare hands
- (B) left in the kick bucket until the count begins
- (C) removed from the room once the peritoneum is closed
- (D) counted and stacked on a towel or sheet on the OR floor

3. The initial count requires

- (A) a count of both plain and radiopaque sponges
- (B) that counts be done in the right-hand corner on the back table

(C) that the count be done aloud by circulator and scrub

(D) the scrub to count each item and report to the circulator for recording

4. If a sponge pack contains an incorrect number of sponges, the circulating nurse should

(A) isolate the pack, do not use it

(B) document it on the count record

(C) use it after adding or subtracting the correct number

(D) return it to the original outer package and set it aside

5. In an instrument count

(A) all instruments and parts must be counted

(B) precounted sets eliminate the need for precase count

(C) large bulky instruments need not be counted

(D) count only instruments that will be used

6. Which of the following statements concerning sponges are true EXCEPT

(A) only radiopaque sponges should be used on the sterile field

- (B) sponges should be counted from the folded edge
- (C) a pack containing an incorrect number of sponges is discarded
- (D) a count is unnecessary in a vaginal procedure

7. The following statements regarding counts are true EXCEPT

- (A) the relief scrub or circulator does not need to repeat count if only one of them is relieved
- (B) all counts are verified before person being relieved leaves room
- (C) persons taking final count are held accountable
- (D) persons taking final count must sign the count record

8. During the closure count a discrepancy

- (A) is noted on patient's chart
- (B) is reported to surgeon
- (C) is reported to supervisor
- (D) is reported to anesthesiologist

9. If a sponge is intentionally left in the patient

- (A) a report is made to the supervisor
- (B) an incident report is completed
- (C) a notation is placed on the operative record

(D) None of the above

10. The following statements regarding counting sponges are true EXCEPT

(A) sponges are counted at folded edge

(B) shake pack to separate sponges

(C) separate each sponge and number aloud while placing it in a pile on table

(D) an incorrect number of sponges in a pack should be compensated for on count sheet with a notation

11. During the sponge count procedures, which action would constitute an UNACCEPTABLE technique?

(A) Soiled sponges are separated, stacked, and counted in multiples

(B) Soiled sponges used for prep remain in kick bucket and are not part of count

(C) Sponges are not added or removed from operative field during count

(D) Sponges are counted before being moistened or used

12. Instruments added to the sterile field after the case is in progress are counted by

(A) STSR and circulator

- (B) STSR and first assist
- (C) Does not need to be counted
- (D) Included in final count

13. Counted items include

- (A) sponges
- (B) umbilical tapes
- (C) suture reels
- (D) All of the above

14. The closing counts are done in what order?

- (1) Mayo stand
 - (2) Back table
 - (3) Sterile field
 - (4) Items discarded from the sterile field
- (A) 1, 2, 3, 4
 - (B) 3, 2, 1, 4
 - (C) 3, 1, 2, 4
 - (D) 2, 3, 1, 4

15. If the count is incorrect the proper order or procedural steps are: 1. Radiograph is taken 2. Search is initiated 3. Notify surgeon and count repeated

- (A) 3, 2, 1
- (B) 1, 2, 3
- (C) 2, 3, 1

(D) 1, 3, 2

16. When performing a C-section, the first count is initiated

- (A) before closing the body cavity
- (B) before closing the uterus
- (C) before the closing suture is given
- (D) when the shift change occurs

17. The first closing count is performed on which abdominal layer?

- (A) Skin
- (B) Sub q
- (C) When the surgeon requests
- (D) Peritoneum

18. Who is directly responsible for receiving and handling the specimen on the sterile field?

- (A) STSR
- (B) Circulator
- (C) Anesthesiologist
- (D) Surgeon

19. Damage to or loss of specimens results in

- (A) an incorrect diagnosis
- (B) repeat or needless surgery
- (C) delayed treatment
- (D) All of the above

20. What type of biopsy is performed during a flexible endoscopic procedure?

- (A) Incisional biopsy
- (B) Needle biopsy
- (C) Brush biopsy
- (D) Fine needle aspiration

21. Stones are sent to pathology in

- (A) formalin
- (B) dry container
- (C) sterile saline
- (D) not sent to pathology

22. Which of the following is considered a foreign body?

- (A) A nontissue item
- (B) Wood
- (C) An implant
- (D) All of the above

23. An amputated limb is sent

- (A) to the morgue
- (B) pathology
- (C) in formalin
- (D) it is discarded

24. What type of specimen requires immediate analysis?

- (A) Stones
- (B) Foreign body
- (C) Frozen section
- (D) All of the above

25. Bacteria cultures obtained during surgery are

- (A) ABGs
- (B) aerobic
- (C) anaerobic
- (D) Both B and C

Answers and Explanations

- 1. (B)** The first count is done by the instrument wrapper at assembly. The second count is done immediately before the operation begins by the scrub and the circulator. A third count is done when wound closure is started. A fourth is done for any discrepancy and at skin closure. An additional count may be done when a cavity within a cavity is closed, for example, uterus (Fortunato).
- 2. (A)** Soiled sponges should never be touched with bare hands. Sponges should be counted in units and bagged in a waterproof plastic bag or transferred to a moisture-proof surface until the final count is completed. This is done to avoid hepatitis or pathogenic organism transmission (Fortunato).
- 3. (C)** The scrub nurse and the circulator count each item aloud and together. The nurse then records the number. Count additional items away from already counted items. Counting should be uninterrupted (Fortunato).
- 4. (A)** If a pack contains an incorrect number of sponges,

it is the responsibility of the circulator to isolate it, and it is not used. The danger of error is great if attempts are made to correct or compensate for discrepancies (Fortunato).

- 5. (A)** Each item used must be considered a foreign object that can cause unnecessary harm should it be left inside the patient. Detachable parts of instruments must be counted. This ensures that part of an instrument does not remain in the wound (Fortunato).
- 6. (D)** Sponge and instrument counts are very important in vaginal procedures. Sponges should be secured on sticks in deep areas. This prevents loss in hard-to-see areas (Fortunato).
- 7. (A)** The relief of either the scrub or the circulator by another person necessitates the verification of all counts before person being relieved leaves room. Persons taking final counts are held accountable and must sign record (Fortunato).
- 8. (B)** During the closure count, the scrub person reports counts as correct or incorrect to the surgeon (Fortunato).
- 9. (C)** If a sponge is intentionally retained for packing of an instrument remains with patient, this should be

noted on operative record (Fortunato).

- 10. (D)** If a pack contains an incorrect number of sponges, scrub hands pack to circulator. Attempts should not be made to correct errors or compensate for discrepancies. Pack is isolated and not used (Fortunato).
- 11. (B)** Prep sponges are bagged in plastic and stored in the room. Never place in the kick bucket or trash receptacle until after completion of final count (Fortunato).
- 12. (A)** Recommended procedure for counts including sponges, sharps, instruments, and special equipment which requires at least a licensed registered nurse and an STSR (Fuller).
- 13. (D)** Counted items include sponges, sharps, instruments, retraction devices (umbilical tapes, vessel loops, bolsters, sutures, reels), and any other small item that is used on the sterile field (Fuller).
- 14. (C)** The closing count begins with the sterile field then to the Mayo stand, back table, and, finally, to items that were discarded from the field (Fuller).

- 15. (A)** When the count is incorrect, the surgeon is notified and the count is repeated. A search is initiated and finally, an X-ray is taken (Fuller).
- 16. (B)** The first count performed during a C-section is done before closing the uterus which is a hollow organ (Fuller).
- 17. (D)** The first closing count is performed when the peritoneum is being closed (Fuller).
- 18. (A)** The STSR is directly responsible for receiving the specimen on the sterile field (Fuller).
- 19. (D)** If a specimen is lost or damaged, the result can be an incorrect diagnosis, repeat or needless surgery, and delayed treatment (Fuller).
- 20. (C)** A brush biopsy is performed during a flexible endoscopic procedure. A fine brush is used to collect cells on the surface of mucous membranes (Fuller).
- 21. (B)** Stones removed from the urinary tract, salivary ducts, and the gallbladder are sent in a dry container to pathology (Fuller).

- 22. (D)** A nontissue item, wood, or an implant are all considered foreign bodies (Fuller).
- 23. (B)** Initially, the limb must be sent for analysis to pathology like any specimen and then sent to the morgue (Fuller).
- 24. (C)** Frozen section requires immediate analysis. This is accomplished by freezing the tissue and making fine sectional slices that can be examined microscopically (Fuller).
- 25. (D)** The two types of bacteria cultures taken intraoperatively are aerobic and anaerobic (Fuller).

CHAPTER 18

Sutures and Drains

Questions

- 1.** Which of the following is a monofilament suture?

 - (A) Prolene
 - (B) Silk
 - (C) Polyester
 - (D) Vicryl
- 2.** The size of the suture is based on its diameter. An example of a suture with the same diameter is a 2-0 silk and

 - (A) 3-0 silk
 - (B) 2-0 nylon
 - (C) 4-0 silk
 - (D) Both A and C
- 3.** Which term refers to the amount of force needed to break the suture?

 - (A) Multifilament
 - (B) An absorbable quality
 - (C) Tensile

(D) Nonabsorbable

4. Which needle would be used on a liver resection?

- (A) Cutting
- (B) Tapered
- (C) Keith
- (D) Blunt

5. Which suture needle is contraindicated for a repair of nerve tissue?

- (A) Taper
- (B) Cutting
- (C) Reverse cutting
- (D) Both B and C

6. When using a skin gun, the staples go through which two layers?

- (A) The epidermis and the dermis
- (B) Cuticular and subcuticular
- (C) Subcuticular and muscle
- (D) Cuticular and muscle

7. In an appendectomy, a purse string suture is used to

- (A) tie off the appendix

- (B) invert the stump of the appendix
- (C) use to retract the appendiceal stump
- (D) All of the above

8. A cutting needle would not be used on

- (A) the skin
- (B) the bowel
- (C) the tendon sheath
- (D) the eye

9. If the surgical technician in the scrub role receives a broken needle back from the surgeon, they should

- (A) order an X-ray
- (B) report it to the circulator
- (C) remember to add to the final count
- (D) tell the surgeon immediately

10. All of the following are absorbable sutures EXCEPT

- (A) polyglactin 910
- (B) chromic
- (C) nylon
- (D) plain gut

11. What suture would be used on a coronary artery bypass and an aortic valve replacement?

- (A) Polypropylene
- (B) Silk
- (C) Dexon
- (D) Vicryl

12. Chromic and plain gut suture originate from

- (A) sheep intestine
- (B) beef intestine
- (C) pig intestine
- (D) Both A and B

13. Which of the following sutures would commonly cause the least tissue reaction?

- (A) Chromic
- (B) Silk
- (C) Stainless steel
- (D) Vicryl

14. What term is used for a suture thread preattached to a needle?

- (A) Swagged
- (B) Tensile strength
- (C) French eye
- (D) Continuous

15. Retention sutures with bolsters would be used in what type of incision?

- (A) Pfannenstiel
- (B) Abdominal midline
- (C) Oblique
- (D) Transverse

16. What type of suture technique is used for a cosmetic closure?

- (A) Purse string
- (B) Detach
- (C) Retention
- (D) Sub cuticular

17. A Keith needle is

- (A) straight needle with a tapered point
- (B) straight needle with a cutting point
- (C) another name for a spatula needle
- (D) extremely large curved needle

18. A name given to a suture ligature that is passed through a vessel or a duct for ligation is

- (A) tie on a passer
- (B) stick tie

- (C) swagged needle
- (D) ligareel

19. A strand of suture material attached to the top of an adson clamp or a right angle is

- (A) stick tie
- (B) Keith
- (C) tie on a passer
- (D) ligareel

Answers and Explanations

- 1. (A)** Prolene is a single continuous fiber made of a polymer chemical (ie, chains of the same molecule strung together) that is extruded and stretched (Fuller).
- 2. (B)** A 2-0 silk has the same diameter as a 2-0 nylon suture. A numbering system indicates the sutures outside diameter and ensures that a stated size is the same regardless of the material (Fuller).
- 3. (C)** Tensile strength refers to the amount of force needed to break the suture (Fuller).
- 4. (D)** A blunt needle is the least traumatic and the safest needle point. It is used on friable tissue and organs that are soft and spongy (Fuller).
- 5. (D)** The taper needle has a round body that tapers to a sharp point. Its primary use is for suturing soft tissue such as the biliary track, the dura, Gastrointestinal (GI), muscle and nerve (Fuller).
- 6. (B)** When using a skin gun, the cuticular and subcuticular are penetrated (Fuller).

- 7. (B)** A purse string suture is used to invert the stump of the appendix into the cecum (Fuller).
- 8. (B)** A cutting needle is not used on the bowel because it lacerates the bowel (Fuller).
- 9. (D)** When the STSR receives a broken needle back from the surgeon they should immediately tell him (Fuller).
- 10. (C)** All are absorbable except nylon which is a nonabsorbable suture (Fuller).
- 11. (A)** The polypropylene is commonly used on soft tissue and cardiovascular surgery (Fuller).
- 12. (D)** Chromic and plain gut is protein collagen derived from the submucosal layer of sheep or beef intestine (Fuller).
- 13. (C)** Surgical stainless steel is the strongest of suture materials. It has no significant inflammatory properties. It is available in monofilament, twisted and commonly used in the presence of infection (Fuller).
- 14. (A)** The suture is inserted into the eye end of the

needle and is crimped and sealed. This is referred to as swagged on (Fuller).

- 15. (B)** Retention sutures provide additional support to wound edges in abdominal surgery (Fuller).
- 16. (D)** In subcuticular stitching, the needle is placed within the dermis from side to side. This technique brings the skin edges together and no suture material is visible from the outside. This technique produces a very fine scar or no scar (Fuller).
- 17. (B)** A Keith needle is a straight needle with a cutting point frequently used in GYN and used on superficial tissue (Fuller).
- 18. (B)** A suture ligature is passed through a vessel or a duct for ligation and is commonly used in deeper cavities (Fuller).
- 19. (C)** A tie on a passer is a strand of suture material attached to the top of an adson or right angle clamp (Fuller).

CHAPTER 19

Wound Healing and Dressings

Questions

1. A surgical wound that is sutured together heals by

- (A) granulation
- (B) primary intention
- (C) inflammatory means
- (D) second intention

2. Which classification of wound healing is involved with perforated bowel?

- (A) Secondary intention
- (B) Primary intention
- (C) Third intention
- (D) Fourth intention

3. Which wound is assigned to tissue healing by granulation?

- (A) Secondary intention
- (B) Third intention
- (C) Fourth intention
- (D) Inflammatory intention

4. Which type of wound healing requires debridement and continuous irrigation?

- (A) Primary
- (B) Secondary
- (C) Third
- (D) Fourth

5. What will be the correct order of wound healing process: (1) remodeling, (2) proliferation, and (3) inflammatory?

- (A) 1, 2, 3
- (B) 2, 3, 1
- (C) 3, 2, 1
- (D) 2, 1, 3

6. Which of the following is associated with secondary intention wound healing?

- (A) Wound that is sutured together
- (B) Infected contaminated wound
- (C) Wound space that is packed
- (D) Wound that is not sutured

7. During which phase of healing is a scab formed?

- (A) Inflammatory

- (B) Proliferation
- (C) Remodeling
- (D) Primary

8. Conditions that affect wound healing include

- (A) surgical technique
- (B) obesity
- (C) age
- (D) All of the above

9. A sunburn is classified as a

- (A) second degree burn
- (B) first degree burn
- (C) third degree burn
- (D) Not classified

10. Which of the following burns cause destruction of the entire thickness of skin?

- (A) First degree
- (B) Second degree
- (C) Third degree
- (D) Fourth degree

11. Which burn classification is characterized by dry white skin and generally have little pain associated

with this burn?

- (A) First degree
- (B) Second degree
- (C) Third degree
- (D) Fourth degree

12. Another name for a scar is

- (A) fibrin
- (B) keloid
- (C) hydrocolloid
- (D) infection

13. Which nonadherent surgical dressing is used for a clean surgical wound and also care of specimens?

- (A) Sterile gauze
- (B) Telfa
- (C) ABD
- (D) Xeroform

14. What type of dressing is most often used on a skin graft?

- (A) Pressure
- (B) Stent
- (C) Flat

(D) Both A and B

15. What type of pressure dressing is molded into a thick pad that fits into the graft area and is secure with sutures?

(A) Supportive

(B) Stent

(C) Flat

(D) Tegaderm

16. Gauze packing is used

(A) on a small incision

(B) wrapping a limb

(C) in nose or open wound

(D) when compression is needed

17. A strong thin transparent liquid useful in sealing certain wound edges is

(A) dermabond

(B) tincture of benzoin

(C) collodian

(D) Both A and C

18. The main purpose of Webril is

- (A) cast padding
- (B) under pneumatic tourniquet
- (C) pressure dressing
- (D) Both A and B

19. What type of gauze dressing is used on a circumcision?

- (A) Sponge
- (B) Tegaderm
- (C) Vaseline gauze
- (D) Roll gauze

20. What is the correct order of dressing a surgical wound: (1) place dressings, (2) wash the incision, (3) cover sterile dressing with a towel, and (4) remove drapes?

- (A) 1, 2, 3, 4
- (B) 2, 1, 3, 4
- (C) 3, 4, 1, 2
- (D) 3, 4, 2, 1

21. A circumferential bandage should be applied to an extremity

- (A) distal to proximal
- (B) proximal to distal
- (C) anterior to lateral

(D) medial to anterior

Answers and Explanations

- 1. (B)** In a primary intention wound, the cut tissue edges are in direct contact. This is an aseptic wound with minimum tissue damage and reaction (Fuller).
- 2. (C)** Third intention or a delayed closure is a process in which an infected or a contaminated wound is treated. An example is perforated bowel (Fuller).
- 3. (A)** This type of wound heals from the base. The healing process involves filling the tissue gap with granulation tissue (Fuller).
- 4. (C)** A delayed closure may be performed when the wound is infected or requires continuous irrigation and debridement (Fuller).
- 5. (C)** The phases of wound healing are inflammatory, proliferation, and remodeling (Fuller).
- 6. (D)** A wound that is not sutured must heal by secondary intention (Fuller).
- 7. (A)** During the inflammatory phase, platelet aggregation and the formation of a scab are followed

by the cellular phase (Fuller).

- 8. (D)** All of the above including the immune system, chronic disease, and nutrition are all factors in wound healing (Fuller).
- 9. (B)** Burns are classified by the depth of the burn. First degree burns involve only the outer layer of the epidermis, for example, sunburn (Fuller).
- 10. (C)** Burns that cause the destruction of the entire thickness of skin is a third degree burn (Fuller).
- 11. (C)** Third degree burns are characterized by dry white skin and generally have little pain (Fuller).
- 12. (B)** When the proliferation of collagen is excessive, the scar is a keloid (Fuller).
- 13. (B)** A telfa is a nonadherent flat fabric pad used for clean surgical wounds and also used in surgery for the care of specimen (Fuller).
- 14. (D)** A stent dressing is a type of pressure dressing. They are used to apply slight pressure on the graft site. This prevents serous fluid from lifting the skin

graft away from the recipient site (Fuller).

- 15. (B)** A stent dressing is molded into a thick pad that fits into the graft area. Sutures are placed around the graft site. The long suture ends are tied over the pad to secure it in place (Fuller).
- 16. (C)** Gauze packing is used in a cavity such as the nose or an open wound. It is available in long thin strips and packaged in a bottle or a similar container (Fuller).
- 17. (D)** Dermabond and collodian are liquid self-adhesives and occlusive dressings (Fuller).
- 18. (D)** Webril is a soft felt padding used under a pneumatic tourniquet and cast padding (Fuller).
- 19. (C)** Vaseline gauze is used to cover delicate incisions where tearing of tissue would disrupt repair. Examples are minor burns, skin grafts, and circumcisions (Fuller).
- 20. (B)** The correct order of dressing the surgical wound is wash the incision, place dressings, cover sterile dressing with a towel, and remove drapes (Fuller).

21. (A) The bandage should be applied from distal to proximal as this prevents blood from pooling at the surgical site (Fuller).

SECTION V
Intraoperative and Postoperative
Procedures

CHAPTER 20

General Surgery

Questions

- 1.** In a gastrointestinal closure, the mucosa of the intestinal tract is closed with

 - (A) chromic 4–0 or 3–0
 - (B) silk 4–0 or 3–0
 - (C) Dacron 3–0 or 2–0
 - (D) Novafil 3–0 or 2–0
- 2.** Which type of suture would be used to invert the stump of an appendix?

 - (A) Buried
 - (B) Purse-string
 - (C) Mattress
 - (D) Tension
- 3.** Why are bumpers or bolsters used on retention sutures?

 - (A) To prevent the suture from cutting into the skin surface
 - (B) To facilitate easy removal

- (C) To identify the order of suture removal
- (D) To prevent unequal tension on the wound edges

4. A Nissen Fundoplication procedure is done to correct

- (A) repeated attacks of volvulus
- (B) antireflux disease
- (C) bladder prolapse
- (D) gastroesophageal stenosis

5. A dissecting sponge that is a small roll of heavy cotton tape is a

- (A) Kitner
- (B) peanut
- (C) tonsil
- (D) tape

6. Which procedure would not require a pressure dressing?

- (A) Plastic surgery
- (B) Knee surgery
- (C) Radical mastectomy
- (D) Hysterectomy

7. Peanuts and dissecting sponges are generally

- (A) used dry
- (B) moistened with saline
- (C) moistened with water
- (D) moistened with antibiotic solution

8. Intraabdominally, lap pads are most often used

- (A) dry
- (B) moistened with saline
- (C) moistened with water
- (D) moistened with glycine solution

9. Specimens may be passed off the sterile OR table by the scrub person on all of the following items EXCEPT

- (A) sponge
- (B) towel
- (C) basin
- (D) paper

10. A catheter commonly used in a gastrostomy is a

- (A) mushroom
- (B) Rehfus
- (C) Cantor
- (D) Sengstaken–Blakemore

11. Before handing a Penrose drain to the surgeon

- (A) place it on an Allis clamp
- (B) attach a safety pin to it
- (C) cut it to the desired length
- (D) moisten it in saline

12. A closed-wound suction system works by

- (A) positive pressure
- (B) negative-pressure vacuum
- (C) air displacement
- (D) constant gravity drainage

13. Which condition regarding sterile technique is NOT recommended?

- (A) Sterile tables are set up just before the operation
- (B) Sterile tables may be set up and safely covered until time of surgery
- (C) Once sterile packs are open, someone must remain in the room to maintain vigilance
- (D) Sterile persons pass each other back to back

14. Which of the following conditions is not an acceptable aseptic technique?

- (A) Scrub nurse standing on a platform or standing

stool

- (B) Scrub nurse keeps hands below shoulder level
- (C) Scrub nurse folds arms with hands at axillae
- (D) Scrub nurse's hands are at or above waist level

15. The disposable circular staple designed to hold two tubular structures together after resection is known as

- (A) TA linear
- (B) LDS
- (C) EEA
- (D) GIA

16. When a sterile item is hanging or extending over the sterile table edge, the scrub nurse

- (A) must watch closely that no one comes near it
- (B) does not touch the part hanging below table level
- (C) should pull it back onto the table so it does not become contaminated
- (D) may use the item

17. Which of the following is considered a break in technique?

- (A) a sterile person turns his or her back to a nonsterile person or area when passing
- (B) sterile persons face sterile areas

(C) a sterile person sits or leans against a nonsterile surface

(D) nonsterile persons avoid sterile areas

18. In which situation should sterility be questioned?

(A) If a sterilized pack is found in an unsterile workroom

(B) If the surgeon turns away from the sterile field for a brow wipe

(C) If the scrub drapes a nonsterile table, covering the edge nearest the body first

(D) If the lip of a pour bottle is held over the basin as close to the edge as possible

19. Transduodenal sphincterotomy refers to the incision made into the _____ to relieve stenosis.

(A) Cardiac sphincter

(B) Ileocecal sphincter

(C) Sphincter of Oddi

(D) Phyloric sphincter

20. When handing skin towels to the surgeon, where should the scrubperson stand in relation to the surgeon?

(A) On the opposite side of the table

- (B) On the same side of the table
- (C) At the foot of the table
- (D) Any position is acceptable

21. According to CDC guidelines, each of the following actions by a scrubperson prevents wounds and punctures EXCEPT

- (A) use an instrument to remove blades
- (B) recap injection needles
- (C) account for each needle as surgeon finishes with it
- (D) protect sharp blades, edges, and tips

22. Which of the following is NOT an acceptable technique when draping a patient?

- (A) Hold the drapes high until directly over the proper area
- (B) Protect the gloved hands by cuffing the end of the drape over them
- (C) Unfold the drapes before bringing them to the OR table
- (D) Place the drapes on a dry area

23. The procedure to follow if a hair is found on the operative field is to

- (A) notify circulator

- (B) complete an incident report
- (C) remove it with a clamp, cover over area
- (D) no action is necessary

24. In surgery, cancer technique refers to

- (A) the administration of an anticancer drug directly into the cancer site
- (B) the discarding of instruments coming in contact with tumor after each use
- (C) the use of radiation therapy at the time of surgery
- (D) the identification of the lesion

25. Why are gowns, gloves, drapes, and instruments changed following a breast biopsy and before incision for a mastectomy?

- (A) To respect individual surgeon's choice
- (B) To follow aseptic principles
- (C) To accommodate two separate incisions
- (D) To protect margins of healthy tissue from tumor cells

26. A postoperative complication attributed to glove powder entering a wound is

- (A) granulomata
- (B) infection

- (C) inflammation
- (D) keloid formation

27. The correct procedure for sterile dressing application is

- (A) apply dressing after drape removal
- (B) apply dressing before drape removal
- (C) apply raytex sponges in thick layer
- (D) apply dressing in recovery room

28. When bowel technique for an intestinal procedure is utilized

- (A) two Mayo stands are used
- (B) drapes and gloves do not need to be changed
- (C) contaminated instruments are discarded, gloves are changed
- (D) a separate setup is used for the closure

29. If the floor or wall becomes contaminated with organic debris during a case, the circulator

- (A) calls housekeeping stat
- (B) decontaminates promptly
- (C) decontaminates after case is complete
- (D) defers for terminal cleaning

30. The Sengstaken–Blakemore tube is used for

- (A) esophageal hemorrhage
- (B) tonsillar hemorrhage
- (C) uterine hemorrhage
- (D) nasal hemorrhage

31. A specially treated form of surgical gauze that has a hemostatic effect when buried in tissue is

- (A) topical thrombin
- (B) Gelfoam
- (C) human fibrin foam
- (D) Oxycel

32. An enzyme extract from bovine blood used as a topical hemostatic agent is

- (A) oxytocin
- (B) tannic acid
- (C) thrombin
- (D) collagen

33. A common complication of extubation is

- (A) hypotension
- (B) tachypnea
- (C) hypoxia

(D) hypercapnia

34. The desirable position for better visualization in the lower abdomen or pelvis is

- (A) Fowler's
- (B) reverse Trendelenburg
- (C) Trendelenburg
- (D) Kraske

35. Another name for the Kraske position is

- (A) prone on an adjustable arch
- (B) lateral
- (C) knee-chest
- (D) jackknife

36. All of the following are helpful in keeping accurate account of sponges EXCEPT

- (A) keep sponges separate from linen and instruments
- (B) keep needles separate from sponges
- (C) keep all sponges and tapes in a basin or close together on the field
- (D) keep a mental count of the number of sponges on the field at any given time

37. Dark blood in the operative field may indicate that the

patient is

- (A) hyperkalemic
- (B) hypovolemic
- (C) hypotensive
- (D) hypoxic

38. In an extreme patient emergency, a sponge count

- (A) may be omitted
- (B) may be done by the scrub alone
- (C) must be done before the case is allowed to begin
- (D) must be done before closure

39. Cultures obtained during surgery

- (A) are handled as any other specimen
- (B) are passed off the sterile field into a bag or container held by the circulator
- (C) should be kept warm or sent to the laboratory immediately
- (D) should be handled only by the scrub nurse

40. How is a frozen section sent to the laboratory?

- (A) In formalin
- (B) In saline
- (C) In water

(D) Dry

41. Which of the following specimens is NOT placed in preservative solution?

- (A) Stones
- (B) Curettings
- (C) Tonsils
- (D) Uterus

42. The term transduodenal sphincterotomy indicates surgery of the

- (A) hepatic duct
- (B) proximal end of the common bile duct
- (C) distal end of the common bile duct
- (D) pyloric sphincter

43. McBurney is an incision used for

- (A) appendectomy
- (B) cholecystectomy
- (C) herniorrhaphy
- (D) pilonidal cystectomy

44. The simplest abdominal incision offering good exposure to any part of the abdominal cavity is the

- (A) right subcostal
- (B) Kocher's
- (C) midabdominal transverse
- (D) vertical midline

45. During an appendectomy, a purse-string suture is placed around the appendix stump to

- (A) amputate the appendiceal base
- (B) retract the appendix
- (C) tie off the appendix
- (D) invert the stump of the appendix

46. Gastrointestinal technique is required in all of the following procedures EXCEPT

- (A) cholecystectomy
- (B) low anterior colon resection
- (C) appendectomy
- (D) hemicolectomy

47. A hernia occurring in Hesselback's triangle is called

- (A) indirect
- (B) spigelean
- (C) direct
- (D) femoral

48. Pathologic enlargement of the male breast is called

- (A) subcutaneous adenoma
- (B) gynecomastia
- (C) hypoplasia
- (D) cystic mastitis

49. Sutures placed in a wound to prevent wound evisceration are called

- (A) stent
- (B) fixation
- (C) retention
- (D) traction

50. Surgical enlargement of the passage between the pylorus of the stomach and the duodenum is a

- (A) pyloromyotomy
- (B) pyloroplasty
- (C) Billroth I
- (D) Billroth II

51. A Whipple operation is surgically termed a

- (A) pancreatectomy
- (B) pancreatoduodenectomy
- (C) pancreatic cyst marsupialization

(D) transduodenal sphincterotomy

52. A left subcostal incision indicates surgery of the

- (A) gallbladder
- (B) pancreas
- (C) spleen
- (D) common bile duct

53. A lower oblique incision is a/an

- (A) Pfannenstiel
- (B) inguinal
- (C) paramedian
- (D) midabdominal

54. The curved transverse incision used for pelvic surgery is

- (A) midabdominal transverse
- (B) Poupart
- (C) Pfannenstiel
- (D) McVey

55. Which breast procedure removes the entire breast and axillary contents but preserves the pectoral muscles?

- (A) Lumpectomy

- (B) Wedge resection
- (C) Modified radical mastectomy
- (D) Radical mastectomy

56. The breast procedure performed to remove extensive benign disease is a/n

- (A) axillary node dissection
- (B) simple mastectomy
- (C) radical mastectomy
- (D) modified radical mastectomy

57. What incision is indicated for an esophagogastrectomy?

- (A) Left paramedian
- (B) Upper vertical midline
- (C) Thoracoabdominal
- (D) Full midabdominal

58. In which incision could retention sutures be used?

- (A) Vertical midline
- (B) McBurney
- (C) Transverse
- (D) Thoracoabdominal

59. In which hernia is the blood supply of the trapped sac

contents compromised and in danger of necrosing?

- (A) Direct
- (B) Indirect
- (C) Strangulated
- (D) Reducible

60. In which hernia does the herniation protrude into the inguinal canal but NOT the cord?

- (A) Incisional
- (B) Femoral
- (C) Direct
- (D) Indirect

61. Which hernia leaves the abdominal cavity at the internal inguinal ring and passes with the cord structures down the inguinal canal?

- (A) Direct
- (B) Umbilical
- (C) Spigelian
- (D) Indirect

62. An abdominal wall defect may be reconstructed using

- (A) Gore-Tex patch
- (B) heavy interrupted silk

- (C) Shouldice repair
- (D) Bassini repair

63. Mersilene is a/n

- (A) wire mesh
- (B) absorbable suture
- (C) nonabsorbable suture
- (D) synthetic mesh

64. In a cholecystectomy, which structures are ligated and divided?

- (A) Cystic duct and cystic artery
- (B) Common bile duct and hepatic duct
- (C) Cystic duct and common bile duct
- (D) Hepatic duct and cystic artery

65. All of the following statements refer to pilonidal cyst surgery EXCEPT

- (A) it is performed with an elliptical incision
- (B) the wound frequently heals by granulation
- (C) probes are required on setup
- (D) the cyst is removed, but the tract remains

66. An important consideration during cholangiogram is to

- (A) irrigate with distilled water
- (B) remove all air bubbles from the cholangiocath
- (C) flash sterilize the choledocoscope
- (D) dip the catheter in lubricating jelly

67. An instrument used to elevate the thyroid lobe during surgical excision is a

- (A) Babcock
- (B) Lahey
- (C) Green
- (D) Jackson

68. The intestinal layer in order, from inside to outside, is

- (A) serosa, mucosa, musculature
- (B) mucosa, submucosa, serosa
- (C) serosa, musculature, mucosa
- (D) mucosa, serosa, musculature

69. A common postoperative patient complaint following a laparoscopic procedure is

- (A) headache
- (B) diarrhea
- (C) gastric upset
- (D) shoulder pain

70. A subphrenic abscess occurs in the

- (A) pancreas
- (B) spleen
- (C) lung
- (D) liver

71. Portal pressure measurement is indicated in

- (A) liver transplant
- (B) splenectomy
- (C) hepatic resection
- (D) Whipple operation

72. Which organ is removed either because of trauma, a blood condition, or as a staging procedure for malignancy?

- (A) Adrenals
- (B) Spleen
- (C) Liver
- (D) Pancreas

73. Following a hemorrhoidectomy,

- (A) dry dressing of 4 × 4s is packed in the rectum
- (B) petroleum gauze packing is placed in the anal canal

- (C) stent dressing is applied
- (D) steri-strip dressing is used

74. A benign anal wall “slit” type of lesion requiring excision is a/n

- (A) hemorrhoid
- (B) anal fistula
- (C) anal fissure
- (D) pilonidal sinus

75. Which gallbladder procedure ALWAYS requires intraoperative X-rays?

- (A) Choledochoscopy
- (B) Cholelithotripsy
- (C) Choledochoduodenostomy
- (D) Cholangiogram

76. In a pilonidal cystectomy, the defect frequently is too large to close and requires use of a/n

- (A) skin graft
- (B) traction suture
- (C) implant
- (D) packing and pressure dressing

77. The instrument most commonly used to grasp the

mesoappendix during an appendectomy is a

- (A) Kelly
- (B) Kocher
- (C) Babcock
- (D) Allis

78. Vaporization and coagulation of hemorrhoidal tissue can be accomplished with

- (A) cautery, bipolar
- (B) cautery, monopolar
- (C) CO₂ laser
- (D) cryosurgery

79. An entire tumor/mass removal is termed

- (A) needle biopsy
- (B) staging biopsy
- (C) excisional biopsy
- (D) incisional biopsy

80. Thrombosed vessels of the rectum are known surgically as

- (A) polyps
- (B) hemorrhoids
- (C) fistulas

(D) anorectal tumors

81. A procedure done to give the colon a rest and is then reversed is

- (A) temporary colectomy
- (B) temporary colostomy
- (C) abdominoperineal resection
- (D) McVey procedure

82. A device that may obviate the need for an abdominoperineal resection because a low anterior anastomosis can be performed is a/n

- (A) end-to-end anastomosis (EEA)
- (B) GIA
- (C) TA 55
- (D) LDS

83. An advanced inflammation of the bowel could be conservatively treated with which procedure?

- (A) Temporary colostomy
- (B) Anterior resection
- (C) Hemicolectomy
- (D) Abdominal perineal resection

84. Blunt dissection of the gallbladder from the sulcus of

the liver requires the use of a

- (A) Metzenbaum
- (B) Kelly
- (C) tampon
- (D) peanut

85. Direct visualization of the common bile duct is accomplished with a

- (A) cholangiograph
- (B) cholangiogram
- (C) choledochoscope
- (D) trocar

86. “Scratch” marking is done in surgery of the

- (A) chin
- (B) eye
- (C) breast
- (D) thyroid

87. Fogarty biliary catheters are used to

- (A) drain the gallbladder
- (B) drain the common bile duct
- (C) instill contrast media
- (D) facilitate stone removal

88. In laparoscopy, tubal patency is checked by

- (A) irrigating with normal saline
- (B) injecting renografin into the tube
- (C) injecting methylene blue into the cervical canal
- (D) irrigating tube with Lugol's solution

89. In a thyroidectomy, a loop retractor retracts the

- (A) platysma muscle
- (B) cervical fascia
- (C) thyroid veins
- (D) sternocleidomastoid muscle

90. Which structure(s) are identified and preserved in thyroid surgery?

- (A) Parathyroid glands
- (B) Hyoid bone
- (C) Thyroglossal duct
- (D) Thyroid lobe

91. Bariatric surgery treats

- (A) ulcers
- (B) obesity
- (C) thyroid disease
- (D) carcinoma of the pancreas

92. Which incision would require cutting through Scarpa's fascia?

- (A) Subcostal
- (B) Inguinal
- (C) Pfannenstiel
- (D) McBurney

93. A gastroplasty

- (A) reduces stomach size
- (B) corrects gastric junction stenosis
- (C) releases adhesions
- (D) provides avenue for hyperalimentation

94. Which item retracts the spermatic cord structure in herniorrhaphy?

- (A) Army–navy retractor
- (B) Penrose drain
- (C) Green retractor
- (D) Silk suture

95. After removal of uterus in a hysterectomy

- (A) cervical and vaginal instruments are isolated from the instrument set in a discard basin
- (B) the cervix is cauterized

- (C) new instruments are used on the cervical closure
- (D) cervical instruments are returned to the basket

96. An irreducible hernia whose abdominal contents have become trapped in the extraabdominal sac is called a/n

- (A) incarcerated hernia
- (B) sliding hernia
- (C) spigelean hernia
- (D) strangulated hernia

97. Which type of endoscopy camera produces the truest color?

- (A) One-chip
- (B) Two-chip
- (C) Three-chip
- (D) Four-chip

98. White balancing a video camera in endoscopy requires the scrub person to focus the camera on

- (A) a white sponge
- (B) a white wall
- (C) a glove wrapper
- (D) Any of the above

99. Defogging the video camera is usually the

responsibility of the

- (A) circulator
- (B) surgeon
- (C) scrub person
- (D) camera operator

00. A palliative invasive procedure done to prevent malnutrition or starvation is known as

- (A) percutaneous endoscopic gastrostomy (PEG) procedure
- (B) gastrotomy
- (C) gastrostomy
- (D) gastrojejunostomy

01. The use of noninvasive high-energy shock waves to pulverize gallstones into small fragments for easy passage through the common bile duct and out of the body is called

- (A) choledochoscopy
- (B) cholelithotripsy
- (C) choledochostomy
- (D) choledochotomy

02. Intraoperative cholangiograms can be performed either through open abdominal or laparoscopic

procedures using a contrast medium directly into the common bile duct through a

- (A) cystocath
- (B) cholangiocath
- (C) T-tube
- (D) red rubber catheter

03. Intra-abdominal pressure during the instillation of CO₂ for creation of pneumoperitoneum is 10–15 mm Hg. A pressure reading higher than this may indicate that the needle may be

- (A) buried in fatty tissue
- (B) buried in the omentum
- (C) in a lumen of intestines
- (D) all of the above

04. The proper method of removing the gallbladder specimen after complete dissection and irrigation of the operative site in a laparoscopic cholecystectomy is to

- (A) utilize an endobag
- (B) pull gallbladder through the largest port
- (C) decompress the gallbladder by suctioning bile before removal
- (D) All of the above

05. All of the following are recommendations for actions necessary to support the aseptic principle of “confine and contain” EXCEPT

(A) restrict patient contacts to an area 3 feet around the patient

(B) discard sponges into plastic-lined pails

(C) clean spills immediately with broad-spectrum disinfectant

(D) all laundry should be discarded into impervious bags

06. All the following drains are considered active postoperative drains that are attached to an external force EXCEPT

(A) sump

(B) chest

(C) Penrose

(D) Hemovac

07. During a laparoscopic cholecystectomy, the surgeon generally stands

(A) at the right side of the patient

(B) at the bottom of the patient’s table

(C) at the left side of the patient

(D) in front of the first assistant

08. Gastrointestinal decompression during a general surgical procedure can be effected by the use of a

- (A) Levine tube
- (B) Miller–Abbot tube
- (C) Vari-Dyne
- (D) Both A and B

09. A selected alternative to a conventional ileostomy that denies spontaneous stool exiting from the stoma and requires catheterization of the stoma daily to evacuate the contents is a/n

- (A) cecostomy
- (B) ileoanal pull-through
- (C) ileal conduit
- (D) Kock pouch

10. When both direct and indirect hernias occur in the same inguinal area, the defect is termed

- (A) sliding
- (B) pantaloon
- (C) femoral
- (D) spigelian

11. An inguinal hernia containing a Meckel’s diverticulum is called a

- (A) Richter's
- (B) Littre's
- (C) Maydl's
- (D) spigelian

12. Which muscles are incised in the midline of the neck once the skin flaps are completed during a thyroidectomy?

- (A) Sternocleidomastoid
- (B) Strap
- (C) Sternothyroid
- (D) Sternoclavicular

13. Which bone is transected with bone-cutting forceps before removal of a thyroglossal cyst?

- (A) Ethmoid
- (B) Hyoid
- (C) Pterygoid
- (D) Zygomatic process

14. Drainage of an incision following a simple or modified radical mastectomy is accomplished by a

- (A) Penrose
- (B) sump

- (C) closed-wound drainage
- (D) cigarette drain

15. During laparoscopic cholecystectomy, the camera operator usually stands

- (A) across from the surgeon
- (B) to the right of the surgeon
- (C) to the right of the first assistant
- (D) behind the Mayo stand

16. The maximum pressure allowed to prevent the possible intraoperative complications of bradycardia, blood pressure changes, or potential gas emboli during a laparoscopic procedure is

- (A) 8mmHg
- (B) 10 mm Hg
- (C) 15 mm Hg
- (D) 20 mm Hg

17. Place tissue layers of the abdominal wall in their correct order from the outside in: (1) fascia, (2) skin, (3) peritoneum, (4) subcutaneous, (5) Muscle.

- (A) 1, 2, 3, 4, 5
- (B) 2, 3, 4, 5, 1
- (C) 2, 4, 1, 5, 3

(D) 3, 5, 1, 4, 2

18. What is the technique used on a laparoscopic direct inguinal hernia repair where the peritoneal space is inflated with a balloon dissector?

(A) TEP (total extraperitoneal)

(B) Hasson

(C) TAPP (transabdominal preperitoneal laparoscopy)

(D) Open

19. When viscera has protruded outside of the body, this condition is called

(A) dehiscence

(B) evisceration

(C) ischemia

(D) fistula

20. The position which facilitates a symmetrical outcome during a mastopexy is

(A) supine

(B) dorsal recumbent

(C) Fowler's

(D) lateral

21. Which breast reconstruction procedure reconstructs

the breast without the use of implants?

- (A) TRAM
- (B) TEP
- (C) PPE
- (D) Augmentation

22. The procedure where a hooked wire is inserted under fluoroscopy into the suspicious tissue is called

- (A) a hook wire
- (B) wire localization
- (C) staging
- (D) frozen section

23. What procedure involves injection of dye and/or a radioactive material into the breast mass to track the lymph nodes?

- (A) Stereotaxis
- (B) Excisional biopsy
- (C) Staging
- (D) Sentinel node biopsy

24. What is the correct order from the outermost to the innermost tissue layers that make up the wall of the stomach: (1) serosa, (2) mucosa, (3) muscularis, (4) submucosa.

- (A) 1, 2, 3, 4
- (B) 4, 3, 2, 1
- (C) 3, 2, 1, 4
- (D) 2, 3, 4, 1

25. The pancreatic duct (the duct of wirsung) and the common bile duct from the liver drain their contents into this section of the intestine:

- (A) jejunum
- (B) ileum
- (C) cecum
- (D) duodenum

26. A sheet of vascular tissue that supplies blood and lymph to the lower section of the small intestines is

- (A) omentum
- (B) stoma
- (C) mesentery
- (D) cecum

27. Arrange the large intestine in correct order from proximal to distal is (1) rectum, (2) transverse colon, (3) ascending, (4) sigmoid, (5) descending.

- (A) 1, 2, 3, 4, 5

- (B) 3, 2, 5, 4, 1
- (C) 2, 3, 4, 1, 5
- (D) 2, 3, 4, 5, 1

28. A condition that causes bowel obstruction when one section of intestine telescopes over another and mostly occurs in children is

- (A) evisceration
- (B) Crohn disease
- (C) gastroschisis
- (D) intussusceptions

29. A congenital defect where the abdominal contents are outside the body at birth is

- (A) hiatal hernia
- (B) diverticular disease
- (C) Crohn disease
- (D) omphalocele

30. Bowel is also known as

- (A) abdominal technique
- (B) isolation technique
- (C) resection technique
- (D) Both A and C

31. What kind of tube is used to decompress the stomach or as a means of feeding the patient?

- (A) Nasogastric tube
- (B) Esophageal tube
- (C) Gastrostomy tube
- (D) T-tube

32. During a laparotomy, the surgeon packs the abdominal contents away from the diseased area with

- (A) Raytec 4 × 4s
- (B) Moist laps
- (C) Gelfoam and thrombin
- (D) Dry laps

33. During a laparotomy procedure, the duties of the STSR include:

- (A) 4 × 4s and needles must be mounted on appropriate clamps on Mayo stand
- (B) Keep the ESU free of debris and in its holster
- (C) Keep surgical field free of instruments not in use
- (D) All of the above

34. An esophageal diverticulum is also known as

- (A) hiatal hernia

- (B) GERD
- (C) Hirschsprung disease
- (D) Zenker diverticulum

35. In what procedure is a portion of the stomach removed with an anastomosis created between the stomach and a jejunum?

- (A) Bilroth I
- (B) Bilroth II
- (C) Jejunectomy
- (D) Gastrectomy

36. The procedure traditionally performed to treat gastric ulcers and gastric carcinoma and is currently used to treat morbid obesity is

- (A) Roux en y
- (B) band gastroplasty
- (C) Bilroth I
- (D) None of the above

37. Morbid obesity is defined as BMI (body mass index) greater than

- (A) 30
- (B) 40
- (C) 10

(D) 25

38. A common staple gun used to transect the stomach is _____ and the _____ gun is used to transect and anastomose the jejunum during a Bilroth II procedure.

- (A) EEA, LDS
- (B) TA, GIA
- (C) Hemoclamp, GIA
- (D) Purstring, LDS

39. The portion of the small intestine where a Meckel's diverticulum arises is the

- (A) duodenum
- (B) jejunum
- (C) pylorus
- (D) distal ileum

40. Twisting of the bowel is known as

- (A) strangulation
- (B) intussusception
- (C) volvulus
- (D) paralytic ileus

41. The procedure to treat venous distention causing pain, bleeding, and a prolapse outside the anal canal is known

as

- (A) anorectal fistulectomy
- (B) pilonidal cystectomy
- (C) hemorrhoidectomy
- (D) proctoscopy

42. The pancreatic duct is also known as

- (A) Ampulla of Vater
- (B) Duct of Wirsung
- (C) Sphincter of Oddi
- (D) Circle of Willis

43. Which tube may be inserted to produce a continuous postoperative drainage of the common bile duct?

- (A) Nasogastric tube
- (B) Levine tube
- (C) T-tube
- (D) Foley

44. A choledochoduodenostomy is an anastomosis between the

- (A) pancreas and common bile duct
- (B) common bile duct and duodenum
- (C) gallbladder and duodenum

(D) Both B and C

45. A Whipple procedure consists of removal of

(A) pancreas, duodenum, jejunum, stomach, and common bile duct

(B) portion of pancreas, duodenum, portion of jejunum, distal stomach, and distal portion of common bile duct

(C) duodenum, jejunum, distal stomach, and gallbladder

(D) head of pancreas, portion of liver, gallbladder, and common bile duct

Answers and Explanations

- 1. (A)** In a gastrointestinal closure, the mucosal layer is closed with chromic 4–0 or 3–0; the seromuscular layer is closed with chromic 3–0 or 2–0 and silk 4–0 or 3–0 (Meeker and Rothrock).
- 2. (B)** A purse-string suture is a continuous suture placed around a lumen and tightened, drawstring fashion, to close the lumen. This is used, for example, when inverting the stump of an appendix or when closing the anus in the perineal stage of an abdominoperineal resection (Meeker and Rothrock).
- 3. (A)** A bumper is passed over or through the exposed portion of suture in a retention suture to prevent the suture from cutting into the skin surface (Meeker and Rothrock).
- 4. (B)** An antireflux procedure, which prevents reflux of gastric juices back into the esophagus. The three most frequently performed procedures are Nissen, Hill, and Belsey Mark IV (Meeker and Rothrock).
- 5. (A)** Kitner dissecting sponges are small rolls of heavy

cotton tape that are held in forceps (Fortunato).

- 6. (D)** Pressure dressings are used frequently following extensive operations, especially in plastic surgery, knee operations, and radical mastectomies (Fortunato).
- 7. (B)** Patties are moistened with saline and pressed out flat on a metal surface. They could pick up lint if placed on a towel (Fortunato).
- 8. (B)** Normal saline is usually used to moisten sponges and tapes because it is an isotonic solution (Fortunato).
- 9. (A)** Hand specimen from the field in a basin, on a piece of paper wrapper, or on a towel. Never place specimen on a sponge that may leave the OR and disrupt the sponge count (Fortunato).
- 10. (A)** Mushroom, Malecot, or Foley catheters are frequently used in the anterior gastric wall and are held in place by a purse-string suture (Meeker and Rothrock).
- 11. (D)** Moisten the drain in saline before handing it to the surgeon (Fortunato).

- 12. (B)** This portable system is used to apply suction to a large closed-wound site postoperatively. A constant, negative vacuum evacuates tissue fluid and blood to promote healing by reducing edema and media for microbial growth (Meeker and Rothrock).
- 13. (B)** Covering sterile tables for later use is not recommended because it is difficult to uncover a table without contamination (Fortunato).
- 14. (C)** Hands are kept at or above waist level, away from the face and arms, and never folded, because there may be perspiration in the axillary region (Fortunato).
- 15. (C)** The end-to-end anastomoser (EEA) is designed to hold two tubular structures, to join the structures with staples, and to cut the structures internally so proper lumen is provided (Meeker and Rothrock).
- 16. (B)** Anything falling or extending over a table edge is unsterile. The scrub person does not touch the part hanging below table level (Fortunato).
- 17. (C)** Sitting or leaning against a nonsterile surface is a break in technique because a sterile person should keep contact with nonsterile areas to a minimum

(Fortunato).

- 18. (A)** If sterility is doubtful, consider it not sterile. Do not use a pack, even if it appears to be sterile, if it is found in a nonsterile workroom (Fortunato).
- 19. (C)** The sphincter of Oddi is located at the most distal end of the ampulla of vater. It may become scarred because of biliary obstruction, stones, or disease. Transecting the duodenum at the site of the sphincter allows the surgeon to reduce the stenosis and encourage the flow of bile and pancreatic juices into the gastrointestinal system (Meeker and Rothrock).
- 20. (B)** The scrub who hands the drapes to the surgeon should stand on the same side of the table in order to avoid reaching over the unsterile OR table (Fortunato).
- 21. (B)** Do not recap used injection needles (Fortunato).
- 22. (C)** Drapes should be carried to the OR table folded to prevent them from coming in contact with unclean items in transport (Fortunato).
- 23. (C)** A hair found on a drape must be removed with a

hemostat; hand instrument off of field, and cover the area with a suitable drape (Fortunato).

- 24. (B)** To minimize the risk of disseminating malignant tumor cells outside the operative area, some surgeons follow a special technique in which instruments in contact with tumor cells are discarded after use (Fortunato).
- 25. (D)** Gown, gloves, drapes, and instruments are changed. The tumor is incised during biopsy for diagnosis. However, margins of healthy tissue surrounding a radical resection must not be inoculated with tumor cells (Fortunato).
- 26. (A)** The postoperative complication of powder granulomata can result from powder that is not properly removed from gloves before surgery. This can be avoided by rinsing gloves before approaching the operative site (Fortunato).
- 27. (B)** Sterile dressings should be applied before drapes are removed to reduce risk of the incision being touched by contaminated hands or objects (Fortunato).
- 28. (C)** In bowel technique, the contaminated instruments

are discarded in a single basin. Gloves (and possibly gowns) are changed by the surgical team, and the incisional area is re-draped with clean towels (Fortunato).

- 29. (B)** Decontaminate floor and walls promptly during operation if contaminated by organic debris. Use a broad-spectrum detergent disinfectant and wear gloves. This action helps prevent microorganisms from drying and becoming airborne (Fortunato).
- 30. (A)** A Sengstaken–Blakemore tube is used to control esophageal hemorrhage. Pressure is exerted on the cardiac portion of the stomach and against bleeding esophageal varices by a double balloon tamponade. It is a three-element gastric tube (Mosby’s Medical, Nursing, and Allied Health Dictionary, 5th ed.).
- 31. (D)** Oxycel’s hemostatic action is caused by the formation of an artificial clot by cellulose action as it reacts with blood. It increases in size to form a gel and stops bleeding. It is used dry (Fortunato).
- 32. (C)** Thrombin accelerates coagulation of blood and controls capillary bleeding. It is an enzyme derived from bovine blood (Fortunato).

- 33. (C)** Extubation is precarious for the patient who may cough, jerk, or experience a spasm of the larynx from tracheal stimulation. Hypoxia is a common complication. It is a deficiency in oxygen (Fortunato).
- 34. (C)** The Trendelenburg position is used for procedures in the lower abdomen or pelvis in which it is desirable to tilt the abdominal viscera away from the pelvic area for better exposure. The entire table is tilted downward (about 45 degrees at table head) while the foot is also lowered the desired amount (Fortunato).
- 35. (D)** The Kraske position is also called the jackknife position. The patient is anesthetized in supine position. He or she is turned to the abdomen with the hips over the center break in the table (Fortunato).
- 36. (C)** Sponges should be kept away from linen, instruments, and needles. Sponges and tapes should not be in a basin at the same time because a small sponge may be dragged unknowingly into the wound along with a tape. Keep a mental count of the number of sponges on the field (Fortunato).
- 37. (D)** Hypoxia is lack of adequate amounts of oxygen; if prolonged, it can result in cardiac arrhythmia or

irreversible brain, liver, kidney, and heart damage. The treatment is immediate adequate oxygen intake to stimulate the medullary centers and prevent respiratory system failure. Dark blood on the operative field is a symptom of hypoxia (Fortunato).

- 38. (A)** Omitted counts because of extreme patient emergency must be documented on the operative record, and a patient incident report must be completed by the circulating nurse. This is only acceptable in a life-threatening emergency (Fortunato).
- 39. (B)** Cultures are obtained under sterile conditions. The tips must not be contaminated by any other source. The circulating nurse can hold open a small bag for the scrub nurse to drop the tube into if it is handled on the sterile field. This protects personnel and prevents the spread of microorganisms (Fortunato).
- 40. (D)** Frozen section specimens are not placed in solution because they can react with tissue and affect the pathologist's diagnosis. A frozen section is the cutting of a thin piece of tissue from a frozen specimen. This permits examination under a microscope (Fortunato).

- 41. (A)** Stones are placed in a dry container to prevent dissolving. Stones are sent for additional study to determine their composition (Fortunato).
- 42. (C)** The distal end of the common bile duct is called the sphincter of Oddi and is located where the duct enters the duodenum. A transduodenal sphincterotomy is done to treat recurrent attacks of pancreatitis because it is at this junction that the pancreatic duct enters and can be obstructed because of obstruction of the common bile duct (Meeker and Rothrock).
- 43. (A)** The McBurney muscle-splitting incision is used for appendix removal. It is an 8-cm oblique incision that begins well below the umbilicus, goes through McBurney's point, and extends upward toward the right flank (Meeker and Rothrock).
- 44. (D)** The vertical midline is the simplest abdominal incision to perform. It is an excellent primary incision offering good exposure to any part of the abdominal cavity (Meeker and Rothrock).
- 45. (D)** A purse-string is a continuous suture placed around the lumen of the appendiceal stump to invert it. It is tightened, drawstring fashion, to close the

lumen (Meeker and Rothrock).

- 46. (A)** Whenever a portion of the gastrointestinal tract is entered, gastrointestinal technique must be carried out. Any instrument used after the lumen of the stomach or intestines has been entered cannot be used after it is closed. A cholecystectomy does not enter the gastrointestinal tract. An appendectomy, hemicolectomy, and an anterior resection of the sigmoid all require bowel technique (Meeker and Rothrock).
- 47. (C)** Hesselback's triangle is formed by the boundaries of the deep epigastric vessels laterally, the inguinal ligament inferiorly, and the rectus abdominis muscle medially. Hernias occurring here are direct (Meeker and Rothrock).
- 48. (B)** Gynecomastia is a relatively common pathologic lesion that consists of bilateral or unilateral enlargement of the male breast. Surgery consists of removal of all subareolar fibroglandular tissue and surgical reconstruction of the resultant defect (Meeker and Rothrock).
- 49. (C)** Retention sutures may be used as a precautionary

measure to prevent wound disruption and possible evisceration of the wound (Meeker and Rothrock).

50. (B) Pyloroplasty is the formation of a larger passage between the pylorus of the stomach and the duodenum. It may include the removal of a peptic ulcer if one is present (Meeker and Rothrock).

51. (B) A Whipple operation is a radical surgical excision of the head of the pancreas, the entire duodenum, a portion of the jejunum, the distal third of the stomach, and the lower half of the common bile duct. There is then reestablishment of continuity of the biliary, pancreatic, and gastrointestinal systems. This is done for carcinoma of the head of the pancreas and is a hazardous procedure (Meeker and Rothrock).

52. (C) A left subcostal incision is generally used for spleen surgery. The right subcostal is used for gallbladder, common bile duct, and pancreatic surgery (Meeker and Rothrock).

53. (B) A lower oblique incision, either right or left, is an inguinal incision. This incision gives access to the inguinal canal and cord structures (Meeker and Rothrock).

- 54. (C)** The Pfannenstiel incision is frequently used for pelvic surgery. It is a curved transverse incision across the lower abdomen, 1.5 inches above the symphysis pubis. It provides a strong closure (Meeker and Rothrock).
- 55. (C)** A modified radical mastectomy involves removal of the involved breast and all three levels of axillary contents. The underlying pectoral muscles are not removed (Meeker and Rothrock).
- 56. (B)** Simple mastectomy is removal of the entire breast without lymph node dissection, performed to remove extensive benign disease or a confined malignancy (Meeker and Rothrock).
- 57. (C)** The diseased portion of the esophagus and stomach are removed through a left thoracoabdominal incision, including a resection of the seventh, eighth, or ninth ribs. Here, an anastomosis is accomplished between the disease-free ends of the stomach and the esophagus (Meeker and Rothrock).
- 58. (A)** Retention or tension sutures may be used in a vertical midline incision to ensure strength of closure and support (Meeker and Rothrock).

- 59. (C)** The great danger of an incarcerated hernia is that it may become strangulated—the blood supply of the trapped sac contents becomes compromised, and eventually the sac contents necrose (Meeker and Rothrock).
- 60. (C)** Direct hernias protrude into the inguinal canal but not into the cord (Meeker and Rothrock).
- 61. (D)** Indirect hernias leave the abdominal cavity at the internal ring and pass with the cord structures down the inguinal canal, thus the indirect hernia sac may be found in the scrotum (Meeker and Rothrock).
- 62. (A)** A synthetic Gore-Tex patch is a popular method for reconstruction of abdominal wall defects. Mersilene, a synthetic, is also used for its strength and durability (Meeker and Rothrock).
- 63. (D)** Synthetic meshes, such as Mersilene or Martex, are helpful in repair of recurrent hernias requiring a strong repair (Meeker and Rothrock).
- 64. (A)** In cholecystectomy there is exposure of the neck of the gallbladder, the cystic duct, and the cystic artery. The cystic artery and duct are doubly ligated

and divided, facilitating gallbladder removal (Meeker and Rothrock).

65. (D) In a pilonidal cystectomy, the cyst and sinus tract must be completely removed to prevent recurrence (Meeker and Rothrock).

66. (B) A cholangiocath is prepared using a 20-cc syringe of saline and a 20-cc syringe of contrast medium using a stopcock and Leuer-lock ports. All air bubbles are removed because they may be misinterpreted as gall duct stones on X-ray. The cholangiocath is irrigated with saline before and during the catheter insertion into the cystic duct and CBD (Meeker and Rothrock).

67. (B) A Lahey vulsellum forceps is used to grasp and elevate the thyroid lobe so that sharp dissection of the lobe away from the trachea can be accomplished (Meeker and Rothrock).

68. (B) The layers of the large intestine from inside to outside are mucosa, submucosa, and serosa. Mucosa suture closure is most frequently absorbable suture, while the serosa layer is closed with nonabsorbable silk (Tortora and Grabowski).

- 69. (D)** Postoperative shoulder pain may follow use of pneumoperitoneum. This is referred pain caused by pressure on the diaphragm, which is somewhat displaced by CO₂ during the procedure (Fortunato).
- 70. (D)** A subphrenic abscess is a liver abscess that may require incision and drainage (Meeker and Rothrock).
- 71. (C)** For hepatic resection, supplies and equipment should be available for hypothermia, electrosurgery, measurement of portal pressure, thorocotomy drainage, and replacement of blood loss (Meeker and Rothrock).
- 72. (B)** Splenectomy is removal of the spleen, usually performed for trauma to the spleen, for specific conditions of the blood such as hemolytic jaundice or splenic anemia, or for tumors, cysts, or splenomegaly (Meeker and Rothrock).
- 73. (B)** Petroleum gauze packing is placed in the anal canal. A dressing and a T-binder are applied (Meeker and Rothrock).
- 74. (C)** Excision of an anal fissure involves the dilation of the anal sphincter and removal of the lesion. Anal

fissures are benign lesions of the anal wall (Meeker and Rothrock).

- 75. (D)** An intraoperative cholangiogram is usually performed in conjunction with cholecystectomy to visualize the common bile duct and the hepatic ductal branches and to assess patency of the common bile duct (Meeker and Rothrock).
- 76. (D)** The defect resulting from recurrences may become too large for primary closure. In this case, the wound is left opened to heal by granulation. The wound is packed and a pressure dressing is applied (Meeker and Rothrock).
- 77. (C)** After the abdomen is opened through a McBurney's incision, the mesoappendix is grasped with a Babcock and the appendix is gently dissected away from the cecum (Meeker and Rothrock).
- 78. (C)** The CO₂ laser may be used for vaporization and coagulation of hemorrhoidal tissue (Meeker and Rothrock).
- 79. (C)** In an excisional biopsy, the entire tumor mass is excised. In a needle biopsy, a plug of tissue is

removed. In an incisional biopsy, a portion of the mass is excised (Meeker and Rothrock).

80. (B) Varicosities of veins in the anus and rectum are called hemorrhoids. They may occur externally or internally. They must be ligated and ligatured after the sphincter of the anus is dilated (Fortunato).

81. (B) A temporary colostomy is performed to decompress the bowel or give the bowel a rest and time to heal after inflammation (Meeker and Rothrock).

82. (A) A low colon lesion may require an abdominoperineal resection and colostomy. The EEA (end-to-end anastomosis) is a stapling device that allows a very low anastomosis and thus avoids a colostomy (Meeker and Rothrock).

83. (A) Advanced inflammation of the colon is frequently treated with a temporary colostomy, often done to decompress the bowel or give the bowel a rest (Meeker and Rothrock).

84. (D) Blunt dissection, using a Kitner or peanut, is employed when removing the gallbladder from the

infundibulum up to the fundal region (Meeker and Rothrock).

85. (C) Choledochoscopy is direct visualization of the common bile duct by means of an instrument (choledochoscope) introduced into the common bile duct. This takes the place of cholangiography in difficult cases (Meeker and Rothrock).

86. (D) The surgeon marks the incision site with a “scratch” of a scalpel in the normal neck creases and skin lines, which helps to ensure a wound line that blends with the patient’s neck anatomy (Meeker and Rothrock).

87. (D) A Fogarty-type balloon-tipped catheter is used to facilitate the removal of small stones and debris as well as to demonstrate patency of the common bile duct through the duodenum (Meeker and Rothrock).

88. (C) To test for tubal patency during laparoscopy, diluted methylene blue or indigo carmine solution is injected through the intrauterine cannula in the cervical canal. If the fallopian tubes are patent, dye can be seen at fimbriated ends (Meeker and Rothrock).

- 89. (D)** The sternocleidomastoid muscle is retracted with loop retractors (Meeker and Rothrock).
- 90. (A)** Care is taken throughout thyroid surgery to identify and preserve parathyroid glands. Removal of all parathyroid tissue results in severe tetany or death (Meeker and Rothrock).
- 91. (B)** Morbid obesity and bariatric surgery have been developed for people who weigh more than 100 lb over ideal weight (Fortunato).
- 92. (B)** The groin area contains the superficial group of muscles, the obliques, and Scarpa's fascia. An inguinal herniorrhaphy requires incision of Scarpa's fascia (Meeker and Rothrock).
- 93. (A)** A gastroplasty treats obesity by resecting the stomach to reduce its capacity (Fortunato).
- 94. (B)** A Penrose drain is used to retract the spermatic cord structures for better exposure (Meeker and Rothrock).
- 95. (A)** After the cervix is dissected and amputated from the vagina, the uterus is then removed. Potentially

contaminated instruments used on the cervix and vagina are placed in a discard basin and removed from the field (sponge sticks and suction as well) (Meeker and Rothrock).

96. (A) An irreducible hernia is one in which the contents of the hernia sac are trapped in the extraabdominal sac (incarcerated) (Meeker and Rothrock).

97. (C) With a three-chip camera, each chip picks up only one of the primary colors. Because each chip sees the entire image, there is no need to infer the color that should appear on the screen. Three-chip cameras provide truer color (Ball).

98. (D) To balance a video camera, the scrub person must focus the camera on a white sponge wrapper or wall to create a fixed point of reference for all other colors (Ball).

99. (D) Fogging occurs when the light going through the scope warms the air between the eyepiece and the coupler and causes trapped air to evaporate. To avoid fogging, the scrub person must make sure that the entire area is dry before assembling and uses an antifogging agent on the lens (Ball).

- 00. (C)** Gastrostomy is a palliative procedure performed to prevent malnutrition or starvation. These may be caused by a lesion or stricture situated in the esophagus or cardia of the stomach (Meeker and Rothrock).
- 01. (B)** Cholelithotripsy is a noninvasive procedure, done generally under IV sedation using spark-gap shockwaves generated by an electrode and passed on through the fluid medium into the body, focused at the stone with an ultrasound probe until they reach the stone (Fortunato).
- 02. (B)** T-tubes are used to stent a common bile duct after common duct exploration. Red rubber catheters can be used to irrigate postoperatively. Cholangiocaths are plastic catheters used to insert dye into the common bile duct before X-ray or fluoroscopy (Fortunato).
- 03. (D)** Gas flow is initiated at 1–2 L/min. The intra-abdominal pressure is normally in the 10–14 mm Hg range and is used as an indicator for proper Verres needle placement. If the gauge indicates a higher pressure, the needle may be in a closed space such as fat, buried in omentum, or in a lumen of intestines (Meeker and Rothrock).

- 04. (D)** Following irrigation of the liver bed, the scope and camera are moved to the upper mid-line sheath. Large grasping forceps are inserted into the umbilical sheath, and the gallbladder is pulled through. An endobag may be used to contain the specimen. If the gallbladder is too large to be extracted, the neck is brought to the surface, incised, and decompressed with a suction before removal (Meeker and Rothrock).
- 05. (D)** The use of fluid-impervious bags eliminates potential contamination from wet linen soaking through. All linens from open packs, whether soiled or not, should be discarded in fluid-impervious bags (Meeker and Rothrock).
- 06. (C)** Sump, chest, and Hemovac drains are all active drains attached to an external force of vacuum to create suction. The Penrose exits the wound and provides a path of least resistance for drainage into the dressing (Fortunato).
- 07. (C)** The surgeon performing the laparoscopic procedure stands at the patient's left, while his or her assistant stands at the patient's right (Stryker Endoscopy).

- 08. (D)** Both the Levine tube and the Miller–Abbot tube effect gastrointestinal decompression. The Levine tube is placed through the nasal passageway into the stomach, while the Miller–Abbot tube reaches into the small intestines (Fortunato).
- 09. (D)** An alternative to a conventional ileostomy for selected patients is the Kock pouch, or continent ileostomy. The internal pouch is constructed of small intestine with an outlet to the skin. When it is functioning properly, no stool spontaneously exits from the stoma. A catheter is inserted several times a day to evacuate the contents (Meeker and Rothrock).
- 10. (B)** When both direct and indirect hernias are present in the same patient, the defect is called a pantaloon hernia after the French word for pant, which the situation suggests (Meeker and Rothrock).
- 11. (B)** An inguinal hernia containing Meckel’s diverticulum is called Littre’s hernia; one containing two loops of bowel is called Maydl’s hernia. A special type of strangulated hernia is Richter’s hernia. A spigelian hernia is usually located as a peritoneal sac that is between the different muscle layers of the abdominal wall (Meeker and Rothrock).

- 12. (B)** After the upper and lower skin flaps are undermined at the level of the cricoid cartilage, the fascia in the midline is incised between the strap (sternohyoid) muscles with a knife. The sternocleidomastoid muscles are then retracted with loop retractors (Meeker and Rothrock).
- 13. (B)** After the head is extended, the incision is made between the hyoid bone and the thyroid cartilage through the subcutaneous tissue. Sharp and blunt dissection is used to mobilize the cyst and duct, and the hyoid bone is transected twice with bone-cutting forceps, and the cyst is freed from adjacent structures (Meeker and Rothrock).
- 14. (C)** Following meticulous hemostasis of the operative site, the wound is irrigated with normal saline, and closed wound drainage is instituted through a stab wound and secured to the skin with nonabsorbable suture and a cutting needle (Meeker and Rothrock).
- 15. (C)** The camera operator stands to the right of the first assistant, across from the scrub person. He or she must closely follow the surgeon's actions (Stryker Endoscopy).

- 16. (C)** During the procedure, the perioperative nurse should set the insufflation unit to a maximum pressure of 15 mm Hg. When intraabdominal pressure reaches 15 mm Hg, the flow will stop. Pressure higher than 15 mm Hg may result in bradycardia, a change in blood pressure, or may force gas emboli into an exposed blood vessel during the procedure (Meeker and Rothrock).
- 17. (C)** The correct order from the outside in is the skin, subcutaneous tissue, fascia, muscle and peritoneum (Fuller).
- 18. (A)** TEP approach to the peritoneal space is when a balloon dissector is used to expand tissue planes (Fuller).
- 19. (B)** Evisceration is when the viscera has protruded outside of the body (Fuller).
- 20. (C)** The Fowler's position (with the patient in the semisitting position) assists the physician with assuring symmetrical breasts (Fuller).
- 21. (A)** A transverse rectus abdominus myocutaneous flap is a tissue flap containing skin, subcutaneous, and

muscle, and is raised from the lower abdomen and transferred to the mastectomy site (Fuller).

22. (B) A wire localization is a procedure where a hooked wire is inserted under fluroscopy into the tissue suspected of being cancerous. The tissue surrounding the hook wire is removed (Fuller).

23. (D) Both materials, both the dye and the gamma ray emission, may be used to track the lymph nodes. The technetium 99 is tracked with a device similar to a Geiger counter (gamma ray detecting probe) (Fuller).

24. (A) The correct order from outermost to innermost layers of the stomach are the serosa, mucosa, muscularis, and submucosa (Fuller).

25. (D) The duodenum is the first section of the small intestines and the pancreatic and common bile duct drain here from the liver (Fuller).

26. (C) The sections of the duodenum and jejunum are suspended from the abdominal wall by a sheet of vascular tissue known as the mesentery (Fuller).

27. (B) The large intestine from proximal to distal is

ascending, transverse, descending, sigmoid, rectum (Fuller).

28. (D) Intussusception is a condition that causes bowel obstruction because one section of intestine telescopes another (Fuller).

29. (D) Omphalocele is a congenital defect where the abdominal contents are outside of the body at birth (Fuller).

30. (B) During bowel technique or isolation technique, instruments and supplies used on the bowel while open are kept separate from all other sterile items. Contaminated items are confined to the mayo or a designated basin (Fuller).

31. (C) A nasogastric tube is used to decompress the stomach or as a means of feeding the patient (Fuller).

32. (B) Moist lap pads are used to pack the abdominal contents away from the diseased area of the bowel (Fuller).

33. (D) All of the above are proper techniques (Fuller).

- 34. (D)** A pharyngo esophageal diverticulum, sometimes called Zenkers diverticulum is mucosa and submucosa that have herniated through the cricoid's pharyngeal muscles. Food particles become temporarily trapped and cause problems (Fuller).
- 35. (B)** In a Bilroth II, a portion of the stomach is removed and an anastomosis is created between the stomach and the jejunum (Fuller).
- 36. (A)** A Roux en y is done to bypass the distal stomach and reestablish continuity from the stomach to the jejunum. A large portion of the stomach is bypassed and a gastric pouch is created (Fuller).
- 37. (B)** When the BMI is at least 40, this condition is known as morbid obesity. BMI is a formula of weight and height calculated by a specific formula (Fuller).
- 38. (B)** The TA is used to staple the stomach and the GIA is used to transect and anastomose the jejunum during the Bilroth II (Fuller).
- 39. (D)** The Meckel's diverticulum occurs at the distal ileum. It arises from a congenital remnant of the umbilical duct (Fuller).

- 40. (C)** Twisting of the bowel is known as a volvulus (Fuller).
- 41. (C)** Hemorrhoids are defined as venous distention causing pain, bleeding, and a prolapse outside the anal canal (Fuller).
- 42. (B)** The Duct of Wirsung is the central duct of the pancreas. It communicates with the duodenum at the Ampula of Vater, a location shared with the common bile duct (Fuller).
- 43. (C)** A T-tube is inserted to produce continuous drainage of bile following a common duct exploration (Fuller).
- 44. (B)** A choledochoduodenostomy is an anastomosis between the common bile duct and the duodenum (Fuller).
- 45. (B)** A Whipple involves removal of a portion of the pancreas, duodenum, portion of jejunum, distal stomach, and the distal portion of the common bile duct.

CHAPTER 21

Obstetrics and Gynecology

Questions

1. When handling uterine curettings,
 - (A) never place them in preservative
 - (B) keep the endometrial and the endocervical curettings separate
 - (C) send the endometrial and the endocervical curettings to the laboratory in one container
 - (D) send them on a 4×4 to the laboratory because it is too difficult to remove them

2. Labor can be induced using
 - (A) ergotrate
 - (B) diazoxide
 - (C) Pitocin
 - (D) magnesium sulfate

3. The needle used to instill the gas during a laparoscopy is a
 - (A) Silverman
 - (B) Crile

- (C) Hegar
- (D) Verres

4. A Hulka forceps is used in

- (A) gynecologic surgery
- (B) urologic surgery
- (C) thoracic surgery
- (D) neurologic surgery

5. Which drug is given to aid in placental expulsion?

- (A) Oxytocic
- (B) Anticholinergic
- (C) Antihistamine
- (D) Hypoxic

6. A Humi cannula is used in

- (A) eye surgery
- (B) vascular surgery
- (C) urologic surgery
- (D) gynecologic surgery

7. The aim of stress incontinence operations includes all of the following EXCEPT

- (A) to improve performance of a dislodged or

dysfunctional vesical neck

(B) to restore normal urethral length

(C) to tighten and restore the anteriorurethral vesical angle

(D) to repair a congenital defect

8. A procedure done on young women who evidence benign uterine tumors but who wish to preserve fertility is a

(A) subtotal hysterectomy

(B) Wertheim procedure

(C) myomectomy

(D) Le Fort procedure

9. A procedure to prevent cervical dilatation that results in release of uterine contents is a

(A) Shirodkar

(B) Le Fort

(C) Wertheim

(D) marsupialization

10. An endoscopic investigation of the uterus and tubes is a

(A) Rubin's test

(B) hysteroqram

- (C) hysterosalpingogram
- (D) hysteroscopy

11. Sterility can be accomplished by all of the following procedures EXCEPT

- (A) laparoscopy
- (B) minilaparotomy
- (C) posterior colpotomy
- (D) culdoscopy

12. An endoscopic approach to pelvic and intraabdominal examination is

- (A) culdocentesis
- (B) hysteroscopy
- (C) pelviscopy
- (D) salpingogram

13. The procedure that provides visualization of the internal contour of the uterus is a

- (A) laparoscopy
- (B) pelviscopy
- (C) hysteroscopy
- (D) culposcopy

14. Extrauterine pregnancies can occur in the

- (A) abdominal cavity and tube
- (B) ovary and pelvic ligaments
- (C) abdominal cavity and corpus luteum
- (D) pelvic ligaments and tube

15. What gynecologic setup would include various sizes of sterile cannulas?

- (A) Cesarean
- (B) Hysterectomy
- (C) Oophorectomy
- (D) Suction curettage

16. A Foley catheter is placed into the presurgical hysterectomy patient to

- (A) record accurate intake and output
- (B) distend the bladder during surgery
- (C) avoid injury to the bladder
- (D) maintain a dry perineum postoperatively

17. What would an anterior and posterior repair accomplish?

- (A) Repair of cystocele and rectocele
- (B) Repair of vesicovaginal fistula
- (C) Repair of vesicourethral fistula

(D) Repair of labial hernia

18. An incision made during normal labor to facilitate delivery with less trauma to the mother is a/an

- (A) colpotomy
- (B) colporrhaphy
- (C) episiotomy
- (D) celiotomy

19. Cervical carcinoma in situ can be classified as

- (A) limited to the epithelial layer, noninvasive
- (B) microinvasive
- (C) clinically obvious
- (D) vaginal extension limitations

20. The fallopian tube is grasped with a

- (A) Kocher
- (B) Babcock
- (C) Kelly
- (D) Lahey

21. Reconstruction of the fallopian tube setup would include

- (A) Bowman lacrimal probes

- (B) Bakes dilators
- (C) Hegar dilators
- (D) VanBuren sounds

22. To confirm the diagnosis of ectopic pregnancy, it is sometimes necessary to perform a

- (A) Rubin's test
- (B) culdocentesis
- (C) paracentesis
- (D) laparotomy

23. Cervical conization is accomplished using all of the following EXCEPT

- (A) scalpel
- (B) cautery
- (C) laser
- (D) sclerosing solution

24. The most commonly identified ovarian cyst is the

- (A) chocolate
- (B) follicle
- (C) serous cystadenoma
- (D) dermoid

25. A herniation of the cul-de-sac of at the Pouch of

Douglas is a/an

- (A) cystocele
- (B) rectocele
- (C) hydrocele
- (D) enterocele

26. A vesicourethral abdominal suspension is known as a

- (A) LeFort
- (B) Wertheim
- (C) Marshall–Marchetti
- (D) Shirodkar

27. A condition causing leakage of urine into the vagina is a/an

- (A) ureterovaginal fistula
- (B) cystocele
- (C) vesicovaginal fistula
- (D) rectovaginal fistula

28. What special technique is employed during a hysterectomy?

- (A) Discard instruments used on cervix and vagina
- (B) Use second set for closure
- (C) Redrape for closure

(D) Remove Foley before uterus is removed

29. Papanicolaou indicates

- (A) removal of small pieces of cervix for examination
- (B) cytologic study of cervical smear
- (C) staining of the cervix for study
- (D) direct visualization of pelvic organs

30. A technique employed for cervical biopsy is

- (A) random punches
- (B) multiple punches at 3, 6, 9, and 12 o'clock
- (C) one central punch at os
- (D) one inferior and one superior punch

31. In a cesarean birth, the uterus is opened with a knife and extended with a/an

- (A) Metzenbaum
- (B) Heaney
- (C) iris scissor
- (D) bandage scissor

32. At which point in a cesarean is a bulb syringe used?

- (A) When the membranes are incised
- (B) When the fetal head is delivered

- (C) When the entire infant is delivered
- (D) After placental delivery

33. Oxytocics are given in a cesarean after the baby's shoulders are delivered

- (A) to contract the uterus
- (B) to relax the uterus
- (C) to prolong the contraction
- (D) to facilitate membrane rupture

34. When closing a uterus in a cesarean, the edges of the uterine incision are clamped with which of the following?

- (A) Allis
- (B) Kocher
- (C) Pennington
- (D) Babcock

35. Intraoperative chromotubation can be effected by all of the following surgical cannulae EXCEPT

- (A) Humi
- (B) Rubin
- (C) Hui
- (D) Hulka

36. What suture would be placed into the wall of a large ovarian cyst before aspiration of its contents and final removal?

- (A) Mattress
- (B) Suture ligation
- (C) Purse-string
- (D) Figure-of-eight

37. What is the preferred procedure for recurrent or persistent carcinoma of the cervix after radiation therapy has been completed?

- (A) Wertheim's
- (B) Pelvic exenteration
- (C) Abdominal perineal resection
- (D) Low-anterior resection

38. Which of the following instruments would be used to grasp the anterior cervix of the uterus just before dissection from the vaginal vault during a total abdominal hysterectomy?

- (A) Allis
- (B) Heaney
- (C) Phaneuff
- (D) Kelly

39. Laparoscopic tubal occlusion may utilize all of the following methods of effecting sterilization EXCEPT

- (A) bipolar coagulation
- (B) Silastic bands
- (C) Surgitie ligating loop
- (D) spring clip

40. A holding instrument not found in a vaginal procedure is a

- (A) Jacobs
- (B) Lahey
- (C) Staude
- (D) Skene

41. Conization of the cervix may be accomplished by all of the following EXCEPT

- (A) scalpel
- (B) Thomas uterine curette
- (C) laser
- (D) electrocautery

42. An enterocele differs diagnostically from a rectocele by its contents and its position in the perineum. Its location is in the

- (A) Pouch of Douglas
- (B) anterior vaginal wall
- (C) posterior vaginal wall
- (D) pelvic floor

43. Pelviscopy differs from laparoscopy in the

- (A) utilization of a larger trocar and scope
- (B) utilization of auxiliary ports for ancillary instrumentation
- (C) utilization of a 30-degree angled scope
- (D) Both A and C

44. A Stamey endoscopic procedure is performed to

- (A) suspend the vesicle neck
- (B) correct anterior wall prolapse
- (C) correct posterior wall prolapse
- (D) repair a bladder laceration

45. What is the name given to a radical vaginal hysterectomy?

- (A) Exenteration
- (B) Schauta
- (C) Wertheim's
- (D) LeFort

46. What surgical procedure provides obliteration of the vagina by denuding and approximating the anterior and posterior walls of the vagina?

- (A) Vaginoplasty
- (B) Colpocleisis
- (C) Colpoperinorrhaphy
- (D) Colporrhaphy

47. The hysteroscope may be used to identify or remove all of the following EXCEPT

- (A) fallopian adhesions
- (B) lost intrauterine devices (IUDs)
- (C) intrauterine adhesions
- (D) submucosa fibroids

48. Needle aspiration of the cul-de-sac is surgically termed

- (A) colpocleisis
- (B) culdocentesis
- (C) culdotomy
- (D) colpotomy

49. An alternative to abdominal hysterectomy utilizing an endoscope is surgically termed a/an

- (A) laparoscopic-assisted vaginal hysterectomy (LAVH)
- (B) LEEC
- (C) pelviscopic-assisted vaginal hysterectomy (PAVH)
- (D) Both A and C

50. What procedure cannot be performed through a pelviscope?

- (A) Ovarian cystectomy
- (B) Hysterectomy
- (C) Oophorectomy
- (D) Adhesiolysis

51. Endometrial ablation is performed to correct

- (A) amenorrhea
- (B) metrorrhagia
- (C) menorrhagia
- (D) endometriosis

52. Endoscopic visualization of the uterine cavity is called

- (A) pelviscopy
- (B) laparoscopy
- (C) hysteroscopy
- (D) colposcopy

53. Marsupialization of a Bartholin cyst involves the

- (A) suturing the posterior wall of the cyst to the skin edges
- (B) removal of anterior wall of cyst
- (C) draining cyst contents
- (D) Both A and B

54. What is the self-retaining retractor used in vaginal procedures?

- (A) O'Sullivan–O'Conner
- (B) Gelpi
- (C) Graves
- (D) Auvard

55. Extrauterine disease of the female reproductive system may utilize any of the following lasers via a colposcope or laparoscope EXCEPT

- (A) CO₂
- (B) Nd:YAG
- (C) Candela
- (D) argon

56. A postoperative complication of the GYN patient in lithotomy position for an extended period of time is

- (A) emboli
- (B) hypertension
- (C) ulnar nerve damage
- (D) hemorrhage

57. A benign smooth muscle tumor of the uterus which causes abnormal uterine bleeding lead to anemia is

- (A) dermoid
- (B) endometriosis
- (C) leiomyoma
- (D) cystocele

58. What incision is commonly used for a C-section?

- (A) Mcburney
- (B) Upper midline
- (C) Lower paramedian
- (D) Pfannenstiel

59. Premature separation of the placenta from the uterine wall is

- (A) placenta prolapsed
- (B) placenta previa
- (C) nuchal cord
- (D) placentia abruption

60. The graft used for a vaginoplasty is

- (A) full thickness skin graft
- (B) biological skin graft
- (C) split thickness skin graft
- (D) supcutaneous connective tissue

61. When all products of conception are expelled and surgical intervention is NOT necessary, it is a

- (A) incomplete abortion
- (B) complete abortion
- (C) missed abortion
- (D) D & C

62. A cyst that is formed from the germ layer from the developing embryo is called a

- (A) teratoma (dermoid)
- (B) leiomyoma
- (C) fibroid
- (D) endometrial cyst

63. Hypertension and a seizure during pregnancy is known as

- (A) preeclampsia
- (B) placenta abruption

- (C) malignant hypertension
- (D) eclampsia

64. Electrocoagulation, cryoablation, and radio frequency ablation are procedures performed for

- (A) dysfunctional uterine bleeding
- (B) malignant fibroids
- (C) benign fibroids
- (D) cervical cancer

65. LAVH is removal of the uterus by combined approach using

- (A) laparoscopic and vaginal
- (B) abdominal and vaginal
- (C) pfannenstiel and vaginal
- (D) lower midline and vaginal

66. The term describing the specimen removal in one piece is

- (A) in situ
- (B) en bloc
- (C) colon resection
- (D) None of the above

67. The umbilical cord proceeding the fetal head is

- (A) placenta abruption
- (B) placenta previa
- (C) cord prolapsed
- (D) nuchal cord

68. All of the following are uterine ligaments EXCEPT

- (A) broad
- (B) round
- (C) cardinal
- (D) transcervical

A 29-year-old pregnant presents to the emergency room complaining of severe abdominal pain, referred pain to the shoulder and bleeding. The transvaginal ultrasound shows an absence of an intrauterine pregnancy.

69. The tests show that the fertilized egg implanted itself outside the uterus. She is diagnosed with

- (A) ectopic pregnancy
- (B) incompetent cervix
- (C) complete abortion
- (D) ovarian cyst

70. She is scheduled for

- (A) Laparoscopic removal of ectopic
- (B) Exploratory laparotomy for ectopic
- (C) Ovarian cystectomy
- (D) Both A and B

71. The position when the surgeon chooses an open approach for emergent surgery for ectopic pregnancy is

- (A) lithotomy
- (B) supine with a wedge under the affected side
- (C) supine
- (D) reverse Trendelenberg

72. The surgery performed to remove the embryo while preserving the tube is

- (A) salpingoopherectomy
- (B) salpingectomy
- (C) salpingostomy
- (D) oopherectomy

73. The affected tube is grasped with

- (A) Babcock
- (B) Allis
- (C) Mixer

(D) Kocher

74. Pathology of an ectopic pregnancy includes all
EXCEPT

(A) an STD

(B) previous tubal surgery

(C) exercising during first trimester

(D) smoking

Answers and Explanations

- 1. (B)** The endometrial curettings should be kept separate from the endocervical curettings. Fractional curettage specimens differentiate between the endocervical and the endometrium of the corpus, which helps to locate a lesion more specifically (Fortunato).
- 2. (C)** Pitocin is used to induce active labor or to increase the force or rate of existing contractions during delivery. It may be given postpartum to prevent or control hemorrhage. It acts on the uterus (Fortunato; Mosby's Medical, Nursing, and Allied Health Dictionary).
- 3. (D)** A Verres needle is inserted into the peritoneal cavity to instill the CO₂ to effect a pneumoperitoneum (Meeker and Rothrock).
- 4. (A)** In laparoscopy, a D & C may be done when indicated. After the cervix is exposed, and the position and depth of the uterus are confirmed, a Hulka forceps and uterine dilator may be introduced into the cervix to manipulate the uterus during the laparoscopy so the surgeon has better visibility (Meeker and Rothrock).

- 5. (A)** As soon as the shoulders are delivered, about 20 units of oxytocic per liter of fluid are given intravenously so the uterus contracts, aiding in expulsion of the placenta and membranes (Meeker and Rothrock).
- 6. (D)** A Humi cannula may be placed in the uterine cavity for intraoperative chromotubation with diluted methylene blue during microscopic reconstruction of the fallopian tube (Meeker and Rothrock).
- 7. (D)** The aim of any operation for urinary stress incontinence is to improve the performance of a dislodged or dysfunctional vesical neck, to restore normal urethral length, and to tighten and restore the anterior urethral vesical angle (Meeker and Rothrock).
- 8. (C)** Myomectomy is usually done on young women with symptoms that indicate the presence of benign tumors who wish to preserve fertility (Meeker and Rothrock).
- 9. (A)** The postconceptional Shirodkar operation is placement of a collar-type ligature of Mersilene, Dacron tape, heavy nylon, or plastic-covered stainless steel at the internal os to close it when there is cervical incompetence characterized by habitual, spontaneous abortion (Meeker and Rothrock).

- 10. (D)** A hysteroscopy is an endoscopic visualization of the uterine cavity and tubal orifices for evaluation of uterine bleeding, location and removal of IUDs, diagnosis, and so forth (Meeker and Rothrock).
- 11. (D)** Laparoscopy, minilaparotomy, and posterior colpotomy are viable methods to create sterility. Culdoscopy cannot be used for this purpose (Meeker and Rothrock).
- 12. (C)** Pelviscopy is an endoscopic approach to pelvic and intra-abdominal examination and/or surgery. Many procedures can be performed through the pelviscope (Meeker and Rothrock).
- 13. (C)** Hysteroscopy is an endoscopic visualization of the uterine cavity and tubal orifices (internal) (Meeker and Rothrock).
- 14. (A)** The abdominal cavity and the fallopian tube are sites of extrauterine pregnancies (ectopic). A salpingostomy done before rupture may preserve the tube (Fortunato).
- 15. (D)** A, D, and C set plus added extras, including sterile cannulas for suction curettage, is used (for early

pregnancy termination and for missed and incomplete abortions). The cannula is inserted into the uterus and suction is turned on to disrupt the sac and aspirate contents (Meeker and Rothrock).

- 16. (C)** Because pelvic procedures involve manipulation of the ureters, bladder, and urethra, an indwelling Foley or suprapubic cystostomy catheter may be placed before or during operation (Meeker and Rothrock).
- 17. (A)** Cystoceles (bulging bladder) and rectoceles (bulging rectum) occur because of weakened vaginal mucosa. Usually, the cause is traumatic childbirth, and the cure is an anterior and posterior vaginal repair (Meeker and Rothrock).
- 18. (C)** An episiotomy is an intentionally made perineal incision executed during a normal birth to facilitate delivery and prevent perineal laceration (Tortora and Grabowski).
- 19. (A)** Carcinoma in situ is limited to the epithelial layer with no evidence of invasion (Fortunato).
- 20. (B)** The fallopian tube is grasped with either an Allis

or Babcock forceps (Meeker and Rothrock).

- 21. (A)** Tuboplasty requires a basic gynecologic instrument set plus iris scissors, Adson forceps, mosquitos, Bowman lacrimal probes, Webster needle holder, and Frazier suction. A microsurgical set and laser may also be used (Meeker and Rothrock).
- 22. (B)** Aspiration of fluid or blood from the cul-de-sac of Douglas (culdocentesis) confirms intraperitoneal bleeding caused by ectopic pregnancy (Meeker and Rothrock).
- 23. (D)** Cervical conization may be performed by scalpel resection and suturing, by application of the cutting of cautery, or by use of a laser (Meeker and Rothrock).
- 24. (B)** Functional cysts comprise the majority of ovarian enlargements. Follicle cysts are the most common (Meeker and Rothrock).
- 25. (D)** An enterocele is a herniation of Douglas' cul-de-sac and almost always contains loops of the small intestine. It herniates into a weakened area between the anterior and posterior walls (Meeker and Rothrock).

- 26. (C)** A Marshall–Marchetti procedure is an abdominal approach to repairing and elevating the fascial and the pubococcygeal muscle surrounding the urethra and the bladder neck for the correction of stress incontinence (Meeker and Rothrock).
- 27. (C)** A vesicovaginal fistula may vary in size from a small opening that permits slight leakage of urine into the vagina to a large opening that permits all urine to pass to the vagina (Meeker and Rothrock).
- 28. (A)** Once the cervix is dissected away from and is amputated from the vagina, all of the potentially contaminated instruments used on the cervix and vagina are placed in a discard basin and removed from the field (includes sponge sticks and suction) (Meeker and Rothrock).
- 29. (B)** Papanicolaou is a cytologic study of smears of the cervical and endocervical tissue. Characteristic cellular changes can be identified (Tortora and Grabowski).
- 30. (B)** Multiple punch biopsies of the cervical circumference (at the 3, 6, 9, and 12 o'clock positions) may be taken with a Gaylor biopsy forceps (Meeker

and Rothrock).

- 31. (D)** The uterus is opened with a knife and extended by cutting laterally with a large bandage scissor or by simply spreading with the fingers (Meeker and Rothrock).
- 32. (B)** As soon as the head is delivered, a bulb syringe is used to aspirate the infant's exposed nares and mouth to minimize aspiration of amniotic fluid and its contents (Meeker and Rothrock).
- 33. (A)** As soon as the shoulders are delivered, about 20 units of oxytocin per liter of fluid is administered intravenously so that the uterus contracts. This minimizes blood loss and aids in placenta and membrane expulsion (Meeker and Rothrock).
- 34. (C)** The edges of the uterine incision are promptly clamped with Pean forceps, ring forceps, or Pennington clamps (Meeker and Rothrock).
- 35. (D)** Once the vagina has been prepped and an indwelling catheter is placed into the bladder, chromotubation can be effected by placing a Kahn, Calvin, Hui, Humi, or Rubin cannulae into the

cervical opening using diluted methylene blue dye to identify a nonpatent fallopian tube as visualized through a laparoscope (Meeker and Rothrock).

- 36. (C)** For removal of a large ovarian cyst, a purse-string suture may be placed into the cyst wall, and a trocar is introduced into the center to aspirate its contents before the suture is tied (Meeker and Rothrock).
- 37. (B)** Pelvic exenteration is a preferred treatment for recurrent or persistent carcinoma of the cervix. It is considered the only surgical alternative after a thorough investigation of the patient and disease status to determine if there is a reasonable chance for a cure (Meeker and Rothrock).
- 38. (A)** After the vaginal vault is incised close to the cervix during the removal of the uterus, an Allis, Kocker, or tenaculum may be used to grasp the anterior lip of the cervix (Meeker and Rothrock).
- 39. (C)** Preknotted suture loops are used to ligate pedicle tissues. Bipolar coagulation, spring clips, and Silastic bands effect occlusion of fallopian tubes (Meeker and Rothrock).

- 40. (B)** The Lahey vulsellum clamp is used to elevate the thyroid lobe during dissection. All of the others are holding instruments used to manipulate the cervix during vaginal surgery (Meeker and Rothrock).
- 41. (B)** A Thomas uterine curette is used to remove endocervical as well as endometrial tissue scrapings from the internal lining of the uterus. All other options can be used to remove the endocervical cone to treat diseased tissue and preserve fertility (Meeker and Rothrock).
- 42. (A)** An enterocele is a herniation of Douglas' cul-de-sac and almost always contains loops of the small intestine. An enterocele herniates into a weakened area between the anterior and posterior vaginal walls (Meeker and Rothrock).
- 43. (D)** Pelviscopy differs from laparoscopy in two aspects: a 10-mm pelviscope with a 30-degree angle replaces the 7-mm laparoscope with a zero-degree angle. The larger lumen allows a wider field of range (Fortunato).
- 44. (A)** Known as a Stamey procedure for female incontinence, the bladder neck is suspended by

placing sutures on both sides of the vesicourethral junction from the anterior rectus fascia into the vagina. This is aided by insertion of a cystoscope to ascertain correct needle placement through an incision into the rectus fascia (Fortunato).

45. (B) An operative approach to early carcinoma of the cervix is a radical vaginal hysterectomy called a Schauta operation. It is useful in obese patients and removes the uterus, upper third of the vagina, parametria, fallopian tubes, and ovaries (Fortunato).

46. (B) Colpocleisis (LeFort) is obliteration of the vagina by denuding and approximating the anterior and posterior walls of the vagina and is generally reserved for elderly high-risk patients with uterine prolapse (Meeker and Rothrock).

47. (A) The hysteroscope is used most commonly for endometrial laser ablation. The hysteroscope also may be used to identify and remove polyps and submucous fibroids, retrieve lost uterine devices, or lyse intrauterine adhesions (Fortunato).

48. (B) Blood, fluid, or pus in the cul-de-sac is aspirated by needle via the posterior vaginal fornix for

suspected intraperitoneal bleeding or ectopic pregnancy, or tubo-ovarian abscesses (Fortunato).

- 49. (D)** Laparoscopic-assisted vaginal hysterectomy (LAVH) or pelviscopic-assisted vaginal hysterectomy (PAVH) offers an alternative to total abdominal hysterectomy and vaginal hysterectomy (Meeker and Rothrock).
- 50. (B)** Procedures performed through a pelviscope include adhesiolysis, ovarian biopsy, ovarian cystectomy, oophorectomy, fimbrioplasty, and removal of ectopic pregnancies. Hysterectomies cannot be performed because of the solid size of the viscus (Meeker and Rothrock).
- 51. (C)** Endometrial ablation is done to treat abnormal uterine bleeding. The overall goal is to create amenorrhea or to reduce menstrual bleeding to normal. It may be an alternative to hysterectomy in some patients with chronic menorrhagia (Meeker and Rothrock).
- 52. (C)** Hysteroscopy is endoscopic visualization of the uterine cavity and tubal orifices. Laparoscopy may be done in association with hysteroscopy to assess the

external contour of the uterus (Meeker and Rothrock).

- 53. (D)** True marsupialization of the Bartholin's cyst involves the removal of the anterior wall of the cyst and suturing the cut edges of the remaining cyst to adjacent sides of the skin (Meeker and Rothrock).
- 54. (C)** A Graves self-retaining speculum frequently is known as a duckbill speculum and is used for vaginal and cervical exposure (Meeker and Rothrock).
- 55. (C)** The Candela laser is valuable to disintegrate stones in the urinary tract because it is tunable, and the wavelength can be adjusted. The CO₂, argon, and Nd:YAG are used to treat pelvic endometriosis, cervical dysplasia, condylomata, and premalignant diseases of the vulva and the vagina (Meeker and Rothrock).
- 56. (A)** SCD or antiembolic stockings are placed on the patients legs to prevent embolism (Fuller).
- 57. (C)** A leiomyoma is a benign smooth muscle tumor of the uterus (Fuller).
- 58. (D)** a low transverse, pfannenstiel or midline incision

is used to perform a C-section (Fuller).

59. (D) Placenta abruption is premature separation of the placenta from the uterine wall after 20 weeks gestation and before the fetus is delivered (Fuller).

60. (C) During the first stage of the vaginoplasty, a split thickness skin graft is taken from the buttocks or the thigh (Fuller).

61. (B) A complete abortion is the expulsion of all products of conception. Surgical intervention is not necessary (Fuller).

62. (A) A teratoma is a common ovarian tumor that arises from one of the germ layers of the developing embryo. It may contain hair, teeth, sebaceous material, and skin (Fuller).

63. (D) Eclampsia is also referred to as toxemia. Hypertension can constrict blood flow to the placenta and the fetus (Fuller).

64. (A) The goal of endometrial ablation is the destruction and scarification of the endometrium to render it nonfunctional (Fuller).

- 65. (A)** A laparoscopic-assisted vaginal hysterectomy is removal of the uterus by using a combined laparoscopic and vaginal approach (Fuller).
- 66. (B)** En bloc is a term meaning “in one piece.” In surgery, it describes the technique of removing tissue usually performed in a radical hysterectomy (Fuller).
- 67. (D)** The umbilical cord is wrapped one or more times around the fetus’ neck. This usually occurs with an active fetus seldom diagnosed before labor (Fuller).
- 68. (D)** The uterine ligaments are the broad, the cardinal, uterosacral, and round (Fuller).
- 69. (A)** In an ectopic pregnancy, the fertilized egg implants itself outside the uterus. The fallopian tube is a common site of an ectopic pregnancy (Fuller).
- 70. (A)** A laparoscopic or an open approach can be used depending on the patient’s condition and the surgeon’s choice (Fuller).
- 71. (C)** The patient is placed in supine position, prepped and draped for a laparotomy (Fuller).

- 72. (C)** A salpingostomy is an incision into the tube to remove the embryo while preserving the tube for future pregnancy (Fuller).
- 73. (A)** The tube is grasped with a Babcock which is an atraumatic (Fuller).
- 74. (C)** Risk factors of an ectopic include a previous history of a PID, smoking, previous tubal surgery history of STDs (Fuller).

CHAPTER 22

Ophthalmology

Questions

1. A sponge used in brain surgery is a/n

- (A) cottonoid patty
- (B) Kitner
- (C) impregnated gauze
- (D) porcine

2. A sponge that is cotton-filled gauze with a cotton thread attached is a

- (A) patty
- (B) tonsil
- (C) Kitner
- (D) peanut

3. In cataract surgery, a vesicoelastic drug sometimes used to occupy space in the posterior cavity of the eye is

- (A) Alpha-chymotrypsin
- (B) mannitol
- (C) Healon

(D) Wydase

4. A miotic drug is

- (A) pilocarpine
- (B) homatropine
- (C) atropine
- (D) scopolamine

5. What topical anesthetic is used most frequently for preoperative ocular instillation?

- (A) Lidocaine
- (B) Tetracaine
- (C) Cocaine
- (D) Dorsacaine

6. The drug added to a local ophthalmic anesthetic to increase diffusion is

- (A) alpha-chymotrypsin
- (B) hyaluronidase
- (C) epinephrine
- (D) Varidase

7. A solution used for eye irrigation is

- (A) phenylephrine HCl

- (B) normal saline
- (C) alpha-chymotrypsin
- (D) balanced salt solution

8. A synthetic local anesthetic that is effective on the mucous membrane and is used as a surface agent in ophthalmology is

- (A) Miochol
- (B) Zolyse
- (C) Dibucaine
- (D) tetracaine

9. Dilating eye drops are called

- (A) mydriatics
- (B) miotics
- (C) myopics
- (D) oxytocics

10. Which of the following uses ultrasonic energy to fragment the lens in extracapsular cataract extraction?

- (A) Keratome
- (B) Ocutome
- (C) Cystotome
- (D) Phacoemulsifier

11. A chalazion is a chronic inflammation of the

- (A) lacrimal gland
- (B) meibomian gland
- (C) eyelid
- (D) conjunctiva

12. What procedure is done for chronic dacrocystitis?

- (A) Extirpation
- (B) Lacrimal duct probing
- (C) Myectomy
- (D) Dacrocystorhinostomy

13. A procedure to treat retinal detachment is

- (A) scleral buckling
- (B) trabeculectomy
- (C) goniotomy
- (D) vitrectomy

14. Sagging and eversion of the lower lid is

- (A) entropion
- (B) blepharitis
- (C) ectropion
- (D) ptosis

15. Removal of the entire eyeball is

- (A) keratoplasty
- (B) exenteration
- (C) enucleation
- (D) evisceration

16. A noninvasive process to treat glaucoma by means of a slit lamp is a/n

- (A) argon or Nd:YAG laser
- (B) Cavitron I&A
- (C) phacoemulsifier
- (D) cryoprobe

17. Removal of a portion of an ocular muscle with reattachment is called

- (A) recession
- (B) resection
- (C) strabismus
- (D) myomectomy

18. Opacity of the vitreous humor is treated by performing a

- (A) cataract removal
- (B) scleral buckling procedure

- (C) vitrectomy
- (D) goniotomy

19. Miochol solution is prepared for a cataract procedure no more than _____ minutes before the actual instillation.

- (A) 5
- (B) 15
- (C) 30
- (D) 60

20. Molteno implants are used surgically to reduce intraocular pressure during

- (A) goniotomy
- (B) trabeculectomy
- (C) argon laser iridotomy
- (D) laser trabeculoplasty

21. A drug used as a lubricant and as vesicoelastic support to maintain separation of tissues before removal of lens during cataract surgery is

- (A) 5-fluorouracil
- (B) Healon
- (C) Mitomycin
- (D) Miostat

22. A drug used to contract the sphincter of the iris during an intracapsular cataract extraction is

- (A) Zolyse
- (B) Healon
- (C) Miochol
- (D) Mitomycin

23. What procedure accomplishes correction of myopia?

- (A) Keratoplasty
- (B) Keratophakia
- (C) Keratotomy
- (D) Both B and C

24. An enzymatic drug commonly used with anesthetic solutions to increase tissue diffusion is

- (A) Viscoat
- (B) epinephrine
- (C) Ophthaine
- (D) Wydase

25. Injection of anesthetic solution into the base of the eyelids or behind the eyeball to block the ciliary ganglion and nerves is known as

- (A) retrobulbar

- (B) Van Lint block
- (C) O'Brien akinesia
- (D) Bier block

26. A fleshy, triangular encroachment onto the cornea is surgically termed a/n

- (A) pterygium
- (B) chalazion
- (C) ectropion
- (D) entropion

27. A procedure performed when the cornea is thickened or opacified is called a

- (A) keratomileusis
- (B) keratotomy
- (C) corneal trephining
- (D) keratoplasty

28. What is the procedure used to correct accidental vitreous loss during a cataract extraction?

- (A) Posterior vitrectomy
- (B) Anterior vitrectomy
- (C) Pars plana vitrectomy
- (D) All of the above

- 29.** A surgical treatment for chronic wide angle-closure glaucoma that reestablishes communication between the posterior and anterior chamber of the eye is
- (A) iridectomy
 - (B) Elliot trephination
 - (C) cyclodialysis
 - (D) posterior lid sclerectomies
- 30.** Which of the following hyperosmotic drugs is given preoperatively solely by oral administration to induce osmotic pressure and thereby reduce intraocular pressure in surgery?
- (A) Diamox
 - (B) Glycerol
 - (C) Mannitol
 - (D) Urea
- 31.** What eye disease uses the argon slit lamp with a noninvasive procedure, which if successful, prevents the need for more invasive surgery?
- (A) Cataract
 - (B) Retinal detachment
 - (C) Glaucoma
 - (D) Pterigium

32. Removal of the entire contents of the orbit is

- (A) exenteration
- (B) enucleation
- (C) evisceration
- (D) orbitectomy

33. A technique used for retinal detachment which involves a cold probe is

- (A) nitrotherapy
- (B) diathermy
- (C) cryotherapy
- (D) cryodermmy

34. Keratoplasty involves surgery of the

- (A) eyelid
- (B) cornea
- (C) iris
- (D) retina

35. The photo receptive layer of the eye is

- (A) choroid
- (B) cornea
- (C) iris
- (D) retina

36. The gel-like substance that fills the posterior chamber and nourishes the tissue layers is

- (A) vitreous humor
- (B) aqueous humor
- (C) conjunctiva
- (D) healon

37. A condition caused by inadequate drainage of aqueous humor is

- (A) retinal detachment
- (B) glaucoma
- (C) entropion
- (D) cataract

38. Inflammation or infection of the lacrimal sac is

- (A) ocularitis
- (B) uveitis
- (C) iritis
- (D) dacrocystorhinitis

39. When using an anticholinergenic, such as atropine, during eye surgery, the pupils will

- (A) dilate
- (B) constrict

- (C) have no effect on the pupil
- (D) None of the above

40. Drugs that dilate the pupil but permit focusing are

- (A) cycloplegics
- (B) mydriatics
- (C) anesthetics
- (D) viscoelastics

Answers and Explanations

- 1. (A)** Cottonoid patties are compressed rayon or cotton sponges that are used moist on delicate such structures as nerves, brain, and spinal cord (Fortunato).
- 2. (B)** Tonsil sponges are cotton-filled gauze with a cotton thread attached (Fortunato).
- 3. (C)** Sodium hyaluronate (Healon) is a viscous jelly sometimes used to occupy space and prevent damage when opening the anterior capsule (Fortunato).
- 4. (A)** Pilocarpine is a miotic. A miotic causes the pupil to contract (Fortunato).
- 5. (B)** Tetracaine provides rapid, brief, and superficial anesthesia. It is widely used as a local ocular anesthetic. It is the generic name for Pontocaine (Fortunato).
- 6. (B)** Hyaluronidase is commonly added to an anesthetic solution. This enzyme increases diffusion of the anesthetic through the tissue, thereby improving the effectiveness of the block (Fortunato).

- 7. (D)** Balanced salt solution is an eye irrigant. It is used to keep the eye moist during surgery. It is supplied in a sterile solution (Fortunato).
- 8. (D)** Tetracaine produces surface anesthesia in eye surgery and is available in a 0.5% concentration for this use. Pontocaine is the trade name for this topical solution (Fortunato).
- 9. (A)** Mydriatics dilate the pupil while allowing the patient to focus. A cycloplegic drug also can dilate the pupil, but it disturbs focusing ability (Meeker and Rothrock).
- 10. (D)** In extracapsular extraction, the phacoemulsifier is used in a microsurgical technique to remove the lens. Ultrasonic energy fragments the hard lens, which can then be aspirated from the eye (Meeker and Rothrock).
- 11. (B)** Removal of a chalazion is the incision and curettage of a chronic granulomatous inflammation of one or more of the meibomian glands of the eyelid (Meeker and Rothrock).
- 12. (D)** Chronic dacryocystitis in adults requires dacryocystorhinostomy to establish a new tear

passageway for drainage directly into the nasal cavity to correct deficient drainage with overflow of tears (Meeker and Rothrock).

- 13. (A)** A scleral buckling is the operative treatment for retinal detachment. The procedure is aimed at preventing permanent vision loss by sealing off the area in which a hole or tear is located (Meeker and Rothrock).
- 14. (C)** Ectropion is the sagging and eversion of the lower lid. It is common in older patients and is corrected by a plastic procedure that shortens the lower lid in a horizontal direction (Meeker and Rothrock).
- 15. (C)** Enucleation is removal of the entire eyeball. Evisceration is removal of the contents of the eye, leaving the sclera intact (Meeker and Rothrock).
- 16. (A)** Argon or Nd:Yag laser therapy is used to treat acute (angle-closure) glaucoma and open-angle glaucoma. It is uncomplicated and utilizes a slit lamp for laser beam delivery. It is noninvasive and a fairly uncomplicated out-patient procedure (Meeker and Rothrock).

- 17. (B)** Resection of part of the ocular muscle rotates the eye toward the operated muscle, thereby strengthening it (Meeker and Rothrock).
- 18. (C)** In its normal state, the vitreous gel of the eye is transparent. In certain disease states, it becomes opaque and must be removed (Meeker and Rothrock).
- 19. (C)** Miochol solution is used to constrict the pupil to prevent vitreous loss during a cataract extraction. The Miochol solution must be used within 15 minutes after preparation. If complications arise, new solution should be prepared (Meeker and Rothrock).
- 20. (B)** Of the devices used to increase drainage from the anterior chamber, the Molteno implant has become one of the most widely used drainage devices implanted after trabeculectomy (Meeker and Rothrock).
- 21. (B)** Sodium hyaluronate functions as a lubricant and as a vesicoelastic support, maintaining a separation of tissues. It is used in intraocular procedures to protect the corneal epithelium and as a tamponade (Meeker and Rothrock).

- 22. (C)** After the lens is removed slowly from the eye, the pupil is constricted with Miochol or Miostat if an intraocular lens (IOL) is to be inserted (Meeker and Rothrock).
- 23. (D)** Radial keratotomy is a series of partial incisions in the cornea for reshaping and correction of the refractive power of the cornea. Keratophakia references a new procedure that utilizes a piece of donor corneal tissue to reshape the cornea (Meeker and Rothrock).
- 24. (D)** Wydase, also referred to as hyaluronidase, is an enzyme that increases tissue diffusion and effectiveness of nerve blocks during ophthalmology procedures (Meeker and Rothrock).
- 25. (A)** Retrobulbar anesthesia is an injection of anesthetic solution into the base of the orbital margins or behind the eyeball to block the ciliary ganglion and nerves (Meeker and Rothrock).
- 26. (A)** Pterygiums tend to be bilateral. When a pterygium encroaches on the visual axis, it is removed surgically (Meeker and Rothrock).

- 27. (D)** A corneal transplant is grafting of corneal tissue from one human eye to another. This is known as keratoplasty and is performed when one's cornea is thickened or opaque because of disease or injury (Meeker and Rothrock).
- 28. (B)** Vitreous humor may accidentally enter the anterior cavity of the eye if a miotic drug is not used during surgery. A vitreous catheter is placed through the cataract wound to remove vitreous humor and not allow it to fill the anterior chamber. It is then constricted with acetylcholine (Meeker and Rothrock).
- 29. (A)** All of the procedures treat glaucoma. Iridectomy provides a communication between the anterior and posterior chambers to relieve intraocular pressure (Meeker and Rothrock).
- 30. (B)** Glycerol and isosorbide are both given preoperatively to control intraocular pressure before ophthalmic surgery. Mannitol and urea are given parenterally, while Diamox may be given either parenterally or orally (Meeker and Rothrock).
- 31. (C)** Argon or Nd:Yag laser therapy is being used to treat acute and open angle glaucoma. It is a

noninvasive procedure and may, if successful, prevent more invasive procedures (Meeker and Rothrock).

32. (A) Exenteration is the removal of the entire contents of the orbit (Fuller).

33. (C) A technique in which a cold probe is used to freeze tissue such as sclera, ciliary body, or retinal detachment (Fuller).

34. (B) Keratoplasty is surgery of the cornea. The term penetrating keratoplasty refers to corneal transplantation (Fuller).

35. (D) The innermost layer of the posterior globe is called the retina. The retina is the posterior receptive layer of the eye. It records and transmits images to the brain via the optic nerve (Fuller).

36. (A) The vitreous humor is a gel-like substance that fills the posterior chamber (Fuller).

37. (B) Glaucoma is a disease characterized by optic nerve and visual field damage usually caused by inadequate drainage of aqueous humor (Fuller).

- 38. (D)** Dacrocystorhinitis is inflammation or inflammation of the lacrimal sac and usually arises from an obstruction of the lacrimal canal (Fuller).
- 39. (A)** Anticholinergic dilates the pupil and inhibits focusing (Fuller).
- 40. (B)** Mydriatics are drugs that dilate the pupil and permit focusing (Fuller).

CHAPTER 23

Otorhinolaryngology

Questions

- 1.** Which dressing is used after nasal surgery?

 - (A) Collodian
 - (B) Moustache
 - (C) Pressure
 - (D) Telfa
- 2.** What combination of lasers are particularly useful in surgery of the larynx and vocal cords?

 - (A) CO₂ and argon
 - (B) CO₂ and helium–neon
 - (C) CO₂ and Nd:YAG
 - (D) Argon and helium–neon
- 3.** The most common topical anesthetic agent used in ENT surgery is

 - (A) Xylocaine
 - (B) procaine
 - (C) cocaine

(D) Surfacaine

4. Irrigation is used with the ear drill

(A) to remove bone fragments

(B) to minimize transfer of heat from burr to surrounding structures

(C) to add moisture

(D) to control bleeding

5. A surgical schedule would describe the procedure to treat acute otitis media as a

(A) myringotomy

(B) stapes mobilization

(C) fenestration operation

(D) Wullstein procedure

6. In myringotomy, the tube to facilitate drainage is placed into the tympanic membrane with a/n

(A) alligator forceps

(B) Castroviejo

(C) wire loop curette

(D) Tobey forceps

7. A perforated eardrum is corrected by

- (A) myringotomy
- (B) stapedectomy
- (C) stapedotomy
- (D) tympanoplasty

8. Severe vertigo may be relieved by

- (A) stapedectomy
- (B) myringotomy
- (C) labyrinthectomy
- (D) endolymphatic shunt

9. Middle ear ventilation is facilitated by

- (A) antrostomy
- (B) myringotomy
- (C) stapedectomy
- (D) turbinectomy

10. Cholesteatoma is treated by doing a

- (A) tympanoplasty
- (B) myringotomy
- (C) stapedectomy
- (D) mastoidectomy

11. A benign tumor arising from the eighth cranial nerve, which may grow to a size that produces neurologic

symptoms, is a/n

- (A) myoma
- (B) acoustic neuroma
- (C) teratoma
- (D) fibroma

12. Facial nerve trauma can be decreased by use of

- (A) computerized nerve monitor
- (B) fluoroscopy
- (C) Berman locator
- (D) Doppler

13. Another name for submucous resection is

- (A) septoplasty
- (B) rhinoplasty
- (C) antrostomy
- (D) trephination

14. Surgical correction of a deviated septum is known as
a/n

- (A) antrostomy
- (B) submucous resection
- (C) rhinoplasty
- (D) turbinectomy

15. A forceps used in nasal surgery is a/n

- (A) bayonet
- (B) Russian
- (C) rat-tooth
- (D) alligator

16. Which sinus is entered during an intranasal antrostomy (antral window)?

- (A) Ethmoid
- (B) Sphenoid
- (C) Maxillary
- (D) Frontal

17. Nasal polyps are removed with either a polyp forceps or a/n

- (A) antrum rasp
- (B) Coakley curette
- (C) Freer elevator
- (D) nasal snare

18. Which of the following medications would be used as a topical anesthetic before nasal surgery?

- (A) Numorphan
- (B) Codeine

- (C) Cocaine
- (D) Marcaine

19. Which surgery requires an incision under the upper lip above the teeth?

- (A) Caldwell–Luc
- (B) Submucous resection
- (C) Frontal sinus operation
- (D) Frontal sinus trephination

20. To establish a tracheostomy, a midline incision is created in the neck, below the

- (A) suprasternal notch
- (B) hyoid bone
- (C) cricoid cartilage
- (D) corniculate cartilage

21. Which medication is found on a tracheostomy setup to reduce the coughing reflex at tube insertion?

- (A) Cocaine 4%
- (B) Lidocaine 1%
- (C) Cocaine 10%
- (D) Lidocaine 10%

22. When a tracheostomy tube is inserted, the obturator is

quickly removed and the trachea is suctioned with a

- (A) catheter
- (B) Frazier
- (C) Poole
- (D) Yankauer

23. The majority of benign salivary gland tumors occur in which gland?

- (A) Sublingual
- (B) Submaxillary
- (C) Parotid
- (D) Submandibular

24. Which position is used following a tonsillectomy?

- (A) Dorsal recumbent
- (B) On side, horizontally
- (C) Reverse Trendelenburg
- (D) Supine

25. Total laryngectomy includes all of the following EXCEPT

- (A) soft palate
- (B) strap muscles
- (C) hyoid bone

(D) larynx

26. What mode would be utilized to maintain drainage postoperatively in radical neck surgery?

(A) Penrose drain

(B) Hemovac

(C) Sump drain

(D) T-tube

27. A trifurcate neck incision is done for a/n

(A) parotidectomy

(B) submaxillary gland excision

(C) uvulopalatopharyngoplasty

(D) radical neck dissection

28. During ear surgery, pledgets generally used to control bleeding are soaked in

(A) saline

(B) heparin

(C) thrombin

(D) epinephrine

29. In cochlear implantation, the receiver is placed into which bone of the skull to gather impulses and send it along to the cerebral cortex?

- (A) Parietal
- (B) Mastoid
- (C) Occipital
- (D) Frontal

30. Which of the following endotracheal tubes can prevent a fire

- (A) stainless steel
- (B) silicone
- (C) latex
- (D) red rubber

31. Lesion of the larynx and vocal cords can be addressed surgically using which laser?

- (A) Nd:Yag
- (B) Holmium
- (C) CO₂
- (D) Argon

32. Which degree endoscope is used ONLY in maxillary sinus surgery?

- (A) 30 degrees
- (B) 70 degrees
- (C) 90 degrees

(D) 120 degrees

33. What is the instrument used to effect removal of the septal cartilage in a rhinoplasty?

- (A) Knight nasal scissor
- (B) Joseph nasal scissor
- (C) Jansen–Middleton forceps
- (D) Freer septum knife

34. After the anterior pillar of a tonsil is incised with a #12 blade, the tonsil is freed from its attachments with a

- (A) Sluder guillotine
- (B) LaForce guillotine
- (C) Hurd dissector
- (D) Boettcher scissors

35. What is the most effective barrier to stop laser energy from penetrating healthy tissue?

- (A) Proper use of goggles
- (B) Covering reflective windows
- (C) Checking laser equipment after each use
- (D) Moist padding of surrounding tissue

36. A safer alternative laser retardant endotracheal tube

used for CO₂ laser surgery of the larynx is made of

- (A) copper
- (B) stainless steel
- (C) silicone
- (D) Both A and B

37. Plates and screws are the primary means of repairing facial fractures. What is the order of instrumentation used for this procedure?

(1) Power drill with drill bit, (2) placement of plate, (3) placement of screws, (4) depth gauge

- (A) 1, 2, 3, 4
- (B) 2, 3, 4, 1
- (C) 3, 4, 1, 2
- (D) 2, 1, 4, 3

38. Maxillomandibular fixation (MMF) is a procedure used to realign the teeth or to maintain the patients normal bite position. Which of the following is used during MMF?

- (A) Arch bars
- (B) Bicoronal plate
- (C) Bicortical screw
- (D) Plates and screws

39. If arch bars remain in the patient postoperatively, what must be kept with the patient at all times to access the airway in case of emergency?

- (A) Endotracheal tube
- (B) Naso endotracheal tube
- (C) Wirecutter
- (D) Tracheostomy tray

40. What type of facial fracture is associated with the leakage of cerebrospinal fluid into the nasal sinus?

- (A) LeFort I
- (B) LeFort II
- (C) LeFort III
- (D) LeFort IV

41. What is the facial bone that makes up the chin?

- (A) Frontal
- (B) Zygomatic
- (C) Maxilla
- (D) Mandible

42. Temporal mandibular joint (TMJ) arthroplasty is performed for all of these disorders EXCEPT

- (A) grinding of the teeth

- (B) trauma
- (C) wisdom teeth
- (D) arthritis

43. During a thyroidectomy, the surgeon identifies and preserves which of the following structure(s):

- (A) recurrent laryngeal
- (B) parathyroid glands
- (C) superior laryngeal
- (D) All of the above

44. What is the primary reason for performing a thyroplasty?

- (A) Facial nerve paralysis
- (B) Unilateral vocal cord paralysis
- (C) Goiter
- (D) Tumor in the lymph nodes

45. During a parotidectomy, what cranial nerve is carefully elevated and retracted in order to preserve it?

- (A) Vagus
- (B) Optic
- (C) Oculomotor
- (D) Facial

Answers and Explanations

- 1. (B)** A moustache dressing may be applied under the nose (nares) to absorb any bleeding (Meeker and Rothrock).
- 2. (B)** The CO₂ laser is efficient and has a high-power output. It uses a combination of CO₂, nitrogen, and helium. As energy levels subside, light beams are produced that form a single beam of light in the ultraviolet range that is invisible. For this reason, a red beam from a helium–neon laser is added so that it may be properly aimed at the affected tissue (Meeker and Rothrock).
- 3. (C)** Cocaine is unrivaled in its power to penetrate the mucous membrane to produce surface anesthesia. Onset is immediate. It also causes vasoconstriction to reduce bleeding. Administration is only topical because of its high toxicity (Fortunato).
- 4. (B)** The scrub cleans the burrs during the procedure. Continuous irrigation is necessary to minimize the transfer of heat from the burr to surrounding bone and structures. A suction irrigation may be used (Meeker

and Rothrock).

- 5. (A)** Incision of the tympanic membrane, known as myringotomy, is done to treat otitis media. By releasing the fluid behind the membrane, hearing is restored and infection controlled. Frequently, tubes are inserted through the tympanic membrane (Meeker and Rothrock).
- 6. (A)** An alligator forceps is used to insert the tube into the incision (Meeker and Rothrock).
- 7. (D)** Perforation of the eardrum (tympanic membrane) is the most common serious ear injury. Tympanoplasty using grafted tissue improves hearing and prevents recurrent infection (Meeker and Rothrock).
- 8. (C)** Labyrinthectomy is a procedure that destroys the membranous labyrinth to relieve the patient of severe vertigo when other means have been tried. The operation leaves the ear deaf (Meeker and Rothrock).
- 9. (B)** Myringotomy is incision into the tympanic membrane to ventilate the middle ear (Meeker and Rothrock).
- 10. (D)** Mastoidectomy is the removal of the diseased

bone of the mastoid, along with cholesteatoma that results from an accumulation of squamous epithelium and its products. This putty-like mass destroys the middle ear and mastoid, so diseased bone must be removed (Meeker and Rothrock).

- 11. (B)** An acoustic neuroma arises in the eighth cranial nerve (acoustic). These tumors are benign but may grow to a size that produces neurologic symptoms. The main patient complaint is hearing loss (Meeker and Rothrock).
- 12. (A)** Computerized facial nerve monitoring is used intraoperatively to decrease trauma during tumor dissection and to assess facial nerve status (Meeker and Rothrock).
- 13. (A)** Submucous resection is also known as septoplasty—removal of either cartilage or bone portions of the septum that obstruct the sinus opening and prevent a clear airway (Meeker and Rothrock).
- 14. (B)** A submucous resection is done for nasal septum deformity, fracture, or injury that has impaired normal respiratory function and has impaired drainage (Meeker and Rothrock).

- 15. (A)** A bayonet forceps is used to introduce sponges into the nose (Meeker and Rothrock).
- 16. (C)** This surgery is done to relieve edema or infection of the membrane lining the sinuses and resultant headaches. An opening is made into the maxillary sinus (Meeker and Rothrock).
- 17. (D)** Polyps are removed with a snare, polyp forceps, and suction (Meeker and Rothrock).
- 18. (C)** Frequently, a topical anesthetic is used before nasal surgery. The drug of choice is cocaine, 10% or 4%, and would be administered by means of soaked applicators introduced into the nasal cavity and absorbed by the mucous membrane (Meeker and Rothrock).
- 19. (A)** A Caldwell–Luc (radical antrostomy) entails an incision under the upper lip above the teeth. It is done to ensure drainage and aeration and permit, under direct vision, removal of diseased sinus tissue (Meeker and Rothrock).
- 20. (C)** Tracheostomy is the opening of the trachea and establishment of a new airway through a midline

incision in the neck, below the cricoid cartilage. A cannula is put in place to maintain the airway. This is an emergency procedure (Meeker and Rothrock).

- 21. (B)** Lidocaine 1% (1 or 2 mL) may be instilled into the trachea to reduce the coughing reflex when the tube is inserted (Meeker and Rothrock).
- 22. (A)** A catheter is used to suction the trachea at tube insertion (Meeker and Rothrock).
- 23. (C)** Most neoplasms of the salivary glands are benign mixed tumors; most of these affect the parotid gland (Meeker and Rothrock).
- 24. (B)** The patient is placed in the semirecum-bent (Fowler's) position or on one side, horizontally, to prevent aspiration of blood and venous engorgement postoperatively (Meeker and Rothrock).
- 25. (A)** Total laryngectomy is complete removal of the larynx, hyoid bone, and the strap muscles (Meeker and Rothrock).
- 26. (B)** To maintain hemostasis postoperatively in radical neck surgery, a Hemovac is generally employed.

Continuous pressure from the gauze pressure dressings reduces the accumulation of serosanguineous fluid, which is removed by the Hemovac (Meeker and Rothrock).

- 27. (D)** For radical neck, a Y-shaped or trifurcate incision is used in the affected side of the neck. A parotid incision is also a Y incision but on both sides of the ear and below the angle of the mandible (Meeker and Rothrock).
- 28. (D)** During ear surgery, a local anesthetic with epinephrine is often the surgeon's choice because the epinephrine acts as a vasoconstrictor and prevents oozing in the wound. Epinephrine-soaked pledgets are also used to control bleeding (Meeker and Rothrock).
- 29. (B)** The device is implanted in the cochlea, with the receiver resting in the mastoid bone. As the device receives sound through the receiver, it emits electrical impulses through the transmitter into the cochlea and along the acoustic nerve. These impulses are interpreted as a sound in the temporal cortex of the cerebrum (Meeker and Rothrock).
- 30. (A)** All choices except for A (stainless steel) can cause

fires if hit by a laser beam. To protect the patient, the endotracheal tube must be protected by wrapping it with adhesive sensitive tape. In addition, wet gauze is placed just above the cuff. Stainless steel, copper, and commercially prepared noncombustibles are better choices (Meeker and Rothrock).

31. (C) The advent of the CO₂ laser added a new dimension to the laryngologist's treatment of lesions of the larynx and vocal cords. The laser is efficient and has a high-power output. It uses a combination of CO₂, nitrogen, and helium gas (Meeker and Rothrock).

32. (D) The 120-degree endoscope is used only during maxillary sinus endoscopy. The 70-degree endoscope may occasionally be used in special maxillary procedure, but is a diagnostic scope generally (Meeker and Rothrock).

33. (C) During a rhinoplasty, the dorsal hump can be taken down with an osteotome. A cartilaginous hump can be removed by means of a cutting forcep, such as a Jansen–Middleton forcep (Meeker and Rothrock).

34. (C) During a tonsillectomy, the tonsil is grasped with

a tonsil-grasping forcep, the mucous membrane of the anterior pillar is incised with a knife, and the tonsil lobe is freed from its attachments to the pillar with a tonsil dissector (Meeker and Rothrock).

- 35. (D)** It is imperative that all gauze pads or patties be kept moistened during the surgery to prevent damage to healthy tissue from stray or reflected beams of light. Moisture is the most effective barrier to stop the laser energy from penetrating healthy tissue or igniting materials in the area (Meeker and Rothrock).
- 36. (D)** Because regulation endotracheal tubes are combustible, they must be carefully wrapped with adhesive sensing tape. A safer alternative is the use of copper (Carden), stainless steel (Porch), or commercially prepared laser-retardant endotracheal tubes on a jet ventilation system (Meeker and Rothrock).
- 37. (D)** The surgeon chooses the size and the type of plate, the appropriate drill bit is loaded onto the power drill, screw holes are drilled, depth gauge is used to determine the depth of the screw holes, correct screw is loaded onto a screw driver and screwed into place (Fuller).

- 38. (A)** Arch bars are a thin metal strap. It is wired to each row of teeth. The bars are then wired together with stainless steel suture performed to occlude the jaw (Fuller).
- 39. (C)** Wirecutters are kept with the patient at all times in case of airway emergency (Fuller).
- 40. (B)** LeFort II is associated with leakage of CSF into the nasal sinuses (Fuller).
- 41. (D)** The lower face is composed of the mandible (chin) (Fuller).
- 42. (C)** TMJ is characterized by persistent pain due to stress-related muscle tension, grinding of teeth, malocclusion, trauma and arthritis (Fuller).
- 43. (D)** As the surgeon dissects the thyroid gland from the surrounding tissues, the parathyroid glands, the superior laryngeal nerve, and the recurrent laryngeal nerves are identified and preserved (Fuller).
- 44. (B)** A thyroplasty is performed for a unilateral vocal cord paralysis due to surgical trauma of the laryngeal nerve or prolonged intubation (Fuller).

45. (D) If the deep lobe of the parotid must be excised, the facial nerve is elevated and retracted with vessel loops during a parotidectomy (Fuller).

CHAPTER 24

Plastic and Reconstructive Surgery

Questions

- 1.** A continuous suture placed beneath the epidermal layer of the skin in short lateral stitches is called a

 - (A) mattress suture
 - (B) transfixion suture
 - (C) retention suture
 - (D) subcuticular suture
- 2.** An item used for padding that has smooth and clingy layers is called

 - (A) Webril
 - (B) stockingette
 - (C) telfa
 - (D) gypsum
- 3.** A temporary biologic dressing is

 - (A) porcine
 - (B) telfa
 - (C) collagen
 - (D) mesh

4. Which of the following is NOT a reason for a pressure dressing?

- (A) Prevents edema
- (B) Conforms to body contour
- (C) Absorbs extensive drainage
- (D) Distributes pressure evenly

5. A dressing that is held in place by long suture ends crisscrossed and tied is called a

- (A) passive
- (B) strip closure
- (C) Proxi-Strip
- (D) stent

6. When local anesthetic is passed to the surgeon,

- (A) hand syringe with cap on
- (B) state kind and percentage of solution
- (C) state amount being handed
- (D) show surgeon the label

7. Which procedure is followed if the scrub is pricked with a needle?

- (A) Change glove only
- (B) Discard needle, change glove

- (C) Place new glove over old
- (D) Change gown and gloves

8. All of the following statements regarding the preparation for a skin graft are true EXCEPT

- (A) the dermatome is placed on the recipient table
- (B) the donor site is prepared with a colorless antiseptic agent
- (C) separate setups are necessary for skin preparation of recipient and donor sites
- (D) items used in preparation of the recipient site must not be permitted to contaminate the donor site

9. When using a sterile syringe, the scrub nurse should

- (A) always let the surgeon attach the needle
- (B) always use a Luer–Lok tip
- (C) never use a Luer–Slip (plain) tip
- (D) never touch the plunger except at the end

10. Which of the following is the LEAST desirable method for needle accountability?

- (A) Insert needle into original packet
- (B) Collect needles in a medicine cup
- (C) Place on an adhesive or magnetic board
- (D) Return to needle rack

11. Colorless prep solution may be indicated for

- (A) orthopedic surgery
- (B) vascular surgery
- (C) plastic surgery
- (D) urologic surgery

12. A graft containing epidermis and only a portion of the dermis is called a

- (A) split-thickness graft
- (B) full-thickness Wolfe graft
- (C) composite graft
- (D) full-thickness pinch graft

13. A progressive disease of the palmar fascia is termed

- (A) Dupuytren's contracture
- (B) tendinitis
- (C) carpal tunnel syndrome
- (D) synovitis

14. Microtia refers to

- (A) protrusion of the external ear
- (B) absence of the external ear
- (C) abnormally small ear
- (D) imperforate ear

15. Good contact between a skin graft and the recipient site is facilitated by use of a/n

- (A) stent dressing
- (B) Elastoplast
- (C) splint–Ace bandage dressing
- (D) biologic dressing

16. Syndactyly refers to

- (A) an extra digit
- (B) an absent digit
- (C) webbing of the digits
- (D) an ear protrusion

17. A penile defect in which the urethra ends on the ventral surface of the penile shaft or in the perineum is termed

- (A) epispadias
- (B) chordee
- (C) phimosis
- (D) hypospadias

18. A face lift is termed a

- (A) blepharoplasty
- (B) mentoplasty

- (C) rhytidectomy
- (D) lipectomy

19. The intraoperative use of bone allografts requires all of the following responses from the scrub team EXCEPT

- (A) culture before implant
- (B) wash with an antibiotic solution
- (C) completely thaw
- (D) Both A and B

20. Bulky dressings added to the intermediate layer of a three-layer dressing are used to

- (A) eliminate dead space
- (B) concentrate pressure in one area
- (C) immobilize a body part
- (D) Both A and C

21. All of the following rules cover handling of prosthetic devices during plastic surgery procedures EXCEPT

- (A) powder must be wiped from gloves before handling
- (B) prosthesis must be dried completely before implant
- (C) gloves must be used to prevent skin oils from

causing inflammatory response

(D) prosthesis must be placed on lint-free surface to sterilize

22. Adherent, occlusive dressings that are used when slight or no drainage is expected are transparent polyurethane film such as

(A) telfa

(B) Bioclusive

(C) Opsite

(D) Both B and C

23. A method of applying dressings to an unstable area, such as the face or neck, utilizing long sutures tied over the dressing for stability is known as

(A) pressure

(B) stent

(C) one-layer

(D) three-layer

24. Free jejunal tissue transfers are frequently successful as adjunct surgical revisions following

(A) laryngoesophagectomy

(B) esophagectomy

(C) ileectomy

(D) Both A and B

25. What is the most commonly used donor tendon for a free flexor tendon graft?

- (A) Palmaris longus
- (B) Plantaris tendon
- (C) Abductor pollicis longus
- (D) Both A and B

26. What bandage effects the process of exsanguination of a limb prior to the use of a tourniquet?

- (A) Kling
- (B) Elastoplast
- (C) Esmarch
- (D) Ace

27. Which muscle is utilized to effect a TRAM flap in breast reconstruction?

- (A) Latissimus dorsi
- (B) Transrectus abdominis
- (C) Pectoralis major
- (D) Pectoralis minor

28. The most widely used method of scar revision next to scar removal is

- (A) chemical peel
- (B) sanding
- (C) Z-plasty
- (D) planing

29. A scar that is hypertrophic and bulbous and usually does not reduce over time is

- (A) papilloma
- (B) keloid
- (C) eschar
- (D) nevis

30. Burned tissue that is nonelastic and may constrict underlying structures is

- (A) eschar
- (B) split thickness skin graft
- (C) keloid
- (D) None of the above

31. A graft derived from pig tissue

- (A) feline
- (B) bovine
- (C) porcine
- (D) allograft

- 32.** The skin provides which of the following vital functions:
- (A) protects underlying tissues and organs
 - (B) excretes organic waste and stores nutrients
 - (C) excretes water and dissipates heat as a means of thermoregulation
 - (D) All of the above
- 33.** The most common type of skin cancer is
- (A) basal cell
 - (B) melanoma
 - (C) squamous cell
 - (D) nevi
- 34.** A graft transferred from one individual to another is
- (A) hemograft
 - (B) porcine
 - (C) autograft
 - (D) allograft
- 35.** A graft made up of tissue taken from one species and grafted to another species is
- (A) homograft
 - (B) autograft

- (C) xenograft
- (D) allograft

36. Removal of nonviable tissue from a nonhealing or traumatic wound is known as

- (A) debridement
- (B) undermining
- (C) grafting
- (D) Mohs surgery

37. A mentoplasty involves augmentation of

- (A) chin
- (B) lips
- (C) ears
- (D) nose

38. Macromastia in males is referred to as

- (A) accessory
- (B) gynecomastia
- (C) small breasts
- (D) None of the above

39. A panniculectomy is also known as

- (A) abdominoplasty

- (B) Z-plasty
- (C) mammoplasty
- (D) otoplasty

40. In order to reduce friction between the skin and the blade of the dermatome, the site is prepped with

- (A) methylene blue
- (B) betatine
- (C) chloraprep
- (D) mineral oil

Answers and Explanations

- 1. (D)** A subcuticular suture is a continuous suture placed beneath the epithelial layer of the skin in short lateral stitches. It leaves a minimal scar (Meeker and Rothrock).
- 2. (A)** Webril is a soft, lint-free cotton bandage. The surface is smooth but not glazed, so that each layer clings to the preceding one and the padding lies smoothly in place (Fortunato).
- 3. (A)** Pigskin (porcine) is used as a temporary biologic dressing to cover large body surfaces denuded of skin (Fortunato).
- 4. (B)** A pressure dressing prevents edema, distributes pressure evenly, absorbs excessive drainage, gives extra wound support, and provides comfort to the patient postoperatively (Fortunato).
- 5. (D)** A stent dressing or fixation is a method of applying pressure and stabilizing tissues when it is impossible to dress an area. In the case of the nose, for example, long suture ends are crisscrossed over a

small dressing and tied (Fortunato).

- 6. (B)** After a syringe is filled and verification is established by the nurse and scrub, it is handed to the surgeon. The scrub states the kind and percentage of solution and keeps track of the amount used (Fortunato).
- 7. (B)** Change a glove at once and discard needle or instrument if a glove is pricked by a needle or snagged by an instrument (Fortunato).
- 8. (A)** Separate setups are used in skin preparation of the recipient and donor sites. Items used in preparation of the recipient site must not be permitted to contaminate the donor site. The donor site should be scrubbed with a colorless antiseptic agent so the surgeon can evaluate the vascularity of the graft postoperatively. Always place dermatome separately, never on recipient table (Fortunato).
- 9. (D)** The scrub nurse should not touch the plunger except at the end because glove powder can act as a contaminant. Contamination of the plunger can contaminate the inner wall of the barrel and the solution that is drawn into it (Fortunato).
- 10. (B)** Needles are not safely stored in a medicine cup

because of difficulty in counting them and the chance of puncturing the glove when removing them. Also by handling each needle individually, the potential for contamination increases (Fortunato).

- 11. (C)** A colorless prep solution may be used in plastic surgery to facilitate observation of the true color of the skin (Fortunato).
- 12. (A)** A split-thickness graft, or partial-thickness graft, contains epidermis and only a portion of the dermis (Meeker and Rothrock).
- 13. (A)** Dupuytren's contracture is a progressive disease involving the palmar fascia and the digital extensions of the palmar fascia. The surgery required is a palmar fasciectomy (Meeker and Rothrock).
- 14. (B)** Microtia refers to congenital total or subtotal absence of the external ear (Meeker and Rothrock).
- 15. (A)** A stent or tie-over dressing exerts even pressure, ensuring good contact between graft and recipient site (Meeker and Rothrock).
- 16. (C)** Syndactyly refers to webbing of the digits of the hand or foot (Meeker and Rothrock).
- 17. (D)** Hypospadias is a congenital anomaly in which the

urethra ends on the ventral penile shaft or in the perineum. It is frequently accompanied by chordee (a downward curvature of the penis) (Meeker and Rothrock).

18. (C) A rhytidectomy is a face lift designed to improve appearance by removing excess skin and sometimes excess fat of the neck (Meeker and Rothrock).

19. (C) Frozen allografts are stored in plastic or cloth wraps to ensure sterility and prevent grafts from drying out. When requested for a procedure, the allograft is delivered to the field slightly thawed. It is then cultured and washed with an antibiotic solution (Meeker and Rothrock).

20. (D) Pressure dressings are used mainly in general surgery or plastic procedures to eliminate dead space, absorb extensive drainage, distribute pressure evenly, and immobilize a body part when muscles are moved (Meeker and Rothrock).

21. (B) Breast prostheses and tissue expanders should be placed in a container with sterile saline or antibiotic solution on the sterile field (Meeker and Rothrock).

22. (D) Sterile, transparent occlusive dressings, such as Bioclusive and Opsite, are made of transparent

polyethylene and may be used when slight or no drainage is expected. They are usually removed after 24–48 hours (Fortunato).

- 23. (B)** Stent fixation is a method of applying pressure and stabilizing tissues when it is impossible to dress an area such as the face or neck (Fortunato).
- 24. (D)** Reconstructive problems in patients undergoing laryngectomy and upper cervical esophagectomy can be adequately solved by a free jejunal transfer. Modern microscopic techniques greatly improve the success rate (Meeker and Rothrock).
- 25. (D)** The most commonly used donor tendon for a free graft is the palmaris longus tendon of the wrist and forearm. The plantaris tendon in the leg is also frequently used (Meeker and Rothrock).
- 26. (C)** An Esmarch bandage is used to exsanguinate the extremity before institution of a pneumatic tourniquet (Meeker and Rothrock).
- 27. (B)** The TRAM flap is a single-stage reconstruction of a postmastectomy breast with the transverse rectus abdominis muscle of the lower abdomen (Meeker and Rothrock).

- 28. (C)** The simplest form of scar revision is excision of an existing scar and simple resuturing of the wound. The Z-plasty is the most widely used method of scar revision. It breaks up linear scars, rearranging them so that all tissue lies in the same direction (Meeker and Rothrock).
- 29. (B)** A keloid is a hypertrophic scar usually occurring in dark-skinned individuals and does not reduce over time (Fuller).
- 30. (A)** Eschar consists of tissue that has been burned but remains adherent to the wound. Eschar is nonelastic and may constrict underlying structures and impair vital functions (Fuller).
- 31. (C)** Porcine is derived from pig tissue (Fuller).
- 32. (D)** The skin or the integumentary system performs a number of vital functions as well as its sensory organs transmit touch, pressure, pain, and temperature which alert the body to personal injury (Fuller).
- 33. (A)** Basal cell carcinoma is the most slow-growing cancer and arises from the basal layer of the epidermis (Fuller).
- 34. (D)** A graft that is transferred from one individual to

another is known as an allograft or a homograft. They are harvested from donors and preserved by the tissue bank until needed (Fuller).

- 35. (C)** A graft made up of tissue taken from one species and grafted to another species is a xenograft (Fuller).
- 36. (A)** Removal of tissue and burn wounds require repeated debridement to remove dying and dead tissue so that healing can continue (Fuller).
- 37. (A)** Another name for a mentoplasty is a chin augmentation (Fuller).
- 38. (B)** Macromastia in males is referred to as gynecomastia (Fuller).
- 39. (A)** Abdominoplasty or a panniculectomy is removal of excess skin and adipose tissue from the abdominal wall (Fuller).
- 40. (D)** Mineral oil is applied to the donor graft site to reduce friction prior to using the dermatome (Fuller).

CHAPTER 25

Genitourinary Surgery

Questions

1. The Pereyra needle is used in which specialty area of surgery?

- (A) Neurology
- (B) Urology
- (C) Orthopedics
- (D) Ophthalmology

2. The use of distilled water during a highly invasive genitourinary procedure such as a transurethral resection of the prostate (TURP) is prohibited for irrigation because of the potential for

- (A) hemolysis of RBC
- (B) electrolytic dissipation of current
- (C) increase of blood pressure
- (D) body fluid shift

3. Why is a 30-cc bag Foley used after a TURP?

- (A) Hemostasis
- (B) Decompression

- (C) Creation of negative pressure
- (D) Aspiration

4. The three lumens of a Foley are used for inflation, drainage, and

- (A) prevention of urine reflux
- (B) access for sterile urine specimens
- (C) continuous irrigation
- (D) additional hemostasis

5. The purpose of the kidney bar or kidney lift is to

- (A) increase the space between the lower ribs and iliac crest
- (B) increase the space between the ribs
- (C) stabilize the patient
- (D) support the body in the flexed position

6. Why is the table straightened before closing a kidney incision?

- (A) To facilitate easier respirations
- (B) To create better approximation of tissues
- (C) To facilitate better circulation
- (D) To prevent nerve damage

7. Nonmalignant enlargement of the prostate is termed

- (A) prostatitis
- (B) benign prostatic hypertrophy (BPH)
- (C) balanitis
- (D) prostatism

8. Urethral strictures can be dilated by use of each of the following EXCEPT

- (A) Philips filiform and followers
- (B) VanBuren sounds
- (C) Braasch bulb
- (D) McCarthy dilators

9. A staghorn stone is one that lodges and continues to grow in the

- (A) renal calyx
- (B) space of Retzius
- (C) ureter
- (D) hilum

10. In cystoscopy, the irrigating solution is

- (A) distilled water
- (B) glycine
- (C) mannitol
- (D) sorbitol

11. Rib removal for surgical exposure of the kidney requires all of the following EXCEPT a/n

- (A) Alexander periosteotome
- (B) Doyen raspatory
- (C) Heaney clamp
- (D) Stille shears

12. Penile condylomata are most successfully removed by

- (A) dermabrasion
- (B) laser
- (C) cautery
- (D) ultrasound

13. Removal of a testis or the testes is called

- (A) orchiopexy
- (B) orchiectomy
- (C) epididymectomy
- (D) vasectomy

14. Which solution is NOT used during a transurethral prostatectomy?

- (A) normal saline
- (B) sorbitol
- (C) mannitol

(D) glycine

15. Temporary diversion of urinary drainage by means of an external catheter that drains the renal pelvis is called

(A) vesicostomy

(B) nephrostomy

(C) pyelostomy

(D) cystostomy

16. The procedure to treat organic sexual impotence is

(A) spermatocelectomy

(B) varicocelectomy

(C) testicular implant

(D) penile implant

17. Microscopic reversal of the male sterilization procedure is termed

(A) spermatogenesis

(B) orchiopexy

(C) vasovasostomy

(D) vasectomy

18. A needle biopsy of the prostate may be accomplished with a/n

- (A) butterfly needle
- (B) angiocatheter
- (C) Tru-cut needle
- (D) taper needle

19. When the male penis is curved ventrally with the meatus and the glans in close proximity to each other it is called

- (A) paraphimosis
- (B) phimosis
- (C) epispadias
- (D) chordee

20. Continuous irrigation following TURP is accomplished by use of a

- (A) suprapubic cystotomy tube
- (B) 30-cc three-way Foley catheter
- (C) 5-cc three-way Foley catheter
- (D) 30-cc two-way Foley catheter

21. When the prostate gland is removed through an abdominal incision into the anterior prostatic capsule, it is called a prostatectomy.

- (A) perineal

- (B) suprapubic
- (C) retropubic
- (D) transurethral

22. Kidney stones are sent to the laboratory in

- (A) saline
- (B) water
- (C) dry state
- (D) formalin

23. A Pereyra procedure is done for

- (A) stress incontinence
- (B) chronic bladder infection
- (C) drainage of the bladder
- (D) impotence

24. A percutaneous nephrolithotomy utilizes all of the following EXCEPT

- (A) ultrasound wand
- (B) flexible nephroscope
- (C) lithotripter
- (D) lithotripter tub

25. Orchiopexy can be defined as

- (A) fixation of an ovary
- (B) uterine suspension
- (C) testicle removal
- (D) fixation of a testicle

26. Abdominal resection of the prostate gland through an incision into the bladder is known surgically as a

- (A) retropubic prostatectomy
- (B) suprapubic prostatectomy
- (C) transurethral prostatectomy
- (D) suprapubic cystostomy

27. A lumbar or simple flank incision for ureter or kidney surgery may include removal of which ribs?

- (A) 5 and 6
- (B) 7 and 8
- (C) 9 and 10
- (D) 11 and 12

28. An abnormal accumulation of fluid in the scrotum is a/n

- (A) hydrocele
- (B) enterocele
- (C) varicocele
- (D) hydronephrosis

29. Bladder stones are crushed with a

- (A) basket catheter
- (B) lithotrite
- (C) cautery
- (D) resectoscope

30. Urethral meatal stenosis is corrected by a/n

- (A) frenulotomy
- (B) meatotomy
- (C) urethral dilation
- (D) extirpation of the penis

31. In a penile implant, the inflation pump is located in the

- (A) distal penis
- (B) proximal penis
- (C) scrotum
- (D) groin

32. Excision of the tunica vaginalis is a

- (A) vagotomy
- (B) vasectomy
- (C) varicocelectomy
- (D) hydrocelectomy

33. Circumcision refers to

- (A) removal of the foreskin
- (B) removal of the glans
- (C) widening of the urethral opening
- (D) lengthening of the foreskin

34. An alternative approach to surgical TURP utilizing a cystoscopic setup as its base is

- (A) suprapubic prostatectomy
- (B) transcystoscopic urethroplasty
- (C) perineal prostatectomy
- (D) retropubic prostatectomy

35. The laser used to destroy small recurrent bladder tumors is the

- (A) CO₂
- (B) argon
- (C) Nd:YAG
- (D) Both A and B

36. Following anastomosis of a ureter during a ureteral reimplantation procedure, a is left in place to ensure free drainage of the kidney postoperatively.

- (A) Foley catheter

- (B) ureteral catheter
- (C) T-tube
- (D) soft stent

37. A reverse sterilization procedure in the male is called a/n

- (A) vasostomy
- (B) vasovasostomy
- (C) epididymovasostomy
- (D) Both B and C

38. Before insertion of a penile implant, the insertion site, as well as the implant itself, is irrigated with

- (A) normal saline
- (B) Betadine
- (C) sterile water
- (D) Kanamycin and Bacitracin

39. To prevent thrombi from forming in the walls of the renal vein during transfer from the donor to the recipient, _____ is given just before clamping of the renal vessels.

- (A) furosemide
- (B) protamine sulfate
- (C) heparin

(D) mannitol

40. The drug of choice for adequate diuresis of a living donor before, during, and postremoval of the kidney is

(A) urea

(B) protamine sulfate

(C) Ringer's lactate solution

(D) mannitol

41. All of the following are ideal requirements of cadaver donors EXCEPT

(A) any age

(B) free of infection or malignancy

(C) normotensive up until death

(D) under hospital observation before death

42. Cooling and flushing of pancreas, liver, and kidneys of cadaver donors is accomplished by cannulation of the organ and infusion of large amounts of cold

(A) saline solution

(B) Ringer's lactate solution

(C) sterile water

(D) Sack's solution

43. Nonconducting, isosmotic glycine irrigating solution

must be used in the surgical presence of a

- (A) cystoscope
- (B) ureteroscope
- (C) resectoscope
- (D) nephroscope

44. All of the following procedures may be completed through a cystoscope EXCEPT

- (A) biopsy of bladder tumor
- (B) removal of foreign body in bladder
- (C) total removal of bladder tumor
- (D) cystogram for diagnostic studies

45. After incision is made into the scrotum during a vasectomy, the forceps used to grasp the vas and bring it to the surface for surgery is the

- (A) Allis
- (B) Babcock
- (C) Kelly
- (D) mosquito

46. Extracorporeal shock wave lithotripsy (ESWL) disintegrates stones by introducing shock waves into the body through the medium of

- (A) water
- (B) air
- (C) gas
- (D) saline

47. Laser lithotripsy utilizes the tunable pulse-dyed laser known as

- (A) diode
- (B) Nd:YAG
- (C) Candela
- (D) argon

48. The inability to control urination is

- (A) reflux
- (B) urinary incontinence
- (C) hydrocele
- (D) vchronic bladder infection

49. The radiographic diagnostic test used to outline the structures of the kidney ureters and bladder is known as

- (A) MRI
- (B) retrograde pyelogram
- (C) GU radiograph
- (D) KUB

50. Overabsorbtion of irrigation fluid that may result in vascular overload is known as

- (A) extravasation
- (B) intravasation
- (C) hemolysis
- (D) hydronephrosis

51. All are urethral catheters EXCEPT

- (A) Whistle tip
- (B) Spiral tip
- (C) Braasch bulb
- (D) three-way Foley

52. When performing an ileal conduit for urinary diversion, the ureters are implanted into

- (A) bladder
- (B) ileum
- (C) trigone
- (D) large intestine

53. If a patient is undergoing a right nephrectomy for a right renal tumor, the position is

- (A) a right lateral kidney
- (B) a left lateral kidney

- (C) supine
- (D) prone

54. What syringe is used to evacuate bladder, prostate or Stone fragments?

- (A) Cystoscope
- (B) Elllik
- (C) Toomey
- (D) Both B and C

55. Which of the following dilators are used to dilate the urethra?

- (A) Hanks
- (B) Hagar
- (C) Cysto
- (D) Van Buren

56. Which incision is used when doing a TURP?

- (A) Suprapubic
- (B) Retropubic
- (C) Pfannenstiel
- (D) None of the above

57. Insertion of a suprapubic catheter into the bladder for drainage away from the vaginal and urethral area is

- (A) Foley catheter
- (B) ileal conduit
- (C) cystostomy
- (D) Stamey procedure

58. Discharge of urine from the urinary bladder is called

- (A) plasma flow
- (B) albumen urea
- (C) renal clearance
- (D) micturation

59. The condition in which the urethral meatus is located on the top side of the penis?

- (A) Penile implant
- (B) Hypospadias
- (C) Epispadias
- (D) Meatotomy

60. Which of the following incisions are used in a kidney transplant for the donor patient and the recipient patient?

- (A) Subcostal flank, right lower quadrant
- (B) Right lower quadrant, subcostal flank
- (C) Right lower quadrant, right lower quadrant

(D) Subcostal flank, subcostal flank

61. This procedure is performed on a patient with chronic and end stage renal disease to aid in filtering the blood and removing ingested toxins.

(A) AV fistula

(B) AV shunt

(C) Peritoneal dialysis

(D) All of the above

Answers and Explanations

- 1. (B)** A Pereyra needle suspension is used to treat stress incontinence, a urinary condition (Fortunato).
- 2. (A)** When water is used for irrigation on an invasive surgical procedure, the pressure of the water against the exposed vessels creates a hemolytic reaction and therefore destroys red blood cells (Meeker and Rothrock).
- 3. (A)** Pressure from a 30-cc catheter balloon inserted after closure of the urethra helps obtain hemostasis by controlling venous bleeding (Meeker and Rothrock).
- 4. (C)** The third lumen provides a means for continuous irrigation of the bladder for a time postoperatively to prevent formation of clots in the bladder (Meeker and Rothrock).
- 5. (A)** The OR table is flexed so that the kidney elevator can be raised the desired amount to increase the space between lower ribs and iliac crest. (Fortunato).
- 6. (B)** When the kidney position is being used, the table

is straightened before closure to afford better approximation of tissues. It is used for procedures on kidneys and ureters. This is done by the anesthesiologist (Fortunato).

- 7. (B)** As the male ages, the prostate gland may enlarge and gradually obstruct the urethra. This condition is known as benign prostatic hypertrophy (BPH) (Meeker and Rothrock).
- 8. (C)** A Braasch bulb is a ureteral catheter used to occlude the ureteral orifice during X-ray study. Urethral dilatation is accomplished using McCarthy dilators, Philips filiform and followers, and Van Buren sounds (Meeker and Rothrock).
- 9. (A)** A stone may lodge in a renal calyx and continue to enlarge, eventually filling the entire renal collecting system. It is known as a staghorn stone (Meeker and Rothrock).
- 10. (A)** For simple observation cystoscopy or retrograde pyelogram, sterile distilled water may be used (Meeker and Rothrock).
- 11. (C)** The Alexander periosteotome, Doyen raspatory, and Stille shears are all instruments required to remove a rib. A Heaney clamp is a hemostatic clamp

used in gynecologic surgery (Meeker and Rothrock).

- 12. (B)** Laser ablation of condylomata is the eradication of diseased tissue by means of a laser beam. The recurrence rate with this technique is low (Meeker and Rothrock).
- 13. (B)** Removal of the testes (orchietomy) renders the patient both sterile and hormone deficient. Bilateral orchietomy usually denotes carcinoma. Unilateral orchietomy may be indicated for cancer, infection, or trauma (Meeker and Rothrock).
- 14. (A)** Sorbitol, mannitol, and glycine do not produce hemolysis. They are nonelectrolytic and do not cause dispersion of high-frequency current with loss of cutting power as occurs with normal saline (Meeker and Rothrock).
- 15. (C)** The pelvis of the kidney is incised with a small blade. A catheter is placed through the incision into the renal pelvis to create a short-term urinary diversion (Meeker and Rothrock).
- 16. (D)** A penile prosthesis is implanted for treatment of organic sexual impotence (Meeker and Rothrock).
- 17. (C)** Vasovasostomy is the surgical reanastomosis of

the vas deferens, utilizing the operative microscope (Meeker and Rothrock).

- 18. (C)** The Tru-cut or Vim–Silverman biopsy needle is used to retrieve a prostate biopsy (Meeker and Rothrock).
- 19. (D)** Kidney transplant entails transplantation of a living related or cadaver donor kidney into the recipient's iliac fossa (Meeker and Rothrock).
- 20. (B)** Following a TURP, the urologist may insert a 30-cc three-way Foley catheter. The third lumen provides a means of continuous irrigation of the bladder for a period after surgery to prevent the formation of clots. The large balloon aids in hemostasis (Meeker and Rothrock).
- 21. (C)** Retropubic prostatectomy is the enucleation of hypertrophied prostate tissue through an incision into the anterior prostatic capsule. Good exposure and excellent hemostasis are obtained (Meeker and Rothrock).
- 22. (C)** Stones removed during surgery are subjected to chemical analysis and thus are submitted in a dry state. Fixative agents invalidate the results of the analysis (Meeker and Rothrock).

- 23. (A)** A Pereyra procedure is a bladder neck suspension involving urethrovesical suspension with vaginourethroplasty (Meeker and Rothrock).
- 24. (D)** A percutaneous nephrolithotomy facilitates the removal of stones using a rigid or flexible nephroscope. Accessory instrumentation includes an ultrasonic wand (sonotrode), lithotripter probe, stone basket, and stone grasper. A lithotripter tub is used in extra-corporeal shock wave lithotripsy (Meeker and Rothrock).
- 25. (D)** Orchiopexy is regarded as the transfer or fixation of an imperfectly descended testicle into the scrotum and suturing it in place (Meeker and Rothrock).
- 26. (B)** After a suprapubic incision is made abdominally, an opening is made into the bladder, and the prostate is removed from above (Meeker and Rothrock).
- 27. (D)** The lumbar or simple flank incision may include removal of the 11th or 12th rib, thus a rib set should be available (Meeker and Rothrock).
- 28. (A)** A hydrocele is an abnormal accumulation of fluid within the scrotum, contained in the tunica vaginalis (Meeker and Rothrock).

- 29. (B)** A lithotrite is used to crush large bladder calculi (Meeker and Rothrock).
- 30. (B)** Urethral meatotomy is an incisional enlargement of the external urethral meatus to relieve stenosis or stricture either congenital or acquired (Meeker and Rothrock).
- 31. (C)** The pump is placed in the most dependent portion of the scrotum (Meeker and Rothrock).
- 32. (D)** A hydrocelectomy is the excision of the tunica vaginalis of the testis to remove the enlarged fluid-filled sac (Meeker and Rothrock).
- 33. (A)** Surgical removal of the foreskin of the penis is frequently performed immediately after birth. At times, the condition known as phimosis (stricture of the foreskin) that causes a circumcision to be done on an adult male who was not circumcised at birth (Meeker and Rothrock).
- 34. (B)** Balloon dilatation of the prosthetic urethra, also known as transcystoscopic urethroplasty, is an advanced alternative to transurethral prostatectomy. It is nonsurgical, and with a cystoscopic setup and balloon dilatation catheters, the urethra is stretched for a better urinary flow (Meeker and Rothrock).

- 35. (C)** The advantages of the Nd:YAG laser in the eradication of bladder tumors are that bleeding is minimized, only sedation is required, operating time is short, and there is minimal damage to healthy tissue (Meeker and Rothrock).
- 36. (D)** The proximal stoma is transferred to the site of the anastomosis for reimplantation. Following anastomosis with fine atraumatic sutures, a stent is left in place until healing occurs (Meeker and Rothrock).
- 37. (D)** Both vasovasostomy and epididymovasostomy are microscopic reanastomosis options for sterilization reversal in the male. Success rates vary from 40% to 70% (Meeker and Rothrock).
- 38. (D)** A serious complication to a penile implant is infection. Meticulous aseptic technique and careful draping are essential. Intraoperatively, and before insertion of the implant components, a prophylactic antibiotic irrigant of Bacitracin is used on the implants and in the insertion sites (Meeker and Rothrock).
- 39. (C)** Heparin is given IV to the donor just before clamping the renal vessels before removal of the kidney. Immediately after the kidney is removed (and only in a live donor), 50 mg of Protamine sulfate is given to reverse the action of the heparin in the donor

(Meeker and Rothrock).

- 40. (D)** Forty-five minutes before surgery, 12.5 g of mannitol is given to the kidney donor to ensure diuresis during anesthesia induction. The dose is repeated 5 minutes before the renal vessel is clamped to maximize diuresis and once again at the end of the procedure (Meeker and Rothrock).
- 41. (A)** The ideal cadaver donor should be young, free of infection or cancer, and normotensive until just before death. There must also be family permission, and the medical examiner must unequivocally establish brain death (Meeker and Rothrock).
- 42. (B)** Just before completion of full dissection of the donor liver, the donor is heparinized and systemically cooled. Further cooling and flushing of the pancreas, liver, and kidneys is achieved by cannulation and infusion of cold Ringer's lactate solution via the inferior vena cava until properly cooled (Meeker and Rothrock).
- 43. (C)** The use of the resectoscope requires that irrigation be accomplished with a nonconducting, isosmotic solution to prevent conduction of current into the bladder, as well as to prevent hemolysis attributable to electroresection of tissue (Fortunato).

- 44. (C)** All of the following procedures can be accomplished through a cystoscope: bladder biopsy, removal of a foreign body, insertion of radionuclide seeds, coagulation of a hemangioma with argon laser, and cystographic studies. Excision of a bladder tumor requires the use of a resectoscope (Fortunato).
- 45. (A)** The vas is located by digital palpation of the upper part of the scrotum. A small incision is made over the vas. An Allis forceps is inserted into the scrotal incision to grasp the vas (Meeker and Rothrock).
- 46. (A)** A noninvasive approach to urolithiasis management is the use of ESWL. This device disintegrates stones by introducing shock waves into the body, utilizing a specially treated water as a medium (Meeker and Rothrock).
- 47. (C)** The Candela laser, a tunable dye laser, allows the operator to dial the desired wavelength within a limited range. It has the ability to disintegrate stones without damaging surrounding tissue. The technique may be used during a ureteropyeloscopy or nephroscopy (Meeker and Rothrock).
- 48. (B)** Urinary incontinence is the inability to control urination most commonly caused by loss of sphincter control at the bladder neck (Fuller).

- 49. (D)** KUB is a radiograph of the kidneys, ureters, and bladder (Fuller).
- 50. (A)** Extravasation is the absorption of irrigation fluids into the vascular system which results in fluid overload and can result in cardiac arrest (Fuller).
- 51. (D)** A three-way Foley is used for irrigation and hemostasis (Fuller).
- 52. (B)** An ileal conduit is urinary diversion away from the bladder before or after a radical cystectomy, in which the bladder and surrounding tissue have been removed as a treatment for cancer (Fuller).
- 53. (B)** The patient is placed in a lateral with the flank over the table break with the operative side up (Fuller).
- 54. (D)** Small pieces of tissue or stones are released into the irrigation fluid in the bladder and evacuated with the ellick evacuator or toomey syringe (Fuller).
- 55. (D)** The Van Buren are the dilators commonly used to dilate the urethra (Fuller).
- 56. (D)** A TURP is done transurethrally with a resectoscope and therefore, no incision is required (Fuller).

- 57. (C)** Cystostomy is an opening made into the urinary bladder through a low abdominal incision with insertion of a suprapubic catheter (Fuller).
- 58. (D)** Micturation refers to urination (Fuller).
- 59. (C)** Epispadias is a rare condition in which the urethral meatus is located on the top side of the penis (Fuller).
- 60. (A)** The donor patient is placed in the lateral position with the flank over the kidney. A left subcostal incision is made. The recipient is prepped for a right iliac incision (Fuller).
- 61. (D)** AV shunt and AV fistula are used to access the vascular system for hemodialysis. During peritoneal dialysis, a silastic tube is implanted in the supra pubic peritoneal space (Tenkoff; Fuller).

CHAPTER 26

Thoracic Surgery

Questions

- 1.** The tube that collects bronchial washings is

 - (A) Broyles
 - (B) Lukens
 - (C) Ellik
 - (D) Toomey
- 2.** What instrument is used to view lymph nodes or masses in the space that medially separates the pleural cavities?

 - (A) Bronchoscope
 - (B) Mediastinoscope
 - (C) Endoscope
 - (D) Colonoscope
- 3.** The procedure of choice for removal of a foreign body in a child's tracheobronchial tree is

 - (A) bronchoscopy
 - (B) mediastinoscopy
 - (C) fluoroscopy

(D) telemetry

4. A cytologic specimen collector used in bronchoscopy is

(A) Ellik

(B) Toomey

(C) Jackson

(D) Lukens

5. All of the following are true regarding disposable chest drainage units EXCEPT

(A) provides drainage collection from intrapleural space

(B) maintains a seal to prevent air from entering the pleural cavity

(C) provides suction control determined by water level

(D) aids in reestablishing positive pressure in the intrapleural space

6. Compression of the subclavian vessels and the brachial plexis usually caused by the first rib is surgically known as

(A) cervical sympathectomy

(B) thoracic outlet syndrome

- (C) thoracic sympathectomy
- (D) decortication

7. A reduction of negative pressure on one side of the thoracic cavity that causes the negative pressure on the normal side to pull in an effort to equalize pressure is called

- (A) vital capacity
- (B) mediastinal shift
- (C) subatmospheric pressure
- (D) pneumothorax

8. Surgical removal of fibrinous deposits on the visceral and parietal pleura is called

- (A) posteriolateral thoracoplasty
- (B) talc poudrage
- (C) decortication of the lung
- (D) anterior thoracoplasty

9. What substance is introduced through a thoracoscope to deal with recurrent pleural effusion attributable to advanced cancer?

- (A) Chemotherapeutics
- (B) Talc
- (C) Tetracycline

(D) Hemostatic agents

10. What instrument is used to reapproximate the ribs following an open thoracotomy?

- (A) Doyen
- (B) Bailey
- (C) Alexander
- (D) Bethune

11. What cold solution is used to preserve a donor lung before transplant into a recipient?

- (A) Ringer's lactate
- (B) Saline
- (C) Collin's
- (D) Physiosol

12. How many anastomoses must be completed to effect a single-lung transplant?

- (A) One
- (B) Two
- (C) Three
- (D) Four

13. What is the preferred solution used for bronchial washings?

- (A) Sterile water
- (B) Sterile saline
- (C) Heparanized saline
- (D) Ringers lactate

14. During the mechanical process of breathing the diaphragm contracts _____ and relaxes during _____.

- (A) inhalation, exhalation
- (B) exhalation, inhalation
- (C) compression, expansion
- (D) normal respiration, maximum respiration

15. Biopsy of this node is performed before a thorocotomy to stage cancer staging or to confirm a diagnosis:

- (A) axillary
- (B) mediastinal
- (C) iliac
- (D) scalene

16. The most important laboratory test done to measure pulmonary function is

- (A) CBC (complete blood count)
- (B) ABGs (arterial blood gases)
- (C) hemaglobin and hematocrit

(D) WBC (white blood count)

17. Which of the pulmonary function tests measures the amount of air exhaled during normal respiration?

(A) Forced vital capacity

(B) Total lung capacity

(C) Vital capacity

(D) Tidal volume

18. All of the following are TRUE regarding the rigid bronchoscope EXCEPT

(A) used for procedures which require a large bore endoscope

(B) used for removal of a tissue mass and foreign bodies

(C) patients who have difficulty hyperextending the neck and difficult jaw manipulation

(D) complications include injury to the tracheal bronchial structures if patient moves

19. A thymectomy is commonly performed for malignant tumors and

(A) myasthenia gravis

(B) graves disease

(C) muscular dystrophy

(D) pneumothorax

20. What nerves are carefully preserved during a pneumonectomy?

- (A) Vagus, left recurrent laryngeal, and phrenic
- (B) Vagus, pneumatic, and phrenic
- (C) Vagus, pneumatic, and epigastric
- (D) Phrenic, right recurrent laryngeal, and vagus

21. When performing a thorocotomy, the wound edges are covered to protect them from bruising with what?

- (A) Nothing is used, to prevent loosing something
- (B) Moist lap pads or towels
- (C) To and fros
- (D) 4 × 4s

22. The lung is divided into anatomical regions. The right lung has _____ lobes and the left lung has _____ lobes.

- (A) two and two
- (B) three and two
- (C) three and three
- (D) two and three

23. In which surgery would a closed drainage system be

used?

- (A) Thoroscopic lung biopsy
- (B) Open thorotomy
- (C) Lung volume reduction surgery
- (D) All of the above

24. Bleeding arising from the respiratory tract is called

- (A) Empyema
- (B) Pleural effusion
- (C) Hemoptysis
- (D) Blebs

25. Positioning for a single lung transplant, the donor patient is _____ and the recipient patient is _____.

- (A) supine, lateral
- (B) supine, supine
- (C) lateral, lateral
- (D) lateral, supine

Answers and Explanations

- 1. (B)** Suction tubing with a Lukens tube collects washing specimens during a bronchoscopy (Meeker and Rothrock).
- 2. (B)** The mediastinoscope is used to view the lymph nodes or masses in the superior mediastinum (Meeker and Rothrock).
- 3. (A)** A rigid bronchoscope is the instrument of choice for removal of foreign bodies in infants and children (Meeker and Rothrock).
- 4. (D)** A Lukens or a Clerf is used to hold secretions as they are sucked through the aspirating tube. They collect in this device permitting retrieval for cytologic study (Meeker and Rothrock).
- 5. (D)** Disposable chest drainage collects drainage, maintains a water seal, and provides suction control. It is aimed at providing a conduit for air, blood, and other fluids as well as the reestablishment of negative pressure in the intrapleural space (Meeker and Rothrock).

- 6. (B)** Decompression for thoracic outlet syndrome is done to correct either a congenital deformity or traumatic injury resulting in anatomical changes in the skeletal structure of the first rib (Meeker and Rothrock).
- 7. (B)** A reduction of negative pressure on one side causes the negative pressure on the normal side to pull on the mediastinum in an effort to equalize the pressure. This is referred to as mediastinal shift; it tends to compress the lung, causing dyspnea (Meeker and Rothrock).
- 8. (C)** Removal of the fibrinous deposit or restrictive membrane on the visceral and parietal pleura that interferes with pulmonary function is called decortication of the lung (Meeker and Rothrock).
- 9. (B)** Pleural effusions are a significant cause of morbidity, particularly in patients with advanced cancer. Pleurodesis with the instillation of talc can be accomplished through the thoraco-scope for this purpose (Meeker and Rothrock).
- 10. (B)** All instruments are used to effect an open thoracotomy. A Doyen is a rib elevator, an Alexander is a rib raspator, a Bethune is a rib shear, and a Bailey is a rib approximator (Meeker and Rothrock).

- 11. (C)** After harvesting of the lung is complete, the trachea is stapled shut, and the donor lung is placed in cold Collin's solution (Meeker and Rothrock).
- 12. (C)** Three anastomoses are completed for a single-lung transplant: bronchus to bronchus, pulmonary artery to pulmonary artery, and recipient pulmonary veins to donor atrial cuff (Meeker and Rothrock).
- 13. (B)** Sterile saline is the solution used for bronchial washings (Fuller).
- 14. (A)** Breathing is a complex physiological and mechanical process controlled by the autonomic nervous system also under voluntary control. During inhalation, the diaphragm contracts and relaxes during exhalation (Fuller).
- 15. (D)** Lung cancer spreads through the intrathoracic and mediastinal lymphatics to the supraclavicular nodes, which are the last nodes in the drainage chain. The scalene fat pad is biopsied in conjunction with a thorocotomy to diagnose and stage malignant and nonmalignant thoracic disease (Fuller).
- 16. (B)** With ABGs the blood is assessed for oxygen, carbon dioxide and PH acid base balance. This is the most important for pulmonary function (Fuller).

- 17. (D)** PFTs are a group of procedures performed with a complex breathing machine that measure lung function. Tidal volume test measures the amount of air exhaled during normal respiration (Fuller).
- 18. (C)** The flexible bronchoscope is preferred over the rigid bronchoscope for patients who have difficulty hyperextending their neck or jaw manipulation is difficult or impossible (Fuller).
- 19. (A)** Myasthenia gravis is a neuromuscular that involves the muscles and nerves that control them. Removal of the thymus gland may result in permanent remission, and lessens the need for medication (Mosby).
- 20. (A)** The vagus, left recurrent laryngeal, and phrenic nerves are retracted with vessel loops or moist umbilical tape to protect them (Fuller).
- 21. (B)** When performing a thorocotomy, the edges of the wound are covered with lap pads or towels to prevent bruising (Fuller).
- 22. (B)** The right lung has three lobes and the left lung has two lobes (Fuller).
- 23. (D)** After spontaneous or traumatic air leak or surgery is performed in which the pleural cavities are opened,

negative air pressure must be restored in order for the lungs to expand. Chest tubes and a closed chest drainage system are used (Fuller).

- 24. (C)** Hemoptysis is one of many pathological indications for a bronchoscopy. It is bleeding arising from the respiratory tract (Alexanders, 14th ed.).
- 25. (A)** The donor patient is placed in supine because this allows the best exposure of organs to be excised and the recipient patient is placed laterally with the operative side up (Fuller).

CHAPTER 27

Cardiovascular and Peripheral Vascular Surgery

Questions

- 1.** In which procedure could a Fogarty catheter be utilized?
 - (A) Embolectomy
 - (B) Gastrectomy
 - (C) Craniotomy
 - (D) Thorocotomy

- 2.** Amputated extremities are
 - (A) sent to the pathology laboratory as are other specimens
 - (B) preserved in formaldehyde
 - (C) wrapped and refrigerated in the morgue
 - (D) placed in a dry container

- 3.** The action to be followed if a patient is experiencing a cardiac arrhythmia, specifically a ventricular fibrillation, would be to

- (A) start an IV
- (B) defibrillate
- (C) order blood to replace blood volume
- (D) administer intravenous lidocaine

4. Dextran is used parenterally to

- (A) expand blood plasma volume
- (B) renourish vital tissue
- (C) carry oxygen through the system
- (D) decrease blood viscosity

5. Which drug can be added to saline for irrigation during a vascular procedure?

- (A) Protamine
- (B) Epinephrine
- (C) Sublimaze
- (D) Heparin

6. The intraoperative diagnostic test that measures tissue perfusion is

- (A) blood volume
- (B) respiratory tidal volume
- (C) arterial blood gases
- (D) hematocrit

7. Passage of a sterile catheter into the heart via the brachial or femoral artery for the purpose of image intensification is called

- (A) angiography
- (B) arteriography
- (C) cardiac catheterization
- (D) cardioscopy

8. Hypothermia is employed in cardiac surgery

- (A) to reduce oxygen consumption
- (B) to reduce elevated temperature
- (C) to slow metabolism
- (D) to induce ventricular fibrillation

9. Which vessels are harvested for a coronary artery bypass?

- (A) Pulmonary vein and external mammary vein
- (B) Portal vein and hepatic artery
- (C) Saphenous vein and internal mammary artery
- (D) Pulmonary artery and pulmonary vein

10. If a knitted graft is preclotted, it

- (A) minimizes bleeding
- (B) makes a graft more pliable

- (C) facilitates attachment
- (D) prevents rejection

11. The term used to denote the function accomplished by the cardiopulmonary bypass machine is

- (A) diversion
- (B) dialysis
- (C) perfusion
- (D) profusion

12. The antagonist to heparin sodium is

- (A) epinephrine
- (B) mannitol
- (C) sodium bicarbonate
- (D) protamine sulfate

13. Pedal pulses are assessed with a

- (A) Berman locator
- (B) Doppler
- (C) Mobin–Uddin device
- (D) polytetrafluoroethylene prosthetic (PTFE)

14. Heparin is utilized during vascular surgery

- (A) to coagulate blood

- (B) to correct acidosis
- (C) to constrict arteries
- (D) to prevent thrombosis

15. The prime consideration in a ruptured abdominal aortic aneurysmectomy is

- (A) shunting blood flow
- (B) hemorrhage control
- (C) bypassing occlusion
- (D) removal of thromboembolic material

16. In which surgery would a tunneler be used?

- (A) abdominal aortic aneurysm (AAA)
- (B) Angioplasty
- (C) Embolectomy
- (D) Femoral–popliteal bypass

17. In balloon angioplasty, the dilating balloon is inflated with

- (A) diluted heparin
- (B) diluted solution of contrast media
- (C) saline
- (D) Ringer's lactate solution

18. Which piece of equipment would be placed on an

embolectomy setup for the purpose of removing clots through an arteriotomy?

- (A) Wishard
- (B) Swan–Ganz
- (C) Fogarty
- (D) Garceau

19. The goal of a carotid endarterectomy is to

- (A) remove a thrombus
- (B) provide a shunt for blood flow
- (C) bypass the affected area
- (D) remove plaque

20. Decompression of the portal circulation can be achieved by all of the following EXCEPT

- (A) splenorenal shunt
- (B) portocaval anastomosis
- (C) arteriovenous shunt
- (D) mesocaval shunt

21. Plaque removal from a vessel is termed

- (A) embolectomy
- (B) thrombectomy
- (C) shunt

(D) endarterectomy

22. Placement of a vascular graft proximal to and inclusive of the common iliac vessels will necessitate the use of a/an

(A) autogenous graft

(B) straight Teflon graft

(C) bifurcated graft

(D) polytetrafluorethylene graft

23. The most common vessels used for access procedures to facilitate hemodialysis are

(A) radial artery and cephalic vein

(B) radial artery and cephalic artery

(C) brachial artery and cephalic vein

(D) cephalic artery and brachial vein

24. Migrating clots that have formed in the lower extremities can be intercepted on the way to the heart or lungs by a

(A) Greenfield Filter

(B) Pudenz shunt

(C) Scribner shunt

(D) LeVeen shunt

25. Retraction of fine structures and blood vessels during vascular surgery is accomplished by use of

- (A) Senn retractor
- (B) Penrose drain
- (C) malleable ribbon retractor
- (D) vessel loops

26. Fluoroscopy is required for all of the following vascular procedures EXCEPT

- (A) Greenfield filter
- (B) endocardial pacing electrode
- (C) myocardial pacing electrode
- (D) AV arteriovenous fistula creation

27. A drug used intraoperatively for its antispasmodic effect on the smooth muscle of the vessel wall is

- (A) Ringer's lactate
- (B) papaverine hydrochloride
- (C) Physiosol
- (D) protamine sulfate

28. Compression of subclavian vessels and brachial plexus at the superior aperture of the thorax is known as

- (A) thymoma

- (B) pectus excavatum
- (C) thoracic outlet syndrome
- (D) pectus carinatum

29. In vascular surgery, the term in situ graft references the use of a/an

- (A) autogenous graft
- (B) heterogeneous graft
- (C) allograft
- (D) synthetic graft

30. The surgery scheduled as “Greenfield filter insertion” indicates a diagnosis of

- (A) emboli formation
- (B) venous stasis
- (C) arteriovascular occlusion
- (D) kidney failure

31. During a vascular procedure, monitoring the activated clotting time intraoperatively provides useful data for judging the need for reversal or addition of

- (A) Angiovist
- (B) papaverine
- (C) heparin
- (D) protamine sulfate

32. A low-molecular-weight protein that, when combined with heparin, causes a loss of anticoagulant activity postoperatively is

- (A) papaverine
- (B) protamine sulfate
- (C) tromethamine
- (D) Angiovist

33. What is the purpose for the surgical creation of an arteriovenous fistula?

- (A) Hemodialysis
- (B) Insertion of Greenfield filter
- (C) Peritoneal dialysis
- (D) Placement of Javid shunt

34. Conservative treatment of occlusive disease involving recanalization to restore the lumen of a vessel is called

- (A) PTFE
- (B) percutaneous transluminal angioplasty (PTA)
- (C) Greenfield filter
- (D) endarterectomy

35. What procedure is used intraoperatively and postoperatively to determine blood flow in a vessel?

- (A) Arteriogram
- (B) Swan–Ganz
- (C) Doppler ultrasound
- (D) Angioscopy

36. Removal of atherosclerotic plaque from a major artery is termed

- (A) embolectomy
- (B) aneurysmectomy
- (C) endarterectomy
- (D) thrombectomy

37. An abnormal localized dilatation of an artery resulting from mechanical pressure of blood on a weakened wall is called

- (A) atherosclerosis
- (B) arteriosclerosis
- (C) collateral circulation
- (D) aneurysm

38. What is the treatment of choice for capturing emboli that arise from the pelvis or lower extremities?

- (A) Permacath
- (B) Greenfield filter
- (C) Vas-cath

(D) Porto-cath

39. What intraoperative test determines the needed reversal or addition of heparin?

- (A) Arterial blood gases (ABGs)
- (B) Activated clotting time (ACT)
- (C) Activated partial thromboplastin time (APPT)
- (D) None of the above

40. What drug is used intraoperatively in a topical manner for its direct effect on the muscle of the vessel wall?

- (A) Papaverine hydrochloride
- (B) Heparin
- (C) Topical thrombin
- (D) Protamine sulfate

41. The technique applied to the patient who is unable to be weaned from cardiopulmonary bypass is

- (A) IAPB
- (B) VADs
- (C) Pacemaker
- (D) Both A and B

42. What is the most common acquired valvular lesion?

- (A) Mitral regurgitation
- (B) Mitral stenosis
- (C) Tricuspid valve regurgitation
- (D) Aortic insufficiency

43. What drug is used to effect coronary thrombolysis in the cardiac catheterization laboratory?

- (A) Tissue plasminogen activator
- (B) Heparin
- (C) Streptokinase
- (D) Both A and C

44. The term in situ graft represents the use of a/an

- (A) autograft
- (B) biograft
- (C) dacron graft
- (D) filamentous velour

45. The buildup of fat residue on a vessel wall is

- (A) atherosclerosis
- (B) lipidosis
- (C) vasodilation
- (D) vasoconstriction

46. The self-retaining retractor used when performing a

fem-pop bypass is

- (A) DeBakey
- (B) Finichetto
- (C) Weitlaner
- (D) Gelpi

47. Chronic cerebral ischemia most often leads to

- (A) femoral endarterectomy
- (B) carotid endarterectomy
- (C) electroencephalogram
- (D) electrocardiogram

48. AAAs commonly occur

- (A) above the renal arteries
- (B) below the renal arteries
- (C) above the iliac arteries
- (D) below the iliac arteries

49. Occluding peripheral vessels is achieved with the use of

- (A) Glassman
- (B) Leland Jones
- (C) bulldog
- (D) Myergils

50. When performing an arteriotomy, the surgeon will require a #11 blade and

- (A) Potts Smith scissor
- (B) Metzenbaum
- (C) Lahey
- (D) Stevens

51. Removal of plaque during a carotid endarterectomy requires

- (A) Cobb elevator
- (B) Hurd dissector
- (C) Freer elevator
- (D) None of the above

52. Electrical impulses that stimulate the heart muscle is achieved with

- (A) pacemaker
- (B) arterial defibrillation
- (C) ESU
- (D) alligator clamp

53. Fibrillation is described as

- (A) fast heart rate
- (B) involuntary muscle contraction

- (C) slow heart rate
- (D) coronary artery occlusion

54. The cardiac phase when the ventricles contract is

- (A) systole
- (B) diastole
- (C) fibrillation
- (D) relaxation

55. Bradycardia is defined as _____ beats per minute.

- (A) 40–60
- (B) 80–100
- (C) Higher than 110
- (D) 100–110

56. The most commonly used incision for surgical procedures of the heart is

- (A) right lateral
- (B) left lateral
- (C) anterior thoracotomy
- (D) median sternotomy

57. The aortic valve maintains one way blood flow to the aorta from the

- (A) right atrium
- (B) left atrium
- (C) left ventricle
- (D) right ventricle

58. The only arteries in the body that carry deoxygenated blood to the lungs are

- (A) carotid
- (B) subclavian
- (C) coronary
- (D) pulmonary

59. During dialysis the patients blood is shunted to the outside of the body. The term referring to outside the body is

- (A) in situ
- (B) angiogram
- (C) extracorporeal
- (D) intracorporeal

60. Which of the following is the correct order from outermost to innermost layers of blood vessels:

- (1) tunica adventia
- (2) tunica media
- (3) tunica intima

- (A) 1, 2, 3
- (B) 3, 2, 1
- (C) 3, 1, 2
- (D) 1, 3, 2

61. A Javid shunt is used during a:

- (A) AV fistula
- (B) carotid endarterectomy
- (C) fem–fem bypass
- (D) abdominal aortic aneurysm

62. The relaxation phase of the cardiac cycle is

- (A) systole
- (B) infarction
- (C) diastole
- (D) intraoperative vasospasm

63. A precipitous drop in the patients blood or fluid volume is

- (A) hypovolemia
- (B) hypervolemia
- (C) hypertension
- (D) ischemia

64. The procedure that is performed for dialysis that

produces a direct anastomosis between an artery and a vein is

- (A) cortex graft insertion
- (B) AV shunt
- (C) endarterectomy
- (D) AV fistula

65. When performing a femoral–femoral bypass, the atherosclerotic disease is in the

- (A) femoral artery
- (B) aorta
- (C) femoral vein
- (D) iliac artery

Answers and Explanations

- 1. (A)** In an embolectomy, a Fogarty catheter is inserted beyond the point of clot attachment. The balloon is inflated, and the catheter is withdrawn along with the detached clot (Meeker and Rothrock).
- 2. (C)** Amputated extremities are wrapped before sending them to a refrigerator. The morgue is the usual place that receives them, unless hospital policy dictates otherwise. They must be tagged and labeled properly (Fortunato).
- 3. (B)** Ventricular fibrillation requires prompt defibrillation and cardiopulmonary resuscitation. It is rapidly fatal because respiratory and cardiac arrest follow quickly unless successful defibrillation is effected (Fortunato).
- 4. (A)** Dextran is used to expand plasma volume in emergency situations resulting from shock or hemorrhage. It acts by drawing fluid from the tissues. It remains in the circulatory system for several hours (Fortunato).

- 5. (D)** Heparin may be used locally or systemically to prevent thrombosis during vascular operative procedures. When a vessel is completely occluded during surgery, heparin is often injected directly. Heparinized saline irrigation may also be used. The dosage and concentration may vary according to the surgeon's preference. The saline used must be injectable saline (Fortunato).
- 6. (C)** Serial monitoring of blood gases is indispensable in evaluating pulmonary gas exchange and acid–base balance. Either or both arterial or venous blood gas determination can be monitored. It is a chemical analysis of the blood for concentrations of oxygen and carbon dioxide (Fortunato).
- 7. (C)** Cardiac catheterization is used to diagnose coronary artery disease. It involves a sterile setup and fluoroscopy to diagnose ischemic heart disease. The brachial or femoral artery is used to effect this procedure (Meeker and Rothrock).
- 8. (A)** Hypothermia deliberately reduces body temperature to permit reduction of oxygen consumption by about 50% (Meeker and Rothrock).
- 9. (C)** Coronary artery bypass grafting (CABG) involves harvesting of the saphenous vein and internal

mammary artery (IMA) (Meeker and Rothrock).

- 10. (A)** A knitted graft is prepared before inserting to minimize blood loss from seepage through graft interstices. The patient's own blood may be used, immersing the graft in a small quantity (Meeker and Rothrock).
- 11. (C)** Perfusion is the technique of oxygenating and perfusing the blood by means of a mechanical pump-oxygenator (Fortunato).
- 12. (D)** Protamine sulfate reverses heparin (Meeker and Rothrock).
- 13. (B)** Pedal pulse can be assessed manually or with an ultrasonic instrument (Doppler). It assesses movement of blood through a vessel (Meeker and Rothrock).
- 14. (D)** Heparin may be used locally or systemically to prevent thrombosis during an operative procedure (vascular). It can be injected directly or used as a heparinized saline irrigation (eg, 5000 units in 500 mL of saline) (Meeker and Rothrock).
- 15. (B)** The prime surgical consideration when a rupture or dissection occurs is the control of hemorrhage by occluding the aorta proximal to the point of rupture

(Meeker and Rothrock).

- 16. (D)** A femoral–popliteal bypass is the restoration of blood flow to the leg with a graft bypassing the occluded section of the femoral artery with either a saphenous vein or a graft. The tunneler is passed from the popliteal fossa to the groin, and the graft is pulled through (Meeker and Rothrock).
- 17. (B)** The goal is to restore internal patency of a vessel by creating a channel through the diseased artery and then introducing a balloon catheter. The dilating balloon is inflated with fluid consisting of a dilute solution of the contrast media (Meeker and Rothrock).
- 18. (C)** During an arterial embolectomy, a Fogarty catheter is carefully inserted into an artery and placed beyond the point of the clot attachment. The balloon is inflated, and the catheter is withdrawn along with the attached clot (Meeker and Rothrock).
- 19. (D)** Carotid endarterectomy is the removal of an atheroma (plaque) at the carotid artery bifurcation. A temporary shunt or bypass can be used (Meeker and Rothrock).
- 20. (C)** Shunt operations for portal hypertension are splenorenal shunt, portocaval anastomosis, and

mesocaval shunt. An arteriovenous shunt is used for dialysis (Meeker and Rothrock).

- 21. (D)** Endarterectomy is the removal of arteriosclerotic plaque from an obstructed artery. It occurs frequently at the bifurcation of the vessel (Meeker and Rothrock).
- 22. (C)** A graft placed proximal to and inclusive of the common iliac vessels will necessitate the use of a bifurcation into the common iliac branches (Meeker and Rothrock).
- 23. (A)** Either a shunting device or an arteriovenous fistula using the radial artery and cephalic vein are used to facilitate hemodialysis (Meeker and Rothrock).
- 24. (A)** A filter device may be inserted (in its collapsed form) through a cutdown in a large vein, usually the right internal jugular. The Greenfield filter is shaped like an umbrella. It is designed to allow blood to pass through the vena cava while filtering clots (Meeker and Rothrock).
- 25. (D)** To prevent undue trauma, umbilical tapes or vessel loops are used for retraction and vascular control (Meeker and Rothrock).

- 26. (C)** Vena cava filter insertion entails partial occlusion of the IVC with an intravascular filter, such as Greenfield, inserted under fluoroscopy. So too is an endocardial pacing electrode, which attaches to a pacemaker that is placed beneath the skin and powers the electrode. A seldom used myocardial pacing system requires a thoracotomy and direct visualization (Meeker and Rothrock).
- 27. (B)** Vasospasm may be of particular concern in working with small vessels during a procedure. Papaverine HCl may be added to saline solution for its direct antispasmodic effect on the smooth muscle of the vessel wall (Meeker and Rothrock).
- 28. (C)** The cause of this compression of the subclavian vessels, known as thoracic outlet syndrome, is usually congenital deformity or traumatic injury to the first rib (Meeker and Rothrock).
- 29. (A)** In situ femoral popliteal bypass is the restoration of blood flow to the leg bypassing an occluded portion of the femoral artery with a patient's own saphenous vein. The advantages of a vein bypass procedure include graft availability and improved patency (Meeker and Rothrock).
- 30. (A)** Greenfield vena cava filter insertion entails the

partial occlusion of the inferior vena cava (IVC) with an intravascular filter that maintains a patent vena cava but prevents pulmonary embolism by trapping emboli at the apex of the device (Meeker and Rothrock).

31. (C) Heparin is the most common drug used in vascular surgery. It may be given as an intravenous bolus to systemically anticoagulate the patient. It is given just before the placement of the vascular clamp and is monitored regularly during surgery to determine its level in the body (Meeker and Rothrock).

32. (B) A low-molecular-weight protein that, when combined with heparin, causes a loss of anticoagulant activity is called protamine sulfate. It is administered by the anesthesiologist IV after bypass is complete (Meeker and Rothrock).

33. (A) A direct anatomic arteriovenous fistula provides a dilated vein valuable for direct cannulation with large-bore needles for hemodialysis (Meeker and Rothrock).

34. (B) PTA is a conservative treatment for localized or segmental stenosis or occlusive vascular disease. PTA recanalizes the vessel to allow for better flow. PTFE is a microporous graft for bypass. Greenfield filters are placed to catch venous thrombi, and endarterectomy

requires the opening and scraping of a vessel to remove plaque (Fortunato).

- 35. (C)** After vascular closure is completed, a Doppler pulse detector (ultrasound) is used to check patency of a vessel and ultimate blood flow (Fortunato).
- 36. (C)** Endarterectomy is the excision of diseased endothelial lining of an artery and the occluding atheromatous deposits in the lumen (Fortunato).
- 37. (D)** Loss of structural integrity is implicit in this weakened structure. This localized abnormal dilatation results from mechanical pressure of blood on a vessel wall (Fortunato).
- 38. (B)** Vena cava filter insertion entails the partial occlusion of the IVC with an intravascular filter, inserted under fluoroscopy. The Greenfield device offers the option of jugular or femoral vein insertion. It is the most widely successful device available (Meeker and Rothrock).
- 39. (B)** Monitoring the ACT intraoperatively provides useful data for judging the need for reversal or addition of heparin (Meeker and Rothrock).
- 40. (A)** Papaverine hydrochloride may be added to a

heparinized saline for its direct antispasmodic effect on the smooth muscle of the vessel wall and its vasodilating properties (Meeker and Rothrock).

- 41. (D)** The IAPB is a technique that employs the principle of counterpulsation. It increases the cardiac output and may permit separation of the patient from CPB. VADs are designed to augment cardiac output if patients cannot be weaned from CPB with IAPB (Meeker and Rothrock).
- 42. (B)** Mitral stenosis, the most common acquired valvular lesion, is usually caused by rheumatic fever. It causes a rise in pressure and dilatation of the left atrium (Meeker and Rothrock).
- 43. (D)** The cardiac catheterization laboratory has also become the site for more aggressive interventional therapies related to evolving and acute myocardial infarctions. Coronary thrombolysis with streptokinase and tissue plasminogen activator can dissolve fresh blood clots and reopen the artery (Meeker and Rothrock).
- 44. (A)** To vascularize a lower extremity, the saphenous vein is exposed but left in place. Using a valvutome or scissors, the valves are cut to allow reversal of blood flow. When a segment of vein is harvested, the vein is

reversed so that valves will not obstruct blood flow (Fortunato).

45. (A) Atherosclerosis is the buildup of fat residue on a vessel wall (Fuller).

46. (C) A Weitlaner is a retractor used to retract during a fem-pop bypass (Fuller).

47. (B) A carotid endarterectomy is performed when there is plaque in the carotid artery causing cerebral ischemia (Fuller).

48. (B) AAA commonly occurs below the renal arteries (Fuller).

49. (C) Bulldogs are used to occlude peripheral vessels (Fuller).

50. (A) An arteriotomy is performed using an #11 blade and a Potts Smith scissor (Fuller).

51. (C) A Freer elevator is used to peel plaque off of the carotid artery during endarterectomy (Fuller).

52. (A) An artificial pacemaker is implanted in the body to correct cardiac arrhythmia caused by disease at the conduction system (Fuller).

- 53. (B)** Fibrillation is a small local involuntary muscle contraction due to spontaneous activation of single muscle cells or muscle fibers (Miller Keane).
- 54. (A)** Contraction of the ventricles during which blood is forced into the aorta and the pulmonary artery (Miller Keane).
- 55. (A)** Bradycardia is a heart rate from 40–60 (Fuller).
- 56. (D)** A median sternotomy is the most common incision used in heart surgery (Fuller).
- 57. (C)** The aortic valve maintains one way blood flow to the aorta from the left ventricle (Fuller).
- 58. (D)** Arteries are vessels that carry oxygenated blood away from the heart to the rest of the body except the pulmonary arteries. They carry deoxygenated blood (Fuller).
- 59. (C)** The term extracorporeal refers to outside the body (Fuller).
- 60. (A)** Blood vessels have three layers. Tunica adventia is the outermost. The middle is the tunica media and the inner is the tunica intima (fuller).
- 61. (B)** During a carotid endarterectomy a Javid shunt is

used to provide continuous blood flow to the brain. The shunt is inserted into the internal and common carotid arteries (Fuller).

62. (C) Diastole is the phase where there is maximum cardiac relaxation (Mosby).

63. (A) With hypotension there is a drop in blood pressure. There is a fluid shift between spaces in the body also caused by shock and infection (Fuller).

64. (D) The two techniques used for hemoaccess is an AV fistula which is a direct connection between an artery and a vein and an AV shunt is a gortex graft that is used to connect the cephalic vein and the brachial artery (Fuller).

65. (D) A Fem–fem bypass is performed for atherosclerotic disease in the iliac arteries. For a fem–pop bypass, the disease is in the femoral artery (Fuller).

CHAPTER 28

Orthopedic Surgery

Questions

1. Seamless tubular cotton that stretches to fit a contour and is used for padding is called

- (A) Ace bandage
- (B) Webril
- (C) sheet wadding
- (D) stockinette

2. What is the proper wrapping procedure utilizing an Esmarch bandage?

- (A) Start at the distal end of the extremity
- (B) Start at the proximal end of the extremity
- (C) Start after the cuff is inflated
- (D) Start at the incision site

3. Baker's cysts are found in the

- (A) popliteal fossa
- (B) interdigital fossa
- (C) intercarpal joints
- (D) olecranon fossa

4. Benign outpouchings of synovium from inter-carpal joints are called

- (A) ganglia
- (B) exostosis
- (C) polyps
- (D) synovitis

5. Compression of the median nerve at the volar surface of the wrist is known as

- (A) Dupuytren's contracture
- (B) carpal tunnel syndrome
- (C) ganglia
- (D) Volkmann's contracture

6. A fixation device that provides maximum holding and rigid fixation of a fracture by tightening bone fragments together is called a/an

- (A) compression plate and screws
- (B) intramedullary nailing
- (C) Ilizarov technique
- (D) interlocking nail fixation

7. In a total hip replacement, which structure is reamed?

- (A) Acetabulum

- (B) Greater trochanter
- (C) Lesser trochanter
- (D) Femoral head

8. The ideal candidate for a noncemented total hip arthroplasty is

- (A) young and healthy person
- (B) young with arthritis
- (C) old and healthy
- (D) old with osteoporotic bone disease

9. A total hip replacement would be indicated when the patient has

- (A) degenerative hip joint disease
- (B) hip fracture
- (C) congenital hip dislocation
- (D) hip cancer

10. Joint reconstruction is known as

- (A) arthrodesis
- (B) arthroplasty
- (C) arthrotomy
- (D) arthropexy

11. Osteogenesis or bone growth can be induced by

- (A) bone grafting, autogenous
- (B) bone grafting, homogeneous
- (C) hormone installation
- (D) electrical stimulation

12. An infection in bone is termed

- (A) osteomalacia
- (B) osteomyelitis
- (C) osteitis
- (D) osteoporosis

13. A surgical procedure designed to stiffen or fuse a joint is called

- (A) arthropexy
- (B) arthroplasty
- (C) joint fixation
- (D) arthrodesis

14. A lateral curvature of the spine is

- (A) kyphosis
- (B) scoliosis
- (C) lordosis
- (D) orthosis

15. Harrington rods are used to treat

- (A) femoral fracture
- (B) scoliosis
- (C) talipes deformity
- (D) congenital hip dislocation

16. The congenital deformity known as clubfoot is surgically referred to as

- (A) talipes valgus
- (B) talipes varus
- (C) hallux valgus
- (D) exostosis

17. The most frequent site of cartilage tears in the knee joint are at the

- (A) collateral ligament
- (B) cruciate ligament
- (C) lateral meniscus
- (D) medial meniscus

18. An abduction pillow would be used to

- (A) immobilize hip joints after hip surgery
- (B) stabilize a femoral fracture
- (C) immobilize the tibia postsurgery

(D) rotate the hips outward after hip reconstruction

19. A Free Lock compression screw system is indicated for correction of a/an _____ fracture.

- (A) hip
- (B) wrist
- (C) elbow
- (D) cervical

20. Decreased bone mass results in a condition called

- (A) osteoporosis
- (B) osteomyelitis
- (C) ossification
- (D) ecchymosis

21. Place the stages of fracture healing in order: (1) hematoma formation, (2) remodeling, (3) fibrin network formation, (4) callus formation, (5) invasion of osteoblasts.

- (A) 1, 3, 5, 4, 2
- (B) 1, 2, 5, 4, 3
- (C) 1, 3, 2, 4, 5
- (D) 5, 3, 4, 1, 2

22. An olecranon fracture occurs in the

- (A) wrist
- (B) knee
- (C) elbow
- (D) finger

23. All of the following are considered good methods of maintaining strict asepsis within an orthopedic surgical suite EXCEPT

- (A) ultraviolet light
- (B) laminar flow rooms
- (C) charcoal masks
- (D) space suits

24. Water temperature for plaster cast application is

- (A) 50°F–55°F
- (B) 70°F–75°F
- (C) 85°F–90°F
- (D) 95°F–100°F

25. Orthopedic surgery prepping

- (A) is done under sterile conditions
- (B) is done the day before surgery
- (C) is eliminated
- (D) is increased in time only

26. Limb exsanguination is accomplished by using

- (A) limb elevation
- (B) tourniquet application
- (C) Kling bandage
- (D) Esmarch bandage

27. In orthopedic surgery, the viewing of the progression of a procedure on a television screen is known as

- (A) image intensification
- (B) radiography
- (C) portable filming
- (D) X-ray

28. Surgery on the medial malleolus would be of the

- (A) fibula
- (B) jaw
- (C) tibia
- (D) radius

29. Plaster is ready for application

- (A) when air bubbles cease to rise
- (B) when air bubbles begin to rise
- (C) after 2 minutes of submersion
- (D) after 10 minutes of submersion

30. Which fracture most commonly occurs in childhood?

- (A) Spiral
- (B) Compound
- (C) Greenstick
- (D) Comminuted

31. Which orthopedic hip procedure is indicated for patients with degenerative joint disease or rheumatoid arthritis?

- (A) AO external fixation
- (B) Total hip arthroplasty
- (C) Femoral endoprosthesis
- (D) Modular endoprosthesis

32. What skeletal traction requires the use of sterile supplies for application of a traction appliance?

- (A) Thomas splint
- (B) Russell
- (C) Crutchfield
- (D) Buck's extension

33. An infectious musculoskeletal condition affecting the bone and marrow is

- (A) osteomalacia

- (B) osteoporosis
- (C) osteomyelitis
- (D) Paget's disease

34. An immobilization device used after total hip arthroplasty is

- (A) adduction pillow
- (B) abduction pillow
- (C) sling
- (D) splint

35. Electrical stimulation is artificially applied postoperative electrical current that influences

- (A) osteomalacia
- (B) osteogenesis
- (C) osteoporosis
- (D) osteoarthritis

36. All of the following are indications for external fixation EXCEPT

- (A) infected joints
- (B) clean long-bone fractures
- (C) highly comminuted closed fractures
- (D) major alignment and length deficits

37. A procedure done to correct recurrent anterior dislocation of the shoulder that involves reattachment of the rim of the glenoid fossa is called a

- (A) Bankart
- (B) Putti–Platt
- (C) Bristow
- (D) Monteggia

38. The most commonly fractured carpal bone is the

- (A) scaphoid
- (B) lunate
- (C) trapezium
- (D) capitate

39. Compression force of the distal femur upon the tibia produces varying types of fractures of the

- (A) patella
- (B) tibia plateau
- (C) femoral condyle
- (D) head of the femur

40. Surgery that requires incision of the long extensor tendon of the interphalangeal joint of the four lateral toes and subsequent fusion is called

- (A) exostectomy
- (B) Keller procedure
- (C) hammer toe correction
- (D) McBride procedure

41. The rare use of laser during orthopedic surgery may be seen in the use of the CO₂ laser during a revision arthroplasty to

- (A) remove a cemented implant
- (B) vaporize protein
- (C) weld tissue for collagen bonding
- (D) create hemostasis

42. After surgery on a shoulder, the arm may be bound against the side of the arm for

- (A) comfort
- (B) abduction
- (C) immobilization
- (D) mobilization

43. The most commonly used implants in hand surgery are made of flexible

- (A) polypropylene
- (B) Silastic
- (C) tantellum

(D) polyethylene

44. Before the insertion of cement into the femoral medullary canal during a total hip arthroplasty, which of the following is placed with an inserter to occlude the femoral medullary canal?

- (A) Polyethylene insert
- (B) Cement restrictor
- (C) Broach
- (D) Distal centralizer

45. Femoral prostheses such as Austin Moore and Thompson are used to correct all of the following diagnoses EXCEPT

- (A) avascular necrosis
- (B) nonunion fractures
- (C) displaced femoral neck fractures
- (D) rheumatoid arthritis

46. Orthopedic implants are covered by all of the following rules EXCEPT

- (A) different metals should not be mixed because they may react chemically
- (B) If the implant is driven by force, a driver with a metal head must be used

- (C) a template must be used for sizing purposes
- (D) handle as little as possible before insertion

47. Galvanic corrosion is a process that occurs postoperatively because of

- (A) poor handling of device during implant
- (B) mixed use of metals for implant
- (C) misplacement of implant
- (D) damage of an implanted device

48. Bunionectomy is also known as

- (A) metacarpal arthroplasty
- (B) hallux valgus
- (C) triple arthrodesis
- (D) hammer toe

49. A Colles fracture is a fracture of

- (A) distal radius
- (B) femur
- (C) patella
- (D) fibula

50. The Keller and McBride procedures are types of

- (A) bunionectomy procedures

- (B) shoulder repairs
- (C) ankle repairs
- (D) patellectomy procedure

51. The three phases of bone healing in order are

- (1) remodeling
- (2) inflammatory phase
- (3) repairative phase

- (A) 1, 2, 3
- (B) 2, 1, 3
- (C) 2, 3, 1
- (D) 3, 1, 2

52. The patella is what type of bone?

- (A) Flat
- (B) Short
- (C) Sesmoid
- (D) Round

53. Polymethylmethacrylate (PMMA) is a type of bone cement most commonly used in what procedure?

- (A) Arthroplasty procedures
- (B) Kellar procedures
- (C) ACL repair
- (D) Triple arthrodesis

54. The proper position for the patient undergoing arthroscopic knee surgery is

- (A) skeletal traction on fracture table
- (B) lateral position, foot of table flexed at 45 degrees
- (C) the Alvarado knee holder
- (D) supine position, foot of table flexed at 90 degrees

55. Orthopedic saws are identified by the movement of the blade. Which saw blade is mounted along the same axis as the handle and moves back and forth?

- (A) Saggital
- (B) Reciprocating
- (C) Oscillating
- (D) Rotating

56. An orthopedic screw is the most commonly used type of orthopedic implant. All are orthopedic screws EXCEPT

- (A) cancellous
- (B) lag
- (C) self-tapping
- (D) depth screw

57. The three main components of a knee arthroplasty are
(1) femoral

- (2) acetabular
- (3) tibial base plate
- (4) patella component

- (A) 1, 3, 4
- (B) 1, 2, 3
- (C) 2, 3, 4
- (D) 4, 2, 1

58. Which graft/grfts are used to replace the anterior cruciate ligament during an ACL repair?

- (A) Patella tendon
- (B) Cadaver
- (C) Hamstring or quadracep
- (D) All of the above

59. A Putti–Plat is used to correct

- (A) ankle
- (B) wrist
- (C) patella
- (D) shoulder

60. What connects bone to bone?

- (A) Ligament
- (B) Tendon

- (C) Muscle
- (D) Bursa

61. The shaft of the long bone is _____ and the end of the long bone is _____.

- (A) diaphysis/epiphysis
- (B) epiphysis/diaphysis
- (C) symphysis/diaphysis
- (D) symphysis/epiphysis

62. A fracture that consists of multiple bone fragments is

- (A) comminuted
- (B) greenstick
- (C) spiral
- (D) impacted

63. Bone healing is termed

- (A) osteoporosis
- (B) osteoplasty
- (C) osteogenesis
- (D) osteomalacia

64. A hemostatic agent used on bone is

- (A) heparin

- (B) bone wax
- (C) lidocaine
- (D) cottonoid

65. A pneumatic tourniquet is placed

- (A) as soon as the patient enters the OR
- (B) directly after the patient is prepped and draped
- (C) before the patient is prepped and draped
- (D) as soon as anesthesia says it is okay

66. Equipment needed to repair a femoral neck fracture using a compression screw and sliding plate includes all of the following EXCEPT

- (A) fracture table
- (B) C-arm (fluro)
- (C) K wires
- (D) pneumatic tourniquet

67. A pressurized solution of antibiotics or saline, commonly used for wound debridement and irrigation is called

- (A) pulse lavage system
- (B) ancillary system
- (C) inactive irrigation system
- (D) topical irrigation system

68. A traction that requires surgical insertion of metal rods or pins through bone, and are attached to a traction device that applies force or is attached to a weighted pulley is known as

- (A) skin traction
- (B) applied traction
- (C) manual traction
- (D) skeletal traction

69. During a procedure involving a power saw in use, the surgical technician in the scrub role should

- (A) clean the blade
- (B) lightly apply irrigation to the blade in use
- (C) suction bone debris
- (D) do nothing

70. The condition where fibrous bands cause contractures in the fingers, commonly the ring finger and the little finger is

- (A) compartment syndrome
- (B) dupuytren's
- (C) exostosis
- (D) ganglion

71. The condition that involves the proximal inter-

phalangeal (PIP) joint of the foot is called

- (A) bunion
- (B) dupuytren's
- (C) hammertoe
- (D) hallux valgus

72. The surgical repair of a torn tendon is

- (A) triple arthrodesis
- (B) percutaneous tendonectomy
- (C) tendonitis
- (D) tenorrhaphy

73. The tendon involved causing the inability to plantar flex the foot is

- (A) Achilles
- (B) lateral metatarsal
- (C) capsular tendon
- (D) digitorum tendon

74. The position of Mrs. Smedley on the OR table is

- (A) lateral
- (B) supine
- (C) prone
- (D) semi-Fowlers

75. The responsibility of the STSR when applying the case is to keep the foot in a plantar flexed position (toes downward) in order to

- (A) keep good blood supply to the foot
- (B) keep the muscle hyperextended
- (C) keep stress off the new suture line
- (D) this allows the local to penetrate the surgical site

Answers and Explanations

- 1. (D)** Stockinette is a knitted, seamless tubing of cotton 1–12 inches wide. It stretches to fit any contour snugly (Fortunato).
- 2. (A)** Wrapping of an extremity begins at the distal end (Fortunato).
- 3. (A)** Baker's cysts are found in the popliteal fossa. They are frequently painful and can become large. Excision requires prone position (Meeker and Rothrock).
- 4. (A)** Ganglia are benign outpouchings of synovium from the intercarpal joints that become filled with synovial fluid. They often resolve spontaneously but occasionally must be excised (Meeker and Rothrock).
- 5. (B)** In carpal tunnel syndrome, the median nerve becomes compressed at the volar surface of the wrist because of thickened synovium, fractures, or aberrant muscles (Meeker and Rothrock).
- 6. (A)** Rigid fixation by compression plate and screws

uses heavy and strong compression plates to give maximum hold and rigid fixation. Tightening the nut on compression instruments brings bone fragments together (Fortunato).

- 7. (A)** The femoral head is removed and replaced with a prosthesis. The acetabulum is reamed to the configuration of the acetabulum component, which is then fixed in the socket (Fortunato).
- 8. (A)** Young active individuals with strong healthy bones are ideal candidates for noncemented total hip replacement. Elderly patients with osteoporotic and those patients with poor quality bone are usually candidates for cement because their bones may lack the compressive strength to support weight-bearing forces (Meeker and Rothrock).
- 9. (A)** Total hip replacement is indicated for patients with hip pain caused by degenerative joint diseases or rheumatoid arthritis (Fortunato; Meeker and Rothrock).
- 10. (B)** Reconstruction of a joint (arthroplasty) may be necessary to restore or improve range of motion and stability or to relieve pain (Fortunato).
- 11. (D)** Electrical stimulation is artificially applied

electrical current that induces or influences osteogenesis. This accelerates fracture healing. Bone growth stimulations also are used in treating infected nonunions because the electrical stimulation retards bacterial growth (Meeker and Rothrock).

- 12. (B)** Osteomyelitis (infection in bone) occurs after bone is injured in an accident or is involved in surgical repair. It may cause nonunion of fractures. Microorganisms reach the bone via the bloodstream. *Staphylococcus aureus* is commonly the causative agent (Fortunato; Tortora and Grabowski).
- 13. (D)** Arthrodesis is most commonly employed to relieve pain by eliminating motion, to provide stability where normal ligament stability has been destroyed, or to correct deformity by realignment at the level of fusion (Fortunato).
- 14. (B)** Scoliosis is a lateral curve and rotation of the spine (Fortunato).
- 15. (B)** Harrington rods are used with spinal fusion to treat scoliosis (Fortunato).
- 16. (B)** Talipes varus, the condition known as club-foot, refers to the inversion of the forefoot (Fortunato).

- 17. (D)** Tears in the menisci (semilunar cartilage) are the most common knee injuries occurring most frequently in the medial meniscus (Meeker and Rothrock).
- 18. (A)** An abduction pillow aids in immobilizing hip joints after surgery (Meeker and Rothrock).
- 19. (A)** Internal fixation of a hip can be accomplished with a free-lock compression hip screw fixation system allowing earlier ambulation and thus fewer complications (Meeker and Rothrock).
- 20. (A)** Osteoporosis is an age-related disorder characterized by increased susceptibility to fractures as a result of decreased levels of estrogen (Tortora and Grabowski).
- 21. (A)** The bone healing process begins with hematoma formation, fibrin network formation, invasion of osteoblasts, callous formation and remodelling.
- 22. (C)** An olecranon fracture occurs in the elbow (Meeker and Rothrock).
- 23. (C)** Charcoal masks when used in the OR restrict inhaling vaporized particles of viruses such as venereal warts. All of the others are varying degrees of specialized units that address the principle of “strict

surgical asepsis” for orthopedic surgery (Fortunato).

- 24. (B)** Water cast application is at room temperature: 70°F–75°F (Fortunato).
- 25. (A)** A primary concern in orthopedic surgery is the prevention of infection, thus calling for meticulous technique with the operative scrub carried out under sterile conditions (Meeker and Rothrock).
- 26. (D)** An Esmarch rubber bandage is used to exsanguinate the limb; the tourniquet is then inflated (Meeker and Rothrock).
- 27. (A)** During orthopedic surgery, the mobile image intensification, also referred to as fluoroscopy or X-ray image, allows viewing of the case progression (Meeker and Rothrock).
- 28. (C)** Ankle fractures include fracture of the medial malleolus (tibia), lateral malleolus (fibula), and posterior malleolus (posterior distal fibia) (Meeker and Rothrock).
- 29. (A)** When preparing plaster rolls or splints, they are submerged in room temperature water (70°F–75°F). Water above this temperature will speed up the process and make the cast application ineffective.

When bubbles cease to rise to the surface, the rolls are removed, lightly compressed, and used (Fortunato).

- 30. (C)** An incomplete fracture, only partly through the bone, is commonly found in children whose bones have not yet calcified. This is a greenstick fracture (Tortora and Grabowski).
- 31. (B)** The hip procedure indicated for degenerative joint disease or rheumatoid arthritis is total hip arthroplasty, cemented, or noncemented. All of the others are femoral head components used to treat fractures that have not achieved union in a conventional manner (Meeker and Rothrock).
- 32. (C)** Some cervical spine fractures or injuries may require Crutchfield or Gardner–Wells tongs inserted into the skull to stabilize the vertebrae and reduce spinal cord damage. Application of traction requires the use of sterile supplies, including a bow, pins, and drill (Meeker and Rothrock).
- 33. (C)** An infectious musculoskeletal condition affecting the bone and the marrow is osteomyelitis. This infection may develop from blood-borne pathogens deposited at the site. The infection develops as pathogenic organisms become trapped in small arteries in the metaphyseal area (Meeker and

Rothrock).

- 34. (B)** Splints and slings are both immobilization devices used in orthopedics. The device used after total joint replacement is the abduction pillow. This prevents adduction, internal rotation, and hip flexion, which could dislocate the hip (Meeker and Rothrock).
- 35. (B)** Three types of stimulators that induce osteogenesis are implantable, percutaneous, and capacitance coupling (Meeker and Rothrock).
- 36. (B)** This method of fracture management provides rigid fixation and reduction with the ability to manage severe soft tissue wounds (Meeker and Rothrock).
- 37. (A)** A Bankart procedure involves reattachment of the anterior capsule to the rim of the glenoid fossa. A Putti–Platt is similar; in addition, it requires the lateral advancement of the subscapularis and produces a barrier against dislocation of the shoulder (Meeker and Rothrock).
- 38. (A)** The scaphoid is the most commonly fractured carpal bone. Internal fixation is generally accomplished with Kirschner wires, small compression screws, or minifragment compression plates and screws (Meeker and Rothrock).

- 39. (B)** Tibial plateau fractures have historically been attributed to bumper or fender injuries. Compression force of the distal femur upon the tibia produces varying types of plateau fractures (Meeker and Rothrock).
- 40. (C)** A hammer toe flexion deformity develops at the proximal interphalangeal joint of the four lateral toes. It is treated by incising the long extensor tendon and fusing the middle joint (Meeker and Rothrock).
- 41. (A)** Although not used as commonly as in other surgical specialties, lasers are used in some orthopedic procedures. Methyl methacrylate can be vaporized with a carbon dioxide laser to remove a cemented implant. Nd:YAG laser can be used in arthroscopy to vaporize protein as well as to weld tissue by bonding collagen (Fortunato).
- 42. (C)** After a shoulder procedure, the arm may be bound against the side for immobilization. An absorbent pad or a large piece of cotton or sheet wadding is placed under the arm to keep skin surfaces from touching because they may macerate (Fortunato).
- 43. (B)** The most commonly used implants in hand surgery are flexible implants made of Silastic. They are available for arthroplasty within the scope of hand

surgery, such as finger joints, wrist joints, carpal trapezium, lunate, and navicular (Meeker and Rothrock).

- 44. (B)** After reaming of the femoral canal has been accomplished, a trial component is fitted. After removal of the trial, the canal is lavaged and brushed to accommodate the femoral component. A cement restrictor is inserted into the femoral canal. The cement is injected, and the femoral component with proximal and distal centralizers is inserted (Meeker and Rothrock).
- 45. (D)** These implants are a single unit including stem and head, which require limited rasping and canal preparation. Currently, this is the accepted treatment for nonunion fractures, avascular necrosis, and osteoarthritis. Total hip replacement is generally indicated for patients with degenerative joint disease or rheumatoid arthritis (Meeker and Rothrock).
- 46. (B)** Metal implants are extremely expensive. Once an implant has been scratched, it cannot be used. All personnel should follow these rules: store separately, handle as little as possible, use a driver with a Teflon head to drive the implant, do not bend, and use a template for sizing purposes (Fortunato).

- 47. (B)** Many different alloys are used in the manufacture of implants. However, the implantation of devices with different metallic composition must be avoided to prevent galvanic corrosion; internal fixation devices used during an orthopedic procedure should be of the same metal (Meeker and Rothrock).
- 48. (A)** A bunionectomy is an enlarged metatarsal head, hallux valgus. It is reduced or removed. The goal of this surgery is to alleviate pain and increase mobility (Fuller).
- 49. (A)** A colles fracture is an angulated fracture of the distal radius (Fuller).
- 50. (A)** Keller and mcbride are variations of bunionectomies (Fuller).
- 51. (C)** The three phases of bone healing in order are inflammatory, reparative, and remodeling (Fuller).
- 52. (C)** Patella is a type of sesmoid bone. They are irregularly shaped bones (Fuller).
- 53. (A)** Implants used in arthroplasties (joint replacement) may be cemented in place with PMMA.
- 54. (D)** The patient is placed in supine position and the foot of the table may be flexed at 90 degrees (Fuller).

- 55. (C)** The oscillating blade is mounted along the same axis as the handle and moves back and forth (Fuller).
- 56. (D)** Orthopedic screws come in different sizes, shapes, and designs. They are made of titanium, stainless steel or bioabsorbable material. They include cancellous, cortical, lag, Herbert, locking, cannulated, and self-tapping (Fuller).
- 57. (A)** The three components are the metal femoral component inserted over the distal femur, tibial base plate placed over the proximal tibia, and a polyethylene patellar component (Fuller).
- 58. (D)** A graft can be taken from the central portion of the patellar tendon, hamstring or quad, or using a cadaver graft (Fuller).
- 59. (D)** The pathology is the same as for a Bankart repair, the procedure is used to correct a recurrent anterior dislocation of the shoulder (Fuller).
- 60. (A)** A ligament is a band of fibrous connective tissue connecting to the articular ends of bones and serving to bind bones together (Fuller).
- 61. (A)** Each long bone has a geographic landmark. The shaft of the long bone is the diaphysis and the end of

the long bone is the epiphysis (Fuller).

- 62. (A)** This type of fracture consists of multiple bone fragments and fractured bone. It also may require repair of both soft tissue and bone (Fuller).
- 63. (C)** Osteogenesis is bone healing (Fuller).
- 64. (B)** During surgery, a waxy preparation called bone wax (oselene) is pressed into the bleeding area of bone to control bleeding (Fuller).
- 65. (C)** The tourniquet cuff is placed proximal to the surgical site before the patient is prepped (Fuller, 4th ed.).
- 66. (D)** A pneumatic tourniquet is used on extremity surgery. A fracture table is used to reduce the fracture. Fluoro is used to view the fracture and K wires are used to stabilize a fracture (Fuller).
- 67. (A)** The pulse lavage system uses antibiotic solution or saline solution to apply a pulsed stream of pressurized solution to the wound for debridement and irrigation (Fuller).
- 68. (D)** Metal rods or pins through the bone is skeletal traction (Fuller).

- 69. (B)** Power instruments generate heat due to friction of saw on bone. To prevent surrounding tissue injury, the STSR should irrigate the tip of the blade with an aseptic syringe and sterile saline (with surgeon's approval) (Fuller).
- 70. (B)** Dupuytren's contracture is when fibrous bands cause contractions in the fingers usually the ring finger and little finger. They are seldom painful; however, they cause restriction of extension but not flexion because it does not involve the flexor tendon (Fuller).
- 71. (C)** A hammertoe is when the toe has contracted at the proximal interphalangeal joint caused by severe pressure and pain. Ligaments and tendons tighten and cause the toe joint to curl down (Fuller).
- 72. (D)** Tenorrhaphy is the surgical repair of a tendon (Fuller).
- 73. (A)** Achilles tendon rupture presents with the inability to plantar flex the foot (Fuller).
- 74. (B)** The patient is placed in supine position with the affected leg supported by a soft support or sandbag (Fuller).

75. (C) The responsibility of the STSR is to keep the foot plantar flexed and keep stress off the new suture line (Fuller).

CHAPTER 29

Neurosurgery

Questions

1. Raney clips are

- (A) skin clips
- (B) hemostatic clips
- (C) aneurysm clips
- (D) hemostatic scalp clips

2. Which of the following are tongs providing skeletal traction for cervical fracture/dislocation?

- (A) Yasargil
- (B) Cushing
- (C) Gigli
- (D) Crutchfield

3. A surgical procedure used most frequently to control intractable pain of terminal cancer is called a

- (A) sympathectomy
- (B) neurectomy
- (C) cordotomy
- (D) thermocoagulation

4. Which operative procedure facilitates the draining of a subdural hematoma?

- (A) Cranioplasty
- (B) Hypophysectomy
- (C) Craniosyntosis
- (D) Burr holes

5. Hemostasis in neurosurgery is achieved by using Gelfoam saturated with saline solution or

- (A) heparin
- (B) topical thrombin
- (C) mannitol
- (D) epinephrine

6. A tumor arising from the covering of the brain is a/n

- (A) hemangioblastoma
- (B) angioma
- (C) meningioma
- (D) glioma

7. Which of the following is used to control bleeding beneath the skull and around the spinal cord?

- (A) Webril
- (B) Gauze sponges

- (C) Cottonoid
- (D) Kitners

8. A large, encapsulated collection of blood over one or both cerebral hemispheres that produces intracranial pressure is known as a/n

- (A) epidural hematoma
- (B) intracerebral hematoma
- (C) subdural hematoma
- (D) subarachnoid hematoma

9. A surgical procedure in which a nerve is freed from binding adhesion for relief of pain and restoration of function is termed a

- (A) neurexeresis
- (B) neurorrhaphy
- (C) neurotomy
- (D) neurolysis

10. Surgical creation of a lesion in the treatment of a disease such as Parkinson is called

- (A) cryosurgery
- (B) diathermy
- (C) rhizotomy
- (D) pallidotomy

11. During neurosurgical procedures, venous stasis in the lower extremities and maintenance of blood pressure may be aided by all of the following EXCEPT

- (A) Esmarch bandage wrapped groin to toe
- (B) elastic bandages wrapped toe to groin
- (C) sequential compression devices
- (D) special tensor stockings (TED) stockings

12. Which of the following diseases CANNOT be treated by a sympathectomy?

- (A) Intractable nerve pain
- (B) Vascular extremity disorders
- (C) Hyperhidrosis
- (D) Neuroma

13. All of the following are used for hemostasis in a neurosurgical procedure EXCEPT

- (A) bone wax
- (B) compressed cotton strips
- (C) bipolar coagulation
- (D) monopolar coagulation

14. Upon craniotomy closure, the bone flap is sutured on with

- (A) stainless steel suture
- (B) silk
- (C) absorbable suture
- (D) nonabsorbable suture

15. Removal of an anterior cervical disc with accompanying spinal fusion is termed a

- (A) Schwartz procedure
- (B) Cloward procedure
- (C) Torkildsen operation
- (D) stereotactic procedure

16. In laminectomy, herniated disc fragments are removed with a

- (A) bayonet
- (B) Cloward punch
- (C) Scoville
- (D) pituitary rongeur

17. When using the perforator to create burr holes, heat is counteracted by

- (A) irrigating drill site as hole is drilled
- (B) surrounding the area with cool lap pads
- (C) dipping perforator in water
- (D) working quickly, stopping often

18. A ventriculoperitoneal shunt treats

- (A) Parkinson disease
- (B) hydrocephalus
- (C) Ménière disease
- (D) trigeminal neuralgia

19. The advantage of using a Javid Shunt during a carotid endarterectomy is

- (A) continuous cerebral blood flow
- (B) prevention of dislodging debris
- (C) ease in securing patch to artery
- (D) clearer view of surgical site

20. Neurosurgical sponges soaked in solution are placed within the reach of the surgeon and displayed on a/n

- (A) inverted emesis basin
- (B) dry sterile towel
- (C) plastic drape
- (D) Both A and C

21. All of the following statements are true about knee–chest positioning for laminectomy EXCEPT

- (A) decreased bleeding
- (B) better exposure of laminae

- (C) increased operating time
- (D) increased ease of ventilation

22. What is the most common congenital lesion encountered, requiring neurosurgical intervention?

- (A) Meningomyelocele
- (B) A-V malformation
- (C) Aneurysm
- (D) Neurofibromas

23. To effect hemostasis during a neurosurgical procedure, small pieces of Gelfoam are cut into several different sizes and soaked in

- (A) saline
- (B) Avitene
- (C) topical thrombin
- (D) hydrogen peroxide

24. What instrument is used to excise the laminae overlying the herniated disc during its removal in a laminectomy procedure?

- (A) Cloward
- (B) Leksell
- (C) Kerrison
- (D) Beckman–Adson

- 25.** Malabsorption of cerebrospinal fluid (CSF) and resultant hydrocephalus are corrected by a neurosurgical
- (A) VP shunt
 - (B) AV shunt
 - (C) VA shunt
 - (D) Both A and C
- 26.** Neurosurgical procedures done for the purpose of locating and destroying target structures in the brain are called
- (A) stereotactic
 - (B) cranioplasties
 - (C) craniosynostosis
 - (D) trigeminal rhizotomies
- 27.** What is the incisional approach used to effect a transsphenoidal hypophysectomy?
- (A) Middle of the upper gum
 - (B) Bifrontal approach
 - (C) Frontal approach
 - (D) Frontotemporal approach
- 28.** Dorsal sympathectomy entails removal of which of the following chains of the sympathetic division of the

autonomic nervous system?

- (A) Thoracolumbar
- (B) Cervicothoracic
- (C) Lumbar
- (D) Cervical

29. Which of the following is used to control bleeding around the spinal cord?

- (A) $4 \times 4s$
- (B) Thrombin
- (C) Cottonoid
- (D) Peanut

30. Which of the following meninges lies closest to the brain?

- (A) Dura mater
- (B) Pia mater
- (C) Arachnoid
- (D) Subarachnoid

31. What cranial nerve is responsible for the sense of smell?

- (A) I
- (B) II

- (C) III
- (D) IV

32. Diagnostic test used to measure electrical activity of the brain is

- (A) electrocardiogram
- (B) myelogram
- (C) electromyography
- (D) electroencephalogram

33. Imaging studies used to visualize the spinal cord are an MRI and _____.

- (A) myelography
- (B) electromyelography
- (C) ultrasound
- (D) discography

34. A fatal disease of the nervous system that is caused by a prion (infectious protein) which cannot be destroyed by normal disinfection and sterilization is

- (A) Parkinson disease
- (B) Creutzfeldt-Jakob disease
- (C) Meniere disease
- (D) hydrocephalus

35. Incomplete closure of the spine is

- (A) scoliosis
- (B) intervertebral disc disease
- (C) subdural hematoma
- (D) spina bifida

36. A slow growing tumor of the vestibular branch of the eighth cranial nerve is

- (A) acoustic neuroma
- (B) glioma
- (C) seizure disorder
- (D) meningioma

37. A type of malignant brain tumor is

- (A) meningioma
- (B) glioma
- (C) sacrococcygeal tumor
- (D) teratoma

38. What medication is used to prevent increased intracranial pressure and reduce cerebral or spinal edema?

- (A) Papaverine
- (B) Lidocaine

- (C) Mannitol
- (D) Topical thrombin

39. There are _____ cervical vertebrae.

- (A) 6
- (B) 7
- (C) 12
- (D) 4

40. The system controlling the “fight or flight” response of the body is

- (A) sympathetic
- (B) parasympathetic
- (C) autonomic
- (D) Both A and B

41. The most common site for a bone graft is

- (A) iliac crest
- (B) femur
- (C) vertebral spine
- (D) acetabulum

42. When performing a ventriculoperitoneal shunt, the catheter is placed in the _____ and _____.

- (A) Lateral ventricle, peritoneal cavity
- (B) Epidural space, peritoneal cavity
- (C) Third ventricle, subcutaneous space
- (D) Third ventricle, peritoneal cavity

43. What self-retaining retractor is used to maintain traction of brain tissue?

- (A) Craniotome
- (B) Raney
- (C) Gelpi
- (D) Yasargil

44. A gigli saw is used during a

- (A) laminectomy
- (B) Cloward
- (C) cordotomy
- (D) craniotomy

45. The following are types of brain tumors EXCEPT

- (A) meningioma
- (B) glioma
- (C) ependymoma
- (D) hematoma

46. During a craniotomy, a Penfield dissector or a

Woodson dissector are used to release the from _____ cranial bone.

- (A) dura mater
- (B) galia
- (C) rami
- (D) gyri

47. What type of bone is the cranium?

- (A) Irregular
- (B) Round
- (C) Sesamoid
- (D) Flat

48. During cranial surgery, the patient's hair is

- (A) discarded
- (B) sent to pathology
- (C) saved with the patient's chart
- (D) there is no standard procedure

Answers and Explanations

- 1. (D)** Hemostatic scalp clips include Michel, Raney, Adson, and LeRoy clips (Meeker and Rothrock).
- 2. (D)** Head and neck stabilization in a patient with a cervical fracture and/or dislocation is effected by use of Vinke or Crutchfield tongs for skeletal traction (Fortunato).
- 3. (C)** Cordotomy is division of the spinothalamic tract for the treatment of intractable pain (Meeker and Rothrock).
- 4. (D)** Burr holes are placed to remove a localized fluid collection beneath the dura mater in a subdural hematoma (Meeker and Rothrock).
- 5. (B)** Gelfoam is supplied in powder and also a compressed sponge. The sponge form can be applied to an oozing surface dry or saturated with saline solution or topical thrombin (Meeker and Rothrock).
- 6. (C)** Meningioma arises from the arachnoid space tissue, the middle covering of the brain. It is slow

growing and very vascular. Removal may be difficult (Meeker and Rothrock).

- 7. (C)** Cottonoid pledgets or strips or “patties” are used because they are gentler on the fragile tissue located here. They are counted items (Meeker and Rothrock).
- 8. (C)** A subdural hematoma, one that occurs between the dura and the arachnoid, is usually caused by a laceration of the veins that cross the subdural space (Fortunato).
- 9. (D)** Neurolysis is the freeing of an adhered nerve to restore function and relieve pain. Carpal tunnel syndrome is an example in which the median nerve is entrapped in the carpal tunnel of the wrist (Fortunato).
- 10. (A)** Cryosurgery utilizes subfreezing temperatures to create a lesion in the treatment of disease, such as Parkinson disease. This brain lesion destroys diseased cells of the brain and reduces the tremors associated with the disease (Meeker and Rothrock).
- 11. (A)** Preoperatively, elastic bandages (toe to groin), TED, or sequential compression stockings may be applied to help prevent venous stasis in lower extremities and also to help maintain blood pressure (Meeker and Rothrock).

- 12. (D)** Neuromas are frequently caused by retraction of nerve ends after trauma. The inability of regenerating axons to bridge the gap between both divided ends because of scar tissue requires that part of scar to be removed. This would not be accomplished by eliminating a neuropathway (Meeker and Rothrock).
- 13. (D)** Bipolar units are commonly used in neurosurgery. They provide a completely isolated output with negligible leakage of current between the tips of the forceps, permitting use of coagulation current in proximity to structures where ordinary unipolar coagulation would be hazardous (Meeker and Rothrock).
- 14. (A)** In craniotomy the bone flap may be anchored with stainless steel suture (Fortunato).
- 15. (B)** A Cloward procedure is done to relieve pain in the neck, shoulder, or arm caused by cervical spondylosis or herniated disc. It involves removal of the disc with fusion of the vertebral bodies (Meeker and Rothrock).
- 16. (D)** Herniated disc fragments are removed in laminectomy with a pituitary rongeur (Meeker and Rothrock).
- 17. (A)** A great deal of heat is generated by the friction of

the perforator against the bone. For this, irrigation of the drilling site counteracts the heat and removes bone dust (Meeker and Rothrock).

- 18. (B)** In hydrocephalus, there is an increase in CSF in the cranial cavity caused by excessive production, inadequate absorption, or obstruction of flow. The shunt procedures divert CSF from ventricles to other body cavities from which it is absorbed (Meeker and Rothrock).
- 19. (A)** The Javid or Argyle shunt, commonly used in carotid endarterectomy has as its main advantage continuous blood flow to the cerebrum during the surgery. It inhibits the surgeon's view during the surgery and during the repair (Meeker and Rothrock).
- 20. (D)** Neurosurgical sponges, thoroughly soaked with saline or Ringer's lactate solution may be displayed near the surgeon's hand on an inverted basin, plastic drape, Vi-drape, or a small bowl. A dry towel absorbs the solution before its use (Meeker and Rothrock).
- 21. (C)** All are advantages of the knee–chest position except the increase in operating room time. Knee–chest actually reduces operating time (Meeker and Rothrock).

- 22. (A)** The most common congenital lesion encountered is a lumbar meningocele or meningomyelocele. The fluid-filled, thin-walled sac often contains neural elements. Surgical correction is necessary when the sac wall is so thin that there is a potential or actual CSF leak (Meeker and Rothrock).
- 23. (C)** Gelfoam will be cut into assorted sizes and soaked in topical thrombin for placement on the brain (Meeker and Rothrock).
- 24. (C)** The edges of the laminae overlapping the interspace with a herniated disc are defined with a curette. A partial hemilaminectomy of these laminal edges extending out into the lateral gutter of the spinal canal is performed with a Kerrison rongeur (Meeker and Rothrock).
- 25. (D)** Hydrocephalus is a pathologic condition in which there is an increase in the amount of CSF in the cranial cavity because of inadequate absorption or obstruction through the ventricular system. Ventriculoatrial (VA) shunts and ventriculoperitoneal (VP) shunts are used for absorption of excess cerebrospinal fluid (Meeker and Rothrock).
- 26. (A)** The use of complex mechanisms to locate and destroy target structures in the brain is known as

stereotactics. Common target areas include obliterating tumors, aneurysms, abolishing movement disorders, and alleviating pain (Meeker and Rothrock).

27. (A) Bifrontal, frontal, and frontotemporal approaches are frequently used for removal or craniopharyngiomas, optic gliomas, and other suprasellar and parasellar tumors. A transsphenoidal hypophysectomy approaches the pituitary gland through the upper gum margin into the floor of the sella tunica (Meeker and Rothrock).

28. (B) Sympathetic denervation of the upper extremities and heart may be accomplished by cervicothoracic sympathectomy (dorsal). The vasospastic phenomenon of Raynaud disease is relieved by this procedure (Meeker and Rothrock).

29. (C) Cottonoids are small square felted sponges made of cotton or rayon. They are used to control bleeding on neuro and vascular tissues (Fuller).

30. (B) The meninges has three protective coverings. The outermost is the dura mater, the middle the arachnoid mater, and the pia mater is closest to the brain (Fuller).

- 31. (A)** Cranial nerve I is the olfactory nerve and is responsible for the sense of smell (Fuller).
- 32. (D)** Electroencephalogram (EEG) is the diagnostic test used to measure the electrical activity of the brain (Fuller).
- 33. (A)** Myelography uses contrast medium injected into the subarachnoid space of the cervical or lumbar spine and plane X-rays are taken to produce images (Fuller).
- 34. (B)** Creutzfeldt-Jakob disease is a disease of the nervous system that is caused by a prion, which cannot be destroyed by normal disinfection and sterilization. Recommendations include using disposable instruments, which are isolated and incinerated upon disposal (Fuller).
- 35. (D)** An incomplete closure of the spine is spina bifida (Fuller).
- 36. (A)** A slow growing tumor of the vestibular branch of the eighth cranial nerve is an acoustic neuroma. It is composed of Schwann cells. It is also known as a vestibular schwannoma (Fuller).
- 37. (B)** A glioma is a malignant tumor of the brain composed of glia cells (Fuller).

- 38. (C)** Mannitol acts on the kidneys to remove fluid from the tissues (Fuller).
- 39. (B)** There are 7 cervical vertebrae (Fuller).
- 40. (A)** The sympathetic system controls thermoregulation, heart rate, peristalsis, and vascular constriction or dilation (Fuller).
- 41. (A)** The iliac crest is the most common bone grafting donor site (Fuller).
- 42. (A)** The ventriculoperitoneal is placed through a burr hole into the lateral ventricle and the peritoneal cavity (Fuller).
- 43. (D)** A self-retaining retractor used to maintain traction of brain tissue is a Yasargil (Fuller).
- 44. (D)** During a craniotomy, burr holes are connected with a craniotome or a gigli saw (Fuller).
- 45. (D)** A hematoma is a collection of blood in the tissue (Fuller).
- 46. (A)** A Penfield dissector or a Woodson dissector are used to release the dura mater from the cranial bone (Fuller).

47. (D) The ribs, cranial bones, scapula and sternum are examples of flat bones (Fuller).

48. (C) The patient's hair is personal property and should be shaved and sent with the patient's chart (Fuller).

CHAPTER 30

Pediatric Surgery

Questions

- 1.** The telescoping of the proximal intestine into the lumen of the distal intestine is called

 - (A) volvulus
 - (B) intussusception
 - (C) pyloric stenosis
 - (D) ileal atresia
- 2.** An imperforation or closure of a normal opening is called a/n

 - (A) hypertrophy
 - (B) atresia
 - (C) stenosis
 - (D) atrophy
- 3.** Failure of the intestines to encapsulate within the peritoneal cavity of a newborn is called

 - (A) umbilical hernia
 - (B) omphalocele
 - (C) hydrocele

(D) intestinal extrophy

4. A congenital malformation of the chest wall with a pronounced funnel-shaped depression is called

- (A) truncus arteriosus
- (B) pectus excavatum
- (C) pectus carinatum
- (D) costochondral separation

5. Newborn vomiting, free of bile and projectile in nature, is indicative of

- (A) atresia of the esophagus
- (B) pyloric stenosis
- (C) volvulus
- (D) intussusception

6. The surgical pediatric patient with an increased metabolic rate requires all of the following EXCEPT

- (A) oxygen
- (B) caloric intake
- (C) blood transfusions
- (D) fluids

7. Hirschsprung disease is synonymous with

- (A) bowel obstruction
- (B) malrotation
- (C) ileal stenosis
- (D) Meckel diverticulum

8. The condition evidenced by incomplete closure of the vertebral arches in newborns is

- (A) hydrocephalus
- (B) encephalocele
- (C) spina bifida
- (D) myelomeningocele

9. The condition involving premature closure of infant cranial suture lines is referred to as

- (A) cranioplasty
- (B) stereotactic surgery
- (C) craniosynostosis
- (D) transsphenoidal hypophysectomy

10. An imperforate anus means

- (A) anal opening is absent
- (B) anus is closed
- (C) anal sphincter is too tight
- (D) anal sphincter is too loose

- 11.** A Wilms' tumor, the most common intraabdominal childhood tumor is known as a/n
- (A) nephroblastoma
 - (B) neuroblastoma
 - (C) aganglionic colon
 - (D) intussusception
- 12.** Nonclosure at birth of the duct that carries blood from the pulmonary artery directly to the aorta is termed
- (A) tetralogy of Fallot
 - (B) coarctation of the aorta
 - (C) patent ductus arteriosus
 - (D) anomalous venous return
- 13.** The most common congenital cardiac anomaly in the cyanotic group is
- (A) tricuspid atresia
 - (B) tetralogy of Fallot
 - (C) patent ductus arteriosus
 - (D) truncus arteriosus
- 14.** The mechanical strength of a weak eye muscle due to strabismus in a pediatric patient can be corrected by all of the following EXCEPT

- (A) tucking
- (B) advancement
- (C) recession
- (D) resection

15. What surgery is performed to treat otitis media?

- (A) Myringotomy
- (B) Adenoidectomy
- (C) Tympanoplasty
- (D) Tonsillectomy

16. What problem is most commonly seen in the pediatric postoperative patient?

- (A) Hypotension
- (B) Airway impairment
- (C) Hypothermia
- (D) Metabolic depression

17. During surgery on the pediatric patient, interventions to maintain the patient's temperature are

- (A) the OR is prewarmed prior to the patient arriving
- (B) a warm air blanket is used during procedure
- (C) heating lamps are used preoperatively or at anytime needed
- (D) All of the above

18. Pediatric medications are prescribed according to the patients weight in

- (A) kilograms
- (B) pounds
- (C) grams
- (D) neograms

19. What procedure is performed to reconstruct the external ear?

- (A) Rotation flap
- (B) Lobularplasty
- (C) External auditory fixation
- (D) Otoplasty

20. The procedure performed to open a stricture at the gastric outlet on an infant is

- (A) gastrectomy
- (B) pyloral myotomy
- (C) pyloric stenting
- (D) Ramstedt

21. Intestinal obstruction by twisting of the intestines is

- (A) pyloric stenosis
- (B) volvulus

- (C) neuroblastoma
- (D) encephalocele

22. Orchiopexy is performed to treat

- (A) testicular cancer
- (B) torsion of the testicle
- (C) congenital undescended testicle
- (D) Both B and C

23. The most common defects that occur when the embryonic development of the central nervous system (spinal cord and brain) fail to close completely is spina bifida, anencephaly, and encephalocele. This condition is called

- (A) tetralogy of Fallot
- (B) ventricular septal defect
- (C) vertebral recession
- (D) neural defect

24. A medical term used for the condition characterized by fusion of the fingers and toes is

- (A) club hand and foot
- (B) syndactyle
- (C) mermaid syndrome
- (D) trigger finger

25. An untreated condition in infants that causes the skull to enlarge is called

- (A) hydrocephalus
- (B) cerebral defect
- (C) cerebral aneurysm
- (D) meningioma

26. A ventricular atrial shunt, a ventricular peritoneal shunt, and an in vitro shunt are performed for the condition called

- (A) decompression of the cranial nerves
- (B) hydrocephalus
- (C) cranial neuroma
- (D) intracranial aneurysm

Answers and Explanations

- 1. (B)** Intussusception is the telescopic invagination of a portion of intestine into an adjacent part with mechanical and vascular impairment frequently at ileocecal junction (Meeker and Rothrock).
- 2. (B)** Atresia is an imperforation or closure of an opening. Atresia and stenosis (a narrowing of an opening) are the most common causes of obstruction in a newborn (Meeker and Rothrock; Tortora and Grabowski).
- 3. (B)** Failure of the intestines to become encapsulated within the peritoneal cavity during fetal development results in herniation through a midline defect in the abdominal wall at the umbilicus. This is termed omphalocele (Meeker and Rothrock).
- 4. (B)** A congenital malformation of the chest wall, pectus excavatum, is characterized by a pronounced funnel-shaped depression over the lower end of the sternum (Meeker and Rothrock).
- 5. (B)** The first sign of pyloric stenosis is projectile

vomiting free of bile. The surgical procedure for repair is a pyloromyotomy. The muscles of the pylorus are incised to relieve the stenosis (Meeker and Rothrock).

- 6. (C)** Oxygen, calories, and fluids must be increased because of the increased demands of surgical stress. Blood is not given unless there is a need (Meeker and Rothrock).
- 7. (A)** The goal for hirschsprungs is resection and reconstruction of the distal colon to restore functional peristalsis and to prevent a further bowel obstruction. The diagnosis is confirmed with a rectal biopsy (Fuller).
- 8. (C)** A newborn anomaly that is evidenced by incomplete closure of the vertebral arches, with or without herniation of the meninges, is called spina bifida (Tortora and Grabowski).
- 9. (C)** In craniosynostosis, the suture line of an infant has closed prematurely. A synthetic material (such as silicone) is used to keep the edges of the cranial sutures from reuniting and preventing brain growth (Meeker and Rothrock).
- 10. (B)** In imperforate anus, the anus remains closed

during fetal development and must be opened soon after birth (Fortunato).

- 11. (A)** A Wilms tumor, also known as nephroblastoma, is the most common intra-abdominal childhood tumor. It presents as a painless mass whose enlargement may laterally distend the abdomen (Meeker and Rothrock).
- 12. (C)** During fetal life, the ductus arteriosus carries blood from the pulmonary artery to the aorta, bypassing the lungs. After birth, this duct closes in the first hours. Nonclosure is termed patent ductus arteriosus and requires surgical closure (Fortunato).
- 13. (B)** Tetralogy of Fallot is the most common congenital cardiac anomaly in the cyanotic group. It is the result of shunting unoxygenated blood into the systemic circulation (Meeker and Rothrock).
- 14. (C)** Recession is a procedure done for strabismus where the muscle is overactive. All other procedures listed deal with the underactive (weak) eye muscle (Meeker and Rothrock).
- 15. (A)** Secretory otitis media is the most common chronic condition of childhood. Fluid accumulates in the middle ear from eustachian tube obstruction. This condition is corrected by myringotomy, an incision in

the tympanic membrane (Fortunato).

- 16. (B)** Airway problems are the most common concern on emergence from surgery and immediately postoperative. At the conclusion of the operation, the oropharynx and stomach are suctioned. All monitors are left in place until the patient is fully awake and extubated (Fortunato).
- 17. (D)** The methods used to maintain a pediatric temperature include prewarming the OR, a warm water filled blanket, heat lamps, a solution warmer, warm IV solution, and prewarmed surgical sponges (Fuller).
- 18. (A)** The patient's weight is measured in kilograms (Fuller).
- 19. (D)** Otoplasty is performed to reconstruct the external ear after trauma or to correct protruding ears (Fuller).
- 20. (B)** Pyloral myotomy is surgery to correct an infantile hypertrophic pyloric stenosis (Fuller).
- 21. (B)** A volvulus is a rotation of the intestine around itself or the attached mesentery (Fuller).
- 22. (C)** The goal of surgery for the undescended testicle is to restore the testicle to its normal position in the

scrotum (Fuller).

- 23. (D)** The neural tube is an embryonic structure that gives rise to the nervous system. Defects in this neural tube occur when this tube fails to close completely (Fuller).
- 24. (B)** Syndactyle is a congenital condition in which the digits of the hand and or feet are joined from birth (Fuller).
- 25. (A)** Hydrocephalus occurs when the flow of cerebrospinal fluid (CSF) is blocked or obstructed. There becomes an increased amount of fluid in the ventricles of the brain (Fuller, 4th ed.).
- 26. (B)** All three shunts are performed for hydro-cephalus. Ventricular atrial is from the ventricle to the atrium, ventricular peritoneal is ventricle to the peritoneal cavity, and the in vitro shunt is done while the fetus is in vitro (Fuller, 4th ed.).

CHAPTER 31

Emergency Procedures

Questions

- 1.** An emergency drug useful in ventricular fibrillation or tachycardia is

 - (A) Aramine
 - (B) atropine
 - (C) Inderal
 - (D) calcium chloride
- 2.** An emergency drug that increases myocardial contractility is

 - (A) calcium chloride
 - (B) Levophed
 - (C) Lasix
 - (D) Isuprel
- 3.** The action of sodium bicarbonate in an advanced life support effort is to

 - (A) stimulate the heart muscle
 - (B) strengthen and slow heartbeat
 - (C) reduce ventricular excitement

(D) counteract metabolic acidosis

4. Xylocaine is used intravenously for

- (A) installation of local anesthesia
- (B) treatment of cardiac arrhythmias
- (C) diuretic action
- (D) restoration of blood volume

5. If cardiac arrest occurs in the OR, who is responsible for handling artificial ventilation?

- (A) The anesthesiologist
- (B) The circulating nurse
- (C) The surgeon
- (D) The scrub nurse

6. Sudden shortness of breath in a postoperative patient may be indicative of

- (A) pulmonary embolism
- (B) pleural effusion
- (C) emphysema
- (D) asthma

7. Which pulse is checked during a cardiac arrest effort?

- (A) Radial

- (B) Carotid
- (C) Pedal
- (D) Brachial

8. Airways should be

- (A) removed before the patient leaves the OR site
- (B) left in until the patient is fully awake and ready to return to his or her room
- (C) left in place until the patient breathes normally
- (D) removed only by the anesthesiologist

9. An anesthetic complication characterized by progressive elevation of body temperature is known as malignant

- (A) hypothermia
- (B) hypervolemia
- (C) hypersalemia
- (D) hyperthermia

10. All of the following are results from aspiration of gastric contents during anesthesia EXCEPT

- (A) impeded blood gas exchange
- (B) impaired lung function
- (C) gastric decompression
- (D) chemical pneumonitis

11. A telethermometer monitors the body temperature during surgery. It can be placed in all of the following areas EXCEPT the

- (A) rectum
- (B) esophagus
- (C) axilla
- (D) tympanic area

12. Dark blood in the operative field may indicate that the patient is

- (A) hyperkalemic
- (B) hypovolemic
- (C) hypotensive
- (D) hypoxic

13. The first and most important step for successful resuscitation in cardiac arrest is

- (A) the precordial thump
- (B) artificial ventilation
- (C) immediate opening of the airway
- (D) external cardiac compression

14. The responsibility of the scrub nurse in cardiopulmonary resuscitation (CPR) is to

- (A) bring in the emergency cart
- (B) keep a record of all medication given
- (C) help with the intravenous and monitoring lines
- (D) give attention to the sterile field and the surgeon's needs

15. A safety precaution used when a patient is being shocked with the defibrillator is

- (A) no one is to touch the patient or anything metallic in contact with the patient
- (B) available personnel gently but firmly support the extremities to protect the patient from injury
- (C) the person holding the electrodes does not touch the patient but anyone else can
- (D) the person holding the electrodes is the only one who may touch the patient

16. When handing a syringe of medication to the surgeon for a local anesthetic, the scrub nurse should

- (A) ask the circulating nurse what solution he or she has
- (B) ask the circulator to show the vial to the surgeon
- (C) show the surgeon the vial that it came from
- (D) state the kind and percentage of the solution

17. When cardiac arrest occurs, resuscitative measures

must begin within

- (A) 2 minutes
- (B) 3–5 minutes
- (C) 2–7 minutes
- (D) 5–8 minutes

18. Who is responsible for recording all medications given during CPR in the OR?

- (A) The scrub nurse
- (B) The circulating nurse
- (C) The anesthesiologist
- (D) The surgeon's assistant

19. CPR is instituted if

- (A) the pulse is below 60, respirations are diminished, and blood pressure is dropping
- (B) there is no pulse or blood pressure, and the pupils contract
- (C) there is no pulse, respiration, or blood pressure, and the pupils are fixed and dilated
- (D) the pulse is weak and irregular, blood pressure is lowered, and pupils are dilated

20. The first action to be taken in the event of a cardiac arrest in the OR is to

- (A) alert the OR supervisor and personnel
- (B) prepare medications
- (C) institute chest massage
- (D) apply fibrillator paddles

21. Intraoperative and postoperative emergency procedures require the scrub person to

- (A) immediately intervene with patient care
- (B) attend the anesthesiologist during crisis
- (C) maintain sterile Mayo with instruments
- (D) Both A and B

Answers and Explanations

- 1. (C)** Propranolol hydrochloride (Inderal) is useful in ventricular fibrillations or tachycardia. It is hazardous when cardiac function is depressed. It is also used in treating hypertension (Fortunato).
- 2. (A)** Calcium chloride is useful in profound cardiovascular collapse. It increases myocardial contractility, enhances ventricular excitability, and prolongs systole. Calcium cannot be given together with sodium bicarbonate because a precipitate forms from the mixture (Fortunato).
- 3. (D)** Sodium bicarbonate counteracts metabolic acidosis generated during time without oxygen. It elevates the pH of the blood. It restores the bicarbonate ion (Fortunato).
- 4. (B)** Lidocaine (Xylocaine) is used intravenously for treatment of cardiac arrhythmias, particularly, ventricular in nature. It is used before, during, and after cardiac procedures, in cardiac arrest, and in treatment and prevention of irritability in myocardial infarct (Fortunato).

- 5. (A)** When a cardiac arrest occurs in the OR, the anesthesiologist handles the artificial respiration. He or she may already have an endotracheal tube in place or in an airway (Fortunato).
- 6. (A)** Pulmonary embolus is an obstruction of one or more of the pulmonary arteries by a thrombus that becomes dislodged and is carried to the lung. This may be accompanied by sudden substernal pain, rapid and weak pulse, shock, syncope, and sudden death. It is often associated with advanced age and postoperative states (Fortunato).
- 7. (B)** The carotid pulse is palpated in CPR. The carotid arises from the aorta. It is the principal blood supply to the head and neck and is palpable in the neck (Fortunato).
- 8. (C)** Often the anesthesiologist leaves a hard rubber or plastic airway in the mouth. This should remain in place until the patient recovers sufficiently to breathe normally. It should not be removed until the patient expresses a desire to have it removed (Fortunato).
- 9. (D)** Malignant hyperthermia is an often fatal complication, characterized by progressive elevation of the body temperature monitored as high as 109°F. It occurs most often during general anesthesia, and its

exact cause is unknown. If untreated, it can result in cardiovascular collapse (Fortunato).

- 10. (C)** Aspiration of gastric contents into the lungs may occur during throat reflexes when the patient is unconscious, or in conscious patients when the throat is anesthetized, as in bronchoscopy. Residual effects are impaired lung function and blood gas exchange, pneumonitis, atelectasis, and lung abscesses (Fortunato).
- 11. (C)** The telethermometer monitors the body temperature during an operation. It is electronic, connects to a probe, and provides direct temperature readouts on a dial. Rectal, esophageal, or tympanic probes are used. This is frequently used in pediatric surgery (Fortunato).
- 12. (D)** Hypoxia is lack of adequate amounts of oxygen; if prolonged, it can result in cardiac arrhythmia or irreversible brain, liver, kidney, and heart damage. The treatment is immediate adequate oxygen intake to stimulate the medullary centers and prevent respiratory system failure. Dark blood on the operative field is a symptom of hypoxia (Fortunato).
- 13. (C)** Immediate opening of the airway is the most important factor for successful resuscitation. The back

of the tongue is the most common obstruction. Because the tongue is attached to the lower jaw, moving the jaw forward lifts the tongue from the back of the throat and opens the airway (Fortunato).

- 14. (D)** The scrub nurse should pay attention to the field and the surgeon's needs. The scrub nurse should also keep syringes of medications filled and ready for use, keep track of sponges, and be prepared to close the wound rapidly. If arrest occurs during the operation, the wound is packed and the patient repositioned for CPR (Fortunato).
- 15. (A)** When using the defibrillator, neither the person holding the electrodes nor anyone else may touch the patient or anything metallic that is in contact with the patient. This is done to prevent self-electrocution. No part of the operator's body should touch the paste or insulated electrodes (Fortunato).
- 16. (D)** When handing a syringe with a local anesthetic to the surgeon, the scrub nurse should state the kind and percentage of the solution. This action prevents errors (Fortunato).
- 17. (B)** Resuscitative measures must be instituted immediately (within 3–5 minutes) to prevent irreversible brain damage. Time of arrest should be

noted. A clock should be started to check time lapse (Fortunato).

18. (B) It is the circulating nurse's responsibility to keep a record of all medications given, including the time and the amount. One person, usually the anesthesiologist, commands the effort with support from others (Fortunato).

19. (C) The patient is in cardiopulmonary arrest if there is no pulse, respiration, or blood pressure and the pupils are dilated. If unconscious, check airway; if not breathing, check resuscitation; if there is no pulse and pupils are dilated, massage heart (Fortunato).

20. (A) Most hospitals are equipped with a special code switch or foot pedal that sets off an alarm indicating an arrest in the room in which it occurs. Within seconds, additional personnel will be available to aid in resuscitation efforts (Fortunato).

21. (C) Hospital policy usually requires that a Mayo stand remain sterile until the patient has left the room. This may provide a field and instruments for surgical intervention if a crisis occurs (Fortunato).

SECTION VI

Technology in the Operating Room

CHAPTER 32

Computers

Questions

- 1.** Located on the back of the CPU are special openings called _____ for plugging in cables for adding additional computer components.

 - (A) drives
 - (B) cords
 - (C) ports
 - (D) networks
- 2.** The device that enables a computer to send and receive information by phone line is called a

 - (A) modem
 - (B) scanner
 - (C) USB port
 - (D) lateral port
- 3.** Visual display on the desktop of shortcuts to available programs are called

 - (A) topics
 - (B) windows

- (C) displays
- (D) icons

4. When open to the Internet, what function can be used to return to a recently opened site that you have not saved on your computer?

- (A) Search
- (B) History
- (C) Favorites
- (D) Address book

5. Web research is generally conducted with the help of

- (A) cursors
- (B) search engines
- (C) browser
- (D) instant access

6. A product used to buffer the computer hardware against high electrical voltages is called a

- (A) zip drive
- (B) surge protector
- (C) modem
- (D) lateral port

7. A hardware component that converts printed text or

picture to digital information for use in documents is called the

- (A) scanner
- (B) printer
- (C) modem
- (D) Ethernet card

8. The arrow or small hand, which appears on the screen to identify the location of currently addressed information is known as a

- (A) scanner
- (B) cursor
- (C) icon
- (D) taskbar

9. The component part of the computer that controls the cursor is called the

- (A) scroller
- (B) mouse
- (C) index
- (D) scanner

10. The paper form of data in computer technology is the

- (A) file

(B) hard copy

(C) disc

(D) database

Answers and Explanations

- 1. (C)** Located at the back of the computer are ports that allow us to access a connection to the hard drive to attach scanners, printer, and other components to the system (Frey and Price).
- 2. (A)** A modem is the communication device that sends and receives information over a telephone line, thereby, connecting us to the Internet (Frey and Price).
- 3. (D)** Icons that appear on the desktop screen are shortcuts to programs that also can be accessed through the start menu (Frey and Price).
- 4. (B)** The computer holds the most recently visited sites in a history menu. Clicking on history will return the site to the screen for viewing (Frey and Price).
- 5. (B)** There are several search engines available to reach the web—for example, Google, Alta Vista, and Yahoo (Frey and Price).
- 6. (B)** A surge protector is a buffer against damaging high voltage surges of energy (Frey and Price).

- 7. (A)** A scanner resembles a printer, but reproduces the image electronically rather than duplicating the print (Frey and Price).
- 8. (B)** The cursor is a small arrow that appears on the screen to identify the information to be addressed (Frey and Price).
- 9. (B)** The mouse moves the cursor to different areas on the screen and selects commands (Frey and Price).
- 10. (B)** The hard copy of data is a paper printout of the data and this is another method of protecting work (Fuller).

CHAPTER 33

Surgical Applications of Electricity

Questions

1. Anything that has mass and occupies space is termed

- (A) element
- (B) matter
- (C) conductor
- (D) insulator

2. The center of an atom is called the

- (A) matter
- (B) mass
- (C) nucleus
- (D) charge

3. The movement of electrical charge through a conductor is called

- (A) migration
- (B) electrical current
- (C) conduct
- (D) insulation

4. An ESU unit used in the operating room (OR) completes an electric circuit by carrying the current from the machine to the patient by way of the

- (A) inactive electrode
- (B) active electrode
- (C) ground pad
- (D) patient plate

5. Current is measured in

- (A) volts
- (B) amps
- (C) circuits
- (D) loads

6. The path which electricity travels from its energy source and back again is called

- (A) resistor
- (B) circuit
- (C) conductor
- (D) ampere

7. Restriction of the flow of current to a source is called

- (A) magnetism
- (B) resistance

- (C) force field
- (D) power

8. In a simple electrical circuit, the wire that connects to the switch is

- (A) neutral
- (B) ground
- (C) hot
- (D) None of the above

9. A separate wire that is an essential protection against an electric shock is

- (A) hot
- (B) neutral
- (C) ground
- (D) active

10. Most outlets in the operating room run on

- (A) 220 V
- (B) 110 V
- (C) 120 V
- (D) 60 V

11. When current moves in one direction and then reverses to return to the source, it is known as

- (A) alternating current
- (B) electrical current
- (C) direct current
- (D) optional current

12. One example of DC (direct current) is

- (A) an electrosurgical unit
- (B) a flashlight
- (C) a surgical room light
- (D) an X-ray machine

13. Alternating current has the ability to

- (A) step down voltage
- (B) step up voltage
- (C) alternate voltage
- (D) All of the above

14. A device that transmits an impulse to a wave-transmitting system is

- (A) an optical fiber
- (B) a radio transmitter
- (C) an isolated circuit
- (D) a resistor

15. An ESU used for delicate surgery is a

- (A) monopolar unit
- (B) disposable unit
- (C) bipolar unit
- (D) dispersive electrode unit

16. A plume of vaporized tissue may contain residual _____ and is, therefore, important to protect the staff.

- (A) carcinogens
- (B) blood-borne pathogens
- (C) mutagens
- (D) All of the above

17. An AC (alternating current) cycle is termed a

- (A) wave
- (B) volt
- (C) amp
- (D) hertz

18. Radio waves are considered _____ waves.

- (A) isolated
- (B) direct
- (C) simple

(D) magnetic

19. When current passes from the ESU through the active electrode, the energy is converted from electrical to _____.

(A) mechanical

(B) chemical

(C) thermal

(D) magnetic

20. What material forms the best conductor of electricity?

(A) Rubber

(B) Saltwater

(C) Copper

(D) Lead

21. What device is used to control the flow of electricity at the will of the operator?

(A) Load

(B) Resistor

(C) Switch

(D) Conductor

22. When operating a piece of electrical OR equipment, the most vital prong for safety purposes is the

- (A) ground
- (B) negative
- (C) positive
- (D) safety

23. Which theory explains the flow of electricity?

- (A) Ohm's
- (B) Electron
- (C) Kirchhoff's
- (D) Atomic

24. The standard metric unit of power is

- (A) amp
- (B) volt
- (C) watt
- (D) hertz

25. A medical imaging technique that reveals the body's dynamic activities is

- (A) CT
- (B) PET
- (C) tomogram
- (D) ultrasound

26. Electrosurgery can be used to

- (A) incise tissue
- (B) coagulate blood vessels
- (C) destroy or remove diseased tissue
- (D) All of the above

27. The proper placement of the patient return electrode or grounding pad should be

- (A) on the surgical side
- (B) farthest from the surgical site
- (C) near a bony surface
- (D) always on the opposite side

28. Forceps or an instrument that contains two contact points which are used to coagulate tissue are called

- (A) monopolar
- (B) Ferris-Smith
- (C) bipolar
- (D) Potts forcep

29. Which of the following can be used as a cutting electrode?

- (A) Needle tip
- (B) Spatula

- (C) Wire loop
- (D) All of the above

30. When using the ESU for coagulation, the energy delivered is

- (A) intermittent waves at a low frequency and high voltage
- (B) intermittent waves at a low frequency and low voltage
- (C) intermediate frequency and intermediate high voltage
- (D) intermediate waves and low voltage

31. Who is ultimately responsible for abiding by all safety protocols during the use of electro-surgery?

- (A) Surgeon
- (B) Circulator
- (C) STSR
- (D) All perioperative personnel

32. What is the sterile component used with the electrosurgical unit?

- (A) Grounding pad
- (B) Patient return electrode
- (C) Active electrode

(D) Generator

33. The tips of the active electrodes used in minimally invasive surgery (MIS) are coated with insulation to prevent

- (A) glare coming off the metal instrument
- (B) keeping the metal portion of the instrument clean
- (C) to prevent patient from being burned
- (D) None of the above

34. Sealing vessels with electrosurgery requires

- (A) high frequency
- (B) bipolar ESU instrument
- (C) physical pressure to create a weld in tissue
- (D) All of the above

35. What type of energy is used with the harmonic system? (harmonic scalpel, forceps, scissors)

- (A) Ultrasonic
- (B) Radiofrequency
- (C) Fulgaration
- (D) Monopolar

Answers and Explanations

- 1. (B)** Matter is anything that has mass and occupies space. All matter consists of atoms, and all atoms contain protons, neutrons, and electrons (Frey and Price).
- 2. (C)** The center of an atom contains the nucleus, which contains in its center, protons and neutrons (Frey and Price).
- 3. (B)** The electrical current moves through conductors by movement of free electrons (Frey and Price).
- 4. (B)** The active electrode carries the energy to the patient, goes through the ground pad on the patient into the inactive cord and back to the machine (Frey and Price).
- 5. (B)** Current is measured in amperes (amps) (Frey and Price).
- 6. (B)** The path of electricity from energy source to the piece of equipment and back again is called a circuit (Frey and Price).

- 7. (B)** Restriction of the flow of current to a source is called resistance (Frey and Price).
- 8. (C)** In a simple electric circuit, the wire that connects to the switch is hot (Frey and Price).
- 9. (C)** A separate wire that is essential protection against electric shock is the ground wire (Frey and Price).
- 10. (B)** Most outlets in the operating room run on 110 V current. X-ray units require the use of 220 V lines (Frey and Price).
- 11. (A)** Alternating current (AC) describes the flow of current that reverses direction periodically. Direct current (DC) indicates current that flows in only one direction (eg, a flashlight) (Frey and Price).
- 12. (B)** A flashlight is an example of one-way current or direct current (Frey and Price).
- 13. (D)** Alternating current has the ability to step-down, step-up, or alternate voltage continuously. Hospitals use a reduced current (Frey and Price).
- 14. (B)** A device called a radio transmitter carries an impulse or signal to a wave-transmitting antennae system (Frey and Price).

- 15. (C)** The unit used to perform electrosurgery in delicate areas, such as ophthalmology, plastic, and neurosurgery is the bipolar unit. It has reduced power. The circuit is completed within the handpiece (Frey and Price).
- 16. (D)** Certain surgical procedures than employ the use of electrocautery, laser, and drills can produce a plume of vaporized tissue that may include carcinogens, blood-borne pathogens, and mutagens. Smoke evacuators are frequently used to remove the potentially hazardous smoke (Frey and Price).
- 17. (D)** An alternating current cycle is a hertz. The number of cycles per second is a frequency (Frey and Price).
- 18. (D)** Radio waves are magnetic waves. The number of wave cycles is also called a frequency (Frey and Price).
- 19. (C)** When electrical current passes through the active electrode, it converts electrical energy to thermal (Frey and Price).
- 20. (C)** The best conductor of electricity is copper. Examples that use copper wire as a conductor in the OR are surgical lamps, electrosurgical units, and

power drills (Frey and Price).

- 21. (C)** A simple electrical circuit is composed of a source of power, conductor, load, and switch. The switch allows the operator to turn the piece of equipment on and off (Frey and Price).
- 22. (A)** When operating a piece of equipment in the OR, the most important prong is the ground. It safely transfers any leaking electrons to the ground and prevents injury (Frey and Price).
- 23. (A)** The scientific theory that explains electricity is Ohm's Law. It is a mathematical equation that shows the relationship between voltage, current, and resistance (Frey and Price).
- 24. (C)** Power is defined as the rate at which work is done. Power is measured in watts (Frey and Price).
- 25. (B)** Positron emission tomography (PET) is the medical imaging of dynamic activities in the body such as blood flow and glucose uptake in tissues (Frey and Price).
- 26. (D)** The most common uses of electrosurgery are all of the above including welding tissue together (Fuller, 5th ed.).

- 27. (A)** The PRE should always be placed close to the surgical site over a large muscle mass, never over a bony surface, scar, tattoo, hair, or implants. These increase impedance and can cause burns (Fuller, 5th ed.).
- 28. (C)** In bipolar electrosurgery, the surgeon uses a forcep or an instrument that has two contact points or a return point built into a single tip. The current leaves the power unit and travels from one pole to the other passing only through the tissue between the contact points. Current goes back to the ESU unit and no grounding pad is required (Fuller, 4th ed.).
- 29. (D)** The needle tip, spatula, and wire loops are all cutting electrodes (Fuller, 4th ed.).
- 30. (A)** When using the coagulation mode of an ESU, the energy delivered is intermittent waves at a low frequency and a high voltage. High-frequency waves at a low voltage is used for the cutting mode (Fuller, 4th ed.).
- 31. (D)** All perioperative personnel are responsible for preventing accidents involved with electro-surgery (Fuller, 4th ed.).
- 32. (C)** Active electrode or cautery pencil is the sterile

component. Grounding pad and the patient return electrode are the same. They are placed on the patient before surgery begins, and the generator is the power source (Fuller, 5th ed.).

33. (C) Insulators such as Teflon, silicone, polyethylene, and polyvinyl are used to protect the patient from being burned by stray electricity (Fuller, 5th ed.).

34. (D) Examples of electrosurgical vessel sealing are Ligasure and Enseal. This system is used during resection procedures that traditionally require sequential clamping, suturing and a cutting process (Fuller, 5th ed.).

35. (A) The harmonic energy system uses ultrasonic energy. This energy is generated by high-frequency vibration and friction. It simultaneously cuts and coagulates tissue by transmitting ultrasonic wave energy through specially designed forceps and scissors (Fuller, 5th ed.).

CHAPTER 34

Physics and Medicine

Questions

1. Motion is known as _____ energy.

- (A) mechanical
- (B) total
- (C) potential
- (D) kinetic

2. The rate at which work is done is known as

- (A) velocity
- (B) energy
- (C) power
- (D) watt

3. _____ borders the outer perimeter of an atom and is _____ charged.

- (A) Neutron, positively
- (B) Electron, negatively
- (C) Electron, positively
- (D) Proton, negatively

4. The gain or loss of electrons in an atom is termed

- (A) hydraulic pressure
- (B) Boyle's Law
- (C) ionization
- (D) consolidation

5. The transfer of thermal energy by contact is called

- (A) greenhouse effect
- (B) radiation
- (C) convection
- (D) conduction

6. A repeated periodic disturbance or variation of energy, carried through a medium from point to point is called

- (A) transfer energy
- (B) wave
- (C) oscillations
- (D) molecular change

7. The frequency of sound is stated in a measurement of

- (A) amps
- (B) hertz
- (C) waves
- (D) compressions

8. The study of objects in motion is

- (A) mechanics
- (B) velocity
- (C) speed
- (D) acceleration

9. The three laws of motion that are the basics of classical mechanics are the work of

- (A) Hooke
- (B) Newton
- (C) Bohr
- (D) Ohm

10. Any time that an object's velocity is changing, we say it is

- (A) accelerating
- (B) projecting
- (C) orbiting
- (D) static

11. The property of matter that causes a matter to resist change in motion is called

- (A) speed
- (B) inertia

- (C) momentum
- (D) range

12. For every action there is an equal and opposite reaction references _____

- (A) Newton's first law
- (B) Newton's second law
- (C) Newton's third law
- (D) Hooke's law

13. If an object returns to its original position after force has been applied and then removed is said to be

- (A) dynamic
- (B) static
- (C) elastic
- (D) periodic

14. The maximum distance that an object moves from its central position (equilibrium) is called

- (A) frequency
- (B) amplitude
- (C) cycle
- (D) momentum

15. The bending of a light ray as it passes from one

substance to another is called

- (A) reflection
- (B) refraction
- (C) vibration
- (D) incidence

16. What scientist, expanding Hooke's wave theory, theorized that light can bend because it is a wave?

- (A) Ohm
- (B) Einstein
- (C) Newton
- (D) Young

17. The longer wavelengths of the color spectrum are seen in what color?

- (A) Violet
- (B) Green
- (C) Blue
- (D) Red

18. Who first identified a collection of particles of light as "photons"?

- (A) Einstein
- (B) Newton

- (C) Bohr
- (D) Young

19. On the surface of the Earth, what causes objects to accelerate downward?

- (A) Energy
- (B) Excitation
- (C) Gravity
- (D) Electrical charges

20. What laser has the most power output?

- (A) Liquid
- (B) Semiconductor
- (C) Gas
- (D) Solid state

21. The fourth force found only in nature, and not in the nucleus, is known as

- (A) electromagnetic force
- (B) gravitational force
- (C) binding energy
- (D) kinetic energy

22. Nucleons are composed of subatomic particles known as

- (A) isotopes
- (B) quarks
- (C) protons
- (D) neutrons

23. All of the following are true of lasers EXCEPT

- (A) LASER is an acronym for light amplification by stimulated emission of radiation
- (B) electricity does pass through the patient during laser surgery
- (C) laser surgery uses intensely hot, precisely focused beams of light to cut and coagulate tissue
- (D) electricity does not pass through the patient during laser surgery

24. When entering a room while the laser is in use, you must

- (A) wear a lead apron
- (B) wear protective eyewear
- (C) no special precautions are necessary
- (D) wear a special mask

25. Which laser produces a visible blue-green beam?

- (A) Eximer (gas laser)

- (B) YAG
- (C) Argon laser
- (D) CO₂ laser

26. Surgery using extremely cold instrument to destroy tissue is called

- (A) laser surgery
- (B) phacoemulsification surgery
- (C) cryosurgery
- (D) ultrasonic surgery

27. Cryoablation uses a high-pressure gas called

- (A) argon
- (B) CO₂
- (C) excimer
- (D) KTP

28. All waves in the laser are monochromatic. This refers to

- (A) all waves in the laser have the same length and are one color
- (B) all waves move in columns
- (C) the diameter of the beam is the same
- (D) they use the same power settings

29. What is the medium or elements activated to transmit photons in a laser beam?

- (A) Gas
- (B) Solid
- (C) Liquid dye
- (D) All of the above

30. All of the following are true of lasers EXCEPT

- (A) lasers do not need to be locked up when not in use
- (B) laser warning signs should be visible to areas where laser surgery is being performed
- (C) a laser safety officer is required to manage laser risks and define safety protocol
- (D) only flame retardant drapes are used in laser surgery

31. Endotracheal tubes and other anesthetic equipment can easily ignite in the presence of laser energy and

- (A) silastic endotracheal tubing
- (B) O₂-rich anesthetic agents
- (C) pacemakers
- (D) defibrillators

32. The following equipment must be available during a laser laryngoscopy:

- (A) water and wet cottonoids
- (B) tracheotomy tray, wet towels
- (C) bronchoscope, tracheotomy tray
- (D) None of the above

Answers and Explanations

- 1. (D)** Motion is known as kinetic energy. The mechanical energy of an object can be a result of its motion (Frey and Price).
- 2. (C)** The rate at which work is done is called power. It is expressed as the amount of work per unit of time (Frey and Price).
- 3. (B)** Electrons border the outer perimeter of an atom and are negatively charged. These outer electrons are known as free electrons, and it is the movement of free electrons that produces electric current (Frey and Price).
- 4. (C)** The gain or loss of electrons in an atom is termed ionization. A loss converts an atom into a positively charged ion, whereas a gain converts an atom into a negatively charged ion (Frey and Price).
- 5. (D)** The transfer of thermal energy by contact is called conduction. Some energy is transferred to molecules of a second object when they collide. Certain substances are better used for this transfer, such as

metals, rather than wood or paper (Frey and Price).

- 6. (B)** A wave may be described as a disturbance in a medium such as air, water, or a solid substance (Fuller).
- 7. (B)** The frequency of sound can be measured in hertz. Multiples of sound are measured megahertz (Frey and Price).
- 8. (A)** Mechanics is the study of objects in motion, and is normally restricted to a small number of very large objects (Frey and Price).
- 9. (B)** Isaac Newton's three laws of motion are the basis of classical mechanics, or Newtonian mechanics (Frey and Price).
- 10. (A)** Acceleration is defined as a change in velocity over time (Frey and Price).
- 11. (B)** Newton's first of three laws states that "inertia is a property of matter that causes matter to resist change in motion" (Frey and Price).
- 12. (C)** Also known as the "law of conservation of momentum" states that whenever a force is exerted an equal or opposite force arises in reaction (Frey and Price).

- 13. (C)** If an object returns to its original position after a force is applied or removed, then it is said to be elastic. An example is a coiled spring (Frey and Price).
- 14. (B)** Amplitude is the maximum distance that an object moves from its central position (called equilibrium) (Frey and Price).
- 15. (B)** Refraction is the bending of a light ray as it passes from one substance to another. Light travels at differing speeds as it travels through one medium or another (such as water or glass) (Frey and Price).
- 16. (C)** Hooke proposed that light was a wave, but it was Sir Isaac Newton who posited that if light were a wave, it would bend around corners (Frey and Price).
- 17. (D)** The red wavelengths of light are the longest, whereas the violet are the shortest. The view along the color spectrum changes with each color. White is not a color, but is perceived when all colors hit the eye at the same time (Frey and Price).
- 18. (A)** In 1905, Einstein explained details of the photoelectric effect, which requires that light be a collection of particles called “photons.” Young continued his work and Neils Bohr of the University

of Copenhagen further refined the research to establish the “Complimentary Principle of Light” (Frey and Price).

- 19. (C)** In situation near the surface of the Earth, gravity causes objects to accelerate downward (Frey and Price).
- 20. (D)** A solid-state laser creates the most powerful output (Frey and Price).
- 21. (B)** The gravitational force, found only in nature and one of the four forces affecting matter, does not affect the nucleus of an atom (Frey and Price).
- 22. (B)** Protons and neutrons act as if they are identical articles and differ only in their electrical charge. The nucleons themselves are made of subatomic particles called “quarks” (Frey and Price).
- 23. (B)** During laser surgery, electricity does not pass through the patient. Therefore, a grounding pad is not necessary (Fuller).
- 24. (B)** The laser beam can cause permanent eye damage if viewed directly or indirectly by reflection (Fuller).
- 25. (C)** Argon gas lasers produce a visible blue-green beam that is absorbed by red, brown pigmented tissue

such as hemoglobin. The argon laser is most used in dermatological and ophthalmologic procedures (Fuller).

- 26. (C)** Cryosurgery uses liquid nitrogen which freezes almost immediately and eventually will slough mainly used to treat small skin lesions.
- 27. (A)** A high-pressure argon gas is injected into the cryoablation probe causing the surrounding tissue to freeze (Fuller).
- 28. (A)** All waves in the laser have exactly the same length. Their peaks and troughs are in exactly the same location. This is called coherency.
- 29. (D)** Laser energy is created when light is pumped into a sealed chamber and filled with a medium. Examples are gas, solids, and liquids (Fuller).
- 30. (A)** Lasers are required when not in use under the laser precautions and guidelines (Surgical Technology for the Surgical Technologist, 3rd ed.).
- 31. (B)** In the presence of laser energy and O₂-rich anesthetic agents, anesthesia equipment could easily ignite. To minimize the risk of endotracheal fires, a special metallic foil is wrapped around the

endotracheal tube before surgery (Fuller).

32. (A) Sterile water must be available to keep sponges and linens wet in case of fire (Fuller).

CHAPTER 35

Endoscopy and Minimally Invasive Surgery

Questions

- 1.** All of the following applications can be performed through an endoscope EXCEPT

 - (A) cavity washings for diagnosis
 - (B) video monitoring
 - (C) biopsy
 - (D) resection of malignant tumors

- 2.** During minimally invasive surgery (MIS), what is used to achieve a pneumoperitoneum?

 - (A) Warm saline
 - (B) Oxygen
 - (C) Carbon monoxide
 - (D) Carbon dioxide

- 3.** Not all patients are suitable for MIS. The term is for patients who have scarring of internal organs due to previous abdominal surgeries is

- (A) abdominal adhesions
- (B) wound dehiscence
- (C) intestinal polyps
- (D) evisceration

4. Which endoscope is used to perform surgical assessment and operative procedures such as a TURP?

- (A) Flexible endoscope
- (B) Rigid endoscope
- (C) Laparoscope
- (D) Sigmoidoscope

5. The system used to accommodate insertion of a laparoscope and endoscopic instruments is called

- (A) diagnostic endoscope
- (B) trocar and cannula
- (C) Verres needle
- (D) endo coupler

6. When performing MIS in the upper abdomen or the lower esophagus the patient is positioned in

- (A) Trendelenberg
- (B) lateral
- (C) reverse Trendelenberg
- (D) prone

7. For a laparoscopic tubal ligation, the patient is placed in

- (A) lithotomy
- (B) Semi-Fowler
- (C) lateral
- (D) reverse Trendelenberg

8. All of the following statements are true of the fiber optic light cord EXCEPT

- (A) A the cable is composed of thousands of glass or plastic fibers
- (B) the fibers are aligned in parallel longitudinal bundles
- (C) the cord can be overflexed and coiled
- (D) fibers are easily broken

9. The clarity of the image depends on the numbers of signals or silicone units the chip contains. The name for these silicone units are

- (A) adapter
- (B) pixel
- (C) endocoupler
- (D) Storz

10. All are guidelines for proper handling of a telescope

EXCEPT

- (A) take care to prevent scratches or dents in the shaft of the scope
- (B) always hold the scope by its shaft
- (C) use warm water or a defogger to prevent the lens from fogging during surgery
- (D) everyone who handles the scope from processing to end stage is responsible to ensure integrity of the instrument

11. What part of the endoscopic equipment transmits digital data from the camera head to the camera control unit and from the monitor to the output recorder?

- (A) Endoscopic lock ring
- (B) Focus ring
- (C) Video cables
- (D) Video printer

12. All of following are true of white balancing EXCEPT

- (A) the light cable must be connected to the telescope
- (B) direct the lens to a solid white object
- (C) you can use the back of sterile drape or a surgical sponge
- (D) the white balance registers automatically by the

light source

- 13.** Technique used in arthroscopic MIS, hysteroscopy, and cystoscopy to expand the body cavity is
- (A) balloon dissection
 - (B) continuous irrigation
 - (C) insufflations
 - (D) infiltration
- 14.** Injury from continuous irrigation where the fluid enters the vascular system is
- (A) embolization
 - (B) endoscopic distension
 - (C) intravasation
 - (D) ablation
- 15.** In MIS, large specimens and dense tissue are reduced to small pieces by a process called
- (A) morcellization
 - (B) Harmonic ultrasonic energy
 - (C) ablation
 - (D) fulgaration
- 16.** Guidelines for cleaning endoscopic instruments include all of the following EXCEPT

- (A) soak instruments for 2 hours
- (B) before cleaning, open all stop cocks, ports, and channels
- (C) look for defects in the surface of the instrument before cleaning
- (D) drain and dry all instruments

Answers and Explanations

- 1. (D)** Resections of malignant tumors are usually approached through large open incisions because the cavity must also be explored after removal of the tumor (Frey and Price).
- 2. (D)** Carbon dioxide is used to achieve a pneumoperitoneum because it is nontoxic, readily absorbed by the body and nonflammable (Fuller).
- 3. (A)** Patients who have had previous abdominal surgery and have developed scarring of their organs or adhesions are at risk for a perforation of their intestines during insertion of the trocar.
- 4. (B)** A rigid endoscope would be used on a TURP. A laparoscope, although rigid, is only used on the abdomen whereas a flexible endoscope is used to assess regional anatomy, tissue biopsies, and minor surgical procedures (Fuller).
- 5. (B)** A trocar is a solid rod with a tapered or solid end that fits into the hollow tube cannula (Fuller).

- 6. (C)** Reverse Trendelenberg position is used to displace the abdominal viscera for better visualization (Fuller).
- 7. (A)** Laparoscopic GYN cases are commonly performed with the patient in lithotomy position. This allows the surgeon the ability to manipulate the uterus during the procedure (Fuller).
- 8. (C)** You must handle the fiber optic cables gently. When storing or transporting the cable, you must coil it loosely. Do not hang the cable. It must be stored in a flat position.
- 9. (B)** Pixels are located in the head of the camera or the tip of the telescope. The more pixels, the more clearer the image (Delmar).
- 10. (B)** Scope should always be held by the head, which is the heavier end, and never by the end or the shaft. When holding the scope by the lighter end, the weight of the handpiece can bend the shaft and damage it (Delmar).
- 11. (C)** The video cables are high-quality fiber optic systems. They transmit data from the camera head to the camera control unit and from the monitor to the output recorder.

- 12. (C)** You should not use porous or woven materials such as a surgical sponge because this can produce shadows on the image (Fuller).
- 13. (B)** Continuous irrigation is used to expand the space for visualization and should be nonconductive and salt free (Fuller).
- 14. (C)** When increase in fluid irrigation exceeds a safe level, causing the fluid to enter the vascular system and increases blood pressure (Fuller).
- 15. (A)** The morcellator reduces the tissue to pulp, which can be suctioned from the wound (Fuller).
- 16. (A)** Do not soak instruments for longer than 1 hour or as directed by manufacturer. Do not submerge or allow fluid to enter electrical connections or units.

CHAPTER 36

Surgical Robots

Questions

- 1.** What term identifies the arms of a robot in surgery?

 - (A) Articulations
 - (B) Ratchets
 - (C) Graspers
 - (D) Manipulators
- 2.** An “up and down” movement of a robot’s arm is known as

 - (A) roll
 - (B) yaw
 - (C) pitch
 - (D) rotation
- 3.** The “right to left” movement of a robotic arm is called

 - (A) yaw
 - (B) roll
 - (C) pitch
 - (D) x-y-z-axis rotation

4. What term is used when likening “robotic vision” to “human vision”?

- (A) Sensitivity
- (B) Binocular vision
- (C) Depth perception
- (D) Resolution

5. What allows the robotic computer to create and record three-dimensional data of the surgical site?

- (A) Magnetic resonance sites
- (B) Image planning
- (C) Laser scanning
- (D) CT scan

6. Which of the following parts for robotic surgery should NOT be sterilized?

- (A) Manipulators
- (B) The collar that connects the endoscope
- (C) The endoscope
- (D) Surgical instrumentation

7. Sterilization of component parts for endoscopic robotic surgery is best accomplished by

- (A) STERIS system

- (B) steam sterilization
- (C) hydrogen peroxide sterilizer
- (D) ETO gas sterilization

8. The most popular robotic system used today is

- (A) AESOP HR
- (B) da Vinci system
- (C) surgical navigation system
- (D) Both A and B

9. All are advantages of robotic surgery EXCEPT

- (A) reduction of hand tremors
- (B) plays a role in distant surgical interventions
- (C) it is expensive and uses valuable resources
- (D) robotic images are three-dimensional

10. What term is used when the surgeon performs the surgical procedure miles away from the surgeon?

- (A) Expert systems
- (B) Telesurgery
- (C) Coordinate geometry
- (D) Degrees of freedom

11. What term is referred to the ability of humans and robots to determine which direction sound is coming

from?

- (A) Biaural hearing
- (B) Unidirectional hearing
- (C) Voice activated
- (D) Automated hearing

12. The technical term for the extent that a robotic joint or joints can move clockwise or counterclockwise around an axis is

- (A) manipulation
- (B) degree of freedom
- (C) roll
- (D) degrees of rotation

13. The ability of a machine, microscope, human, and robot to differentiate between two objects is called

- (A) resolution
- (B) binaural vision
- (C) cylindrical geometry
- (D) degrees of freedom

14. The goal of deformable modeling is

- (A) replace an MRI
- (B) translate a surgeon's hand movements

- (C) achieve a three-dimensional model
- (D) position the manipulators

15. The ability of the robot to see in dim light is known as

- (A) stereo vision
- (B) binaural vision
- (C) sensitivity
- (D) depth perception

16. Which term refers to a rotating movement?

- (A) Pitch
- (B) Rotation
- (C) Roll
- (D) A 360-degree turn

17. The position used for a robotic-assisted prostatectomy is a

- (A) lateral kidney
- (B) low lithotomy
- (C) pfannenstial
- (D) prone

18. The STSR's responsibility when setting up for a robot case includes

- (A) check all instruments prior to using
- (B) white balance and calibrate camera
- (C) determine where the third arm will be placed
- (D) All of the above

19. Where is the robot positioned during a prostatectomy?

- (A) Right side
- (B) Left side
- (C) Between legs
- (D) At the head

20. The #3 arm of the robot moves

- (A) up and down
- (B) in and out
- (C) right and left
- (D) left only

21. The #1 arm of the robot holds

- (A) scope and camera
- (B) instruments
- (C) insufflation tubing
- (D) None of the above

22. STSR's responsibility when changing instruments on the robotic arm is

- (A) advance the instrument
- (B) guide the instrument
- (C) choose the next instrument
- (D) wash instrument

23. The robotic system does not engage until the surgeon

- (A) positions the foot switch
- (B) robotic arms are engaged
- (C) places head in the viewer
- (D) surgeon speaks into microphone in console

24. When performing a cholecystectomy using the robot, the robotic arm is placed

- (A) right side, mid abdomen
- (B) patients' left side mid abdomen
- (C) patients' right thigh level
- (D) patients' left thigh level

25. Which anatomical landmark is used to line up the endoscope for a laparoscopic cholecystectomy using a robotic arm?

- (A) Umbilicus
- (B) Chest line
- (C) Iliac crest

(D) Xyphoid process

Answers and Explanations

- 1. (D)** The term used to identify the robotic arms that control the surgical efforts is manipulators (Frey and Price).
- 2. (C)** Pitch identifies the up and down movement of the arms jaw, and yaw identifies right and left movement of the jaw. The rotating movement of the shaft is called a roll (Frey and Price).
- 3. (A)** A “right to left” movement of a jaw is called a yaw (Frey and Price).
- 4. (B)** Binocular machine vision is analogous to human vision, which is also known as stereovision. This vision is similar to the robot’s binaural hearing (Frey and Price).
- 5. (C)** Once an MRI or CAT scan is performed to retrieve a layout of the person’s anatomy, a laser scan is then done to achieve a set of three-dimensional coordinates on the patients skin (Frey and Price).
- 6. (A)** The manipulators that hold the endoscope and the

instrumentation are not sterilized, they are covered with a sterile sleeve (Frey and Price).

- 7. (A)** The “STERIS System” (paracetic acid) sterilizer is ideal for sterilization of camera, light cord, and other delicate components used for the procedure (Frey and Price).
- 8. (D)** The primary robotic system used in the operating room today is the da Vinci System (Frey and Price).
- 9. (C)** Robotics requires a substantial investment in both time and money, spent learning coordinating and the imaging system. Instruments cost thousands of dollars and must be discarded after limited use. They cannot be recycled (Delmar).
- 10. (B)** Telesurgery refers to the operation of the robot at a distance, the operator is at one location and the robot is on site with the patient at another location (Fuller).
- 11. (A)** Binaural hearing is the ability to determine the direction the sound is coming. Humans have two ears and robots are given two sound transducers that provide the same ability (Delmar).
- 12. (D)** Degrees of rotation relate to a manipulator’s clockwise and counterclockwise movements around

an axis (Delmar).

- 13. (A)** Resolution is the extent that a machine, microscope, human, and robot use to differentiate between two objects (Delmar).
- 14. (C)** The goal of a deformable model is to achieve a realistic three-dimensional simulation of soft tissue behavior under the effect of an external simulator (Fuller).
- 15. (C)** In some instances, a high level of sensitivity is necessary. An example of this is during an endoscopic case, OR lights are dimmed or turned off. The robot requires a level of sensitivity to see in such dim lighting (Fuller).
- 16. (C)** The rotating movement of a robot is called a roll (Fuller).
- 17. (B)** The patient is placed in lower lithotomy and the robotic arms are placed between the patients' knees (Fuller).
- 18. (D)** The STSR's duties include checking instruments, while balancing calibrating camera and making sure the third arm is properly placed (Casey).
- 19. (C)** During prosectomies, the robot is placed between

the legs, so the robotic arms come up from the bottom (Casey).

- 20. (C)** The #3 arm on the robotic system swings right and left (Casey).
- 21. (A)** The #3 arm on all robots accommodates the scope and camera (Casey).
- 22. (B)** The STSR's responsibility is to only guide the instrument for the surgeon as his/her eyes are on the screen. They should NEVER advance the instrument for fear of perforating the colon (Casey).
- 23. (C)** Before surgery, the surgeon makes adjustments to the seating, optical viewer, and intercom while his/her head is outside the viewer. The system is engaged when the surgeon places their head in the viewer (Casey).
- 24. (C)** The robotic arm is placed on the patients' right thigh level (Casey).
- 25. (D)** The xyphoid process is used as a landmark prior to starting a laparoscopic cholecystectomy (Casey).

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