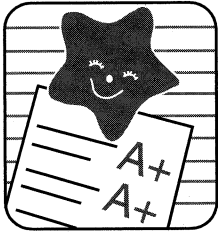


**S
★
T
★
A
★
R
★
S**



Specialized Topics in Areas of Radiologic Sciences
P.O. Box 2931 Toledo, Ohio 43606
Phone: 419-471-1973
Website: www.xrayhomestudies.com

Unit 42

Fundamentals of Special **Radiographic Procedures**

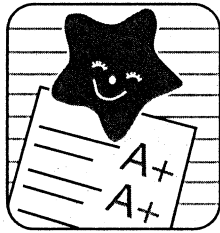
by

Albert M. Snopek

Prepared by: Carolyn J. Frigmanski, M.A., B.S.R.T. ®
Founder, S.T.A.R.S.

Expiration Date: Annual Renewal 22.5 Category A c.e.u.s

S
★
T
★
A
★
R
★
S



Specialized Topics in Areas of Radiologic Sciences

P.O. Box 2931 Toledo, Ohio 43606

Phone: 419-471-1973

Website: www.xrayhomestudies.com

Dear Participant,

Welcome to your selected S.T.A.R.S. developed continuing education units!!

These units consist of the text(s) on the desired topic and a multiple question, short answer post test. These units have been approved by the American Society of Radiologic Technologists. The number of Category A c.e.u.s is included on the order form and last page of the post test of each unit. **Our order form and new topics can be viewed online on our web site and always contains the renewal dates if you are interested in checking it out! Please feel free to share this information!**

- All unit post tests must be returned for Units 1-22 for the designated c.e.u. credit.
- If you have only post test(s) for any unit higher than 22, the post test(s) are the only page(s) to be returned. Please remember that others may share your published texts & only order post tests to get c.e.u. credit too.
- Units 1 - 12 have also been approved by the Ohio Department of Health for c.e.u.s for radiographers for Ohio state license purposes.

To secure your c.e.u.s, you must complete the reading & post test questions with a 75% or higher score on the individual units within the set. If you have received a 75% or higher score on each post test, we will forward your certificate immediately and keep your post tests for our records. If you did not get a 75% on a post test, we will send it back to you uncorrected for your evaluation and re-submission. No refund will be provided for unsatisfactory personal performance on any unit purchased.

- *You need to return the post test pages only to the following address:*

- *S.T.A.R.S. P.O. Box 2931 Toledo, Ohio 43606*

You may place a maximum of 5 sheets of post test pages in one standard size business envelope with the current accepted postage amount. Your post test pages will be checked on the same day or within 24 hours or less upon receipt to our office. **DO NOT FAX YOUR POST TESTS** because the A.S.R.T. requires that we must keep original records for 3 years and faxes fade over time!!

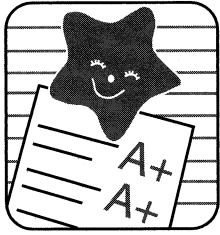
Please feel free to contact me at our e-mail address: info@xrayhomestudies.com or at the office at (419) 471 - 1973. If I am not available for your call, please leave a message on the answering machine and I will return your call as quickly as possible. We would love to hear from you and others!

Thank you for choosing S.T.A.R.S. for your continuing education needs.

Sincerely,

A handwritten signature in black ink, appearing to read 'Carolyn', with a long horizontal line extending to the right.

Carolyn J. Frigmanski, M.A., B.S.R.T. ®
Founder, S.T.A.R.S.

**Specialized Topics in Areas of Radiologic Sciences**

P.O. Box 2931 Toledo, Ohio 43606

Phone: 419-471-1973

Website: www.xrayhomestudies.com

Unit 42 Title: Fundamentals of Special Radiographic Procedures by Albert M. Snopek

Please complete the answer sheet at the conclusion of this post test and return it to the S.T.A.R.S. office.

Chapter 1

1. The term used to describe procedures that are performed to treat pathologic processes is
 - a. diagnostic
 - b. interventional
 - c. therapeutic
 - d. radiologic
2. Centralized oxygen supply and vital sign monitors should be equipped in the
 - a. patient holding area
 - b. control room
 - c. radiographic room only
 - d. laboratory area
3. The minimum mA ratings to be utilized in a special procedures suite performing a great deal of vascular radiography is
 - a. 300 – 500
 - b. 400 – 600
 - c. 500 – 700
 - d. 700 – 1,500
4. The constant factor for HU (heat unit) calculation with a three – phase (12 pulse) generator is
 - a. 1
 - b. 1.35
 - c. 1.41
 - d. 1.45
5. Another name for a cineangiographic tube rating chart is
 - a. maximum mA chart
 - b. percent duty factor curve
 - c. serial angiographic chart
 - d. percent tube rating
6. As the angle of the target face decreases, the effective focal spot _____ using the line focus principle.
 - a. decreases in size
 - b. remains the same
 - c. increases in size
 - d. creates more blur

Chapter 2

7. Older analog systems are being replaced with
 - a. three – phase (6 pulse) radiographic systems
 - b. high frequency generator systems
 - c. computed and/or digital radiographic systems
 - d. three – phase (12 pulse) radiographic systems

8. The term used in rapid serial changers to identify a period of time during which no motion occurs and the film is in position for the exposure is known as
- a. transport time
 - b. stationary period
 - c. zero time
 - d. phase-in time
9. The component in image intensification that is coated with cesium iodide is called the
- a. input screen
 - b. output screen
 - c. photoemissive layer
 - d. photocathode
10. The professional organization that developed the Digital Imaging and Communications in Medicine Standards or DICOM is
- a. American Society of Radiologic Technologists
 - b. American College of Radiology
 - c. American Medical Association
 - d. American Registry of Radiologic Technologists
11. The photofluorographic camera that records images on 70, 90, 100 and 105 mm formats is called a
- a. cine camera
 - b. multifformat camera
 - c. scintillation
 - d. serial spot film
12. The laser imaging system that utilizes thermal energy to produce hard copy prints of digital studies is called
- a. "wet" laser
 - b. digital formatting
 - c. "dry" laser
 - d. analog conversion
13. The array of values in digital imaging becomes productive information through the use of a(an)
- a. computer program or algorithm
 - b. electronic output device
 - c. "aerial" imaging component
 - d. digital image intensifier
14. The component in flat panel digital imaging composed of a thin layer of silicon in an amorphous state is
- a. the scintillation screen
 - b. the thin film transistor (TFT)
 - c. the photodiode
 - d. the photocathode
15. Given a standard field size, the larger the number of pixels in the matrix, the _____ the resolution.
- a. lesser
 - b. grainier
 - c. grayer
 - d. greater
16. A group of 8 bits is referred to as a
- a. matrix
 - b. binary complex
 - c. byte
 - d. octal component
17. The human eye can distinguish only _____ shades (gray levels) at one time.
- a. 32
 - b. 50
 - c. 100
 - d. 200

18. The term used in subtraction for the exact copy of the base film with the densities exactly reversed is
- a. scout film b. diapositive mask c. reverse tone mask d. negative mask
19. Film used for subtraction principles must have a gamma of
- a. 1 b. 1.5 c. 2 d. 2.5
20. IV contrast agent concentrations can be as low as _____ to _____ % to be visualized in digital subtraction.
- a. 1/3 b. 3/6 c. 6/10 d. 10/20
21. In digital subtraction angiography, an exposure rate of _____ to _____ mR per image will not lose contrast.
- a. 1/2 b. 3/6 c. 6/10 d. 10/20
22. The most common method of digital subtraction is
- a. energy b. hybrid c. temporal d. c-arm

Chapter 3

23. The determination of the speed or rate of flow of an automatic injection is based on the
- a. vessel size b. suspected pathology c. vessel length d. target site
24. Most automatic injectors are designed to be triggered when the head is pointed toward the
- a. floor b. patient c. ceiling d. far wall
25. Greater catheter lengths will provide _____ resistance to contrast agent flow than shorter lengths.
- a. less b. more c. equal d. variable
26. A saline bolus "chaser" for certain computed tomography (CT) studies can reduce the risk of
- a. allergic reaction b. contrast nephropathy c. myocardial infarction d. stroke

Chapter 4

27. The catheter material that has good memory and larger inner diameters is
- a. Teflon b. polyethylene c. polyester d. polyurethane
28. A 5 French catheter has an outside diameter of _____ mm.
- a. 1 b. 1 2/3 c. 2 d. 3
29. A _____ catheter shape is used when the angle of a selected vessel is between 60 and 120 degrees from the aortic axis.
- a. angled b. re-curved c. pigtail d. curved

55. A drug used to reduce the effects of laryngospasm and the production of saliva is

- a. diazepam (Valium)
- b. diphenhydramine (Benadryl)
- c. naloxone (Narcon)
- d. atropine

56. One of the drugs recommended for patients in shock is

- a. aminophylline
- b. Solu-Cortef
- c. dopamine
- d. Verapamil

57. A teaspoon of liquid medication is equivalent to _____ milliliters (ml).

- a. 5.0
- b. 6.0
- c. 7.0
- d. 8.0

Chapter 6

58. Air and oxygen can be dangerous negative contrast agents because either gas can cause

- a. vessel rupture
- b. dyspnea
- c. gas emboli
- d. hyperventilation

59. Nonionic radiopaque contrast media are preferred in special procedures because they

- a. are less expensive
- b. have high osmolality
- c. have lower compatibility with other medications
- d. reduce adverse reactions

60. An ionic organic iodine compound disassociates to form positively-charged particles called

- a. cations
- b. ions
- c. anions
- d. electrons

61. The _____ atoms are responsible for providing the radiopacity of the contrast agent.

- a. meglumine
- b. iodine
- c. sodium
- d. potassium

62. Most of the positive contrast agents are eliminated through the _____ system.

- a. biliary
- b. gastrointestinal
- c. urinary
- d. respiratory

63. Before injecting any radiopaque contrast medium, the imaging professional should always

- a. use gloves, gown and mask
- b. check for living will and other legal documents
- c. have relatives available on site
- d. establish a set of baseline vital signs

64. To minimize renal failure risks after the administration of a contrast medium, the imaging professional should advise patients to drink _____ ml of fluids prior to the procedure.

- a. 200
- b. 300
- c. 400
- d. 500

65. Urticaria, sneezing and nausea are all considered _____ symptoms of reaction.
- a. insignificant b. mild/moderate c. severe d. excessive
66. Lactic acidosis may occur after the administration of a contrast medium for type 2 diabetics taking
- a. insulin
b. hypoglycemia medication
c. Glucophage (metformin hydrochloride)
d. Bicarbonates
67. One of the risk factors for extravasation is
- a. improper use of automatic injection devices
b. the use of low osmolar contrast medium
c. indwelling catheters in place for less than 24 hours
d. the use of plastic rather than metal needles
68. Intravenous contrast medium in magnetic resonance imaging (MRI) must possess the property of
- a. ionization b. attenuation c. osmosis d. chelation

Chapter 7

69. The normal adult laboratory values for prothrombin time (PT) is _____ to _____ seconds.
- a. 5/7 b. 10/13 c. 15/20 d. 25
70. The normal adult laboratory values for creatinine in female patients is _____ to _____ mg/dl.
- a. 0.1/1.0 b. 0.3/0.8 c. 0.6/1.3 d. 1.0/3.0
71. Patients who routinely take heparin should have it stopped _____ to _____ hours before a special procedure.
- a. 2/6 b. 3/8 c. 6/12 d. 12/24
72. Informed consent documents must contain
- a. signatures from the patient and the next of kin
b. financial mechanisms for reimbursement for the special procedure
c. decisions about the degree of resuscitation efforts by the imaging staff
d. disclosure of risks involved with the procedure
73. The most important aspect of intraprocedural patient care to be performed by imaging professionals is
- a. periodic lab work during the procedure
b. continuous monitoring of vital signs
c. oxygen administration at all times
d. drug administration

Chapter 8

74. The first human cardiac catheterization was performed in 1929 by
- a. Egas Moniz b. Walter Dandy c. Werner Forssmann d. Claude Bernard
75. On normal electrocardiograms, the repolarization of ventricular tissue is identified as the
- a. T wave b. ST segment c. P wave d. QRS complex
76. Atrial tachycardia is diagnosed when heart rates are _____ to _____ beats/minute.
- a. 100/150 b. 150/350 c. 200/250 d. 250/400
77. The recommended puncture technique used when there is a suspected aneurysm or occlusion in the aorta is
- a. the brachial approach
b. translumbar approach
c. femoral vein approach
d. translumbar inferior vena caval approach
78. Manual compression on arterial puncture sites should be performed for a minimum of _____ minutes.
- a. 5 b. 10 c. 15 d. 20

Chapter 9

79. A rotating fan beam with a 360-degree stationary ring of detectors is used in the _____ generation of computed tomography (CT) scanners.
- a. first b. second c. third d. fourth
80. The attenuation of various tissues are related to or compared to the Hounsfield number or EMI of
- a. water b. cerebrospinal fluid c. congealed blood d. bone tissue
81. The scanning process in which the data is acquired continuously during rapid translation (movement) of the patient couch through the gantry is described as
- a. rotation/translation b. step volume c. continuous volume d. electron beam

Chapter 10

82. The type of magnet that does not require the use of an electric current to make a magnetic field is called a
- a. permanent b. resistive c. superconductive d. coiled
83. The system designed to provide homogeneity of the magnetic field is known as
- a. passive shimming b. precession c. active shimming d. gradient cohesion

84. The _____ frequency is the frequency that will cause a transition between 2 spin energy levels of a nucleus.

- a. radio b. Larmor c. electromagnetic d. excitation

85. The T_2 process is also described as

- a. spin-lattice relaxation
b. saturation recovery
c. phase decoding
d. spin-spin relaxation

Chapter 11

86. The term used to describe the amount of time it takes for one half of the activity to decay is called its

- a. physical half-life b. biological half-life c. half-life disintegration d. basic half-life

87. The _____ camera is the most commonly used equipment for imaging in nuclear medicine.

- a. digital b. analog c. scintillation d. Anger

88. Annihilation radiation is used to create images in

- a. single photon emission computed tomography (SPECT)
b. fusion imaging
c. positron emission tomography (PET)
d. computed tomography

Chapter 12

89. The blood vessel layer responsible for maintaining homeostasis in the circulatory system is

- a. tunica media b. tunica adventitia c. tunica intima d. tunica externa

90. The portion of the aorta that provides the brachiocephalic trunk, the left coronary and left subclavian arteries is called the

- a. aortic arch b. aortic root c. ascending aorta d. descending aorta

91. Patients who exhibit signs of aortic stenosis should undergo

- a. coronary angiography
b. thoracic aortography
c. pulmonary arteriography
d. femoral arteriography

92. The normal systolic left ventricular pressure (peak systolic) is _____ to _____ mm Hg.

- a. 17/32 b. 60/80 c. 90/140 d. 150/175

93. The method using indocyanine green (cardio green) to measure cardiac output is called

- a. thermodilution b. Fick c. angiographic d. dye dilution

Chapter 13

94. The first branch originating in the ventral aorta is the

- a. celiac trunk b. renal artery c. gastric artery d. hepatic artery

95. The artery that subdivides in the kidney to form afferent arterioles in the glomerulus is called the

- a. interlobar b. arcuate c. interlobular d. efferent

96. Acute hypertension in cases of unsuspected pheochromocytoma may result from _____ angiography.

- a. renal b. adrenal c. testicular d. uterine

Chapter 14

97. The cecum, terminal ileum and appendix is supplied with arterial blood by the _____ artery.

- a. colic b. mesenteric c. celiac d. ileocolic

98. Arteriovenous malformations, diverticulosis and portal hypertension may be an indication of

- a. gastrointestinal bleeding
b. chronic ischemia
c. neoplasm formation
d. multiple benign lesions

99. A 15-degree right posterior oblique projection would be recommended when performing

- a. celiac trunk angiography
b. pancreatic angiography
c. arterial portography
d. hepatic flush renography

Chapter 15

100. Ewing's tumor, embolism, neurofibromas and presurgical mapping are specific conditions warranting

- a. venography b. digital subtraction c. arteriography d. aortography

Chapter 16

101. The common carotid artery bifurcates into the internal and external carotid arteries at the level of the

- a. thyroid cartilage b. sterno-clavicular joint c. seventh vertebra d. suprasternal notch

102. The union of four major arteries supplying the brain with blood is known as the

- a. vertebrobasilar system
- b. isle of Reil
- c. Sylvian triangle
- d. Circle of Willis (circulus arteriosus)

Chapter 17

103. The interventional procedure recommended to reduce bleeding during and after surgical procedures is

- a. transcatheter embolization
- b. vena cava filtering
- c. stent placement
- d. atherectomy

104. The material used as a solid (permanent) occluder is

- a. gelatin sponge (Gelfoam)
- b. starch microspheres (Spherex)
- c. wire baffles
- d. glass microspheres

105. Complications after transcatheter embolization may last up to _____ to _____ hours after completion.

- a. 4/8
- b. 12/16
- c. 24/48
- d. 36/48

106. The temperature of an open-tipped laser probe ranges from _____ to _____ degrees Celsius.

- a. 100/300
- b. 400/600
- c. 1,000/1,500
- d. 2,000/3,000

107. The atherectomy system that uses a cutter or “burr” to remove or pulverize plaque is called

- a. circumferential
- b. directional
- c. extraction
- d. percutaneous

108. Stents made from thermal memory materials are referred to as

- a. spring action
- b. balloon expandable
- c. self-expanding
- d. intrastent

109. The major indicator for vena cava filter placement is

- a. plaque formation
- b. deep vein thrombosis
- c. foreign body retrieval
- d. aneurysm

Chapter 18

110. A newer stent system that has been developed to reduce restenosis is called

- a. self-expanding
- b. “drug eluting”
- c. balloon occlusion
- d. restabilization

111. The procedure recommended to relieve stenosis in coronary and pulmonary vessels is known as

- a. “commissurotomy”
- b. cardiac catheterization
- c. valvuloplasty
- d. open heart surgery

112. One of the indications for catheter ablation is

- a. atrial fibrillation
- b. pulmonary hypertension
- c. mitral valve prolapse
- d. intraseptal defect

Chapter 19

113. The interventional procedure recommended for patients experiencing acute gastrointestinal (GI) bleeding is

- a. stent placement in celiac trunk
- b. transcatheter embolization
- c. percutaneous gastrostomy
- d. balloon angioplasty

114. The interventional procedure recommended for patients experiencing biliary obstruction and common bile duct stones is

- a. metallic stent placement in the common bile duct
- b. balloon angioplasty
- c. endoscopic retrograde cholangiopancreatography (ERCP)
- d. surgical cholangiography

115. Percutaneous lithotripsy would be recommended for patients who possess

- a. malignant ureteral stricture
- b. fistula
- c. acute urinary retention
- d. staghorn calculi

116. The preferred imaging modality to use for biopsy of the vertebral column is

- a. computed tomography (CT)
- b. ultrasound
- c. magnetic resonance imaging (MRI)
- d. conventional fluoroscopy

117. The procedure designed to temporarily drain an obstructed urinary system resulting from calculus is

- a. trocar method
- b. Penrose drain
- c. percutaneous puncture
- d. percutaneous nephrostomy

118. A major complication of percutaneous interventional studies is

- a. perforation
- b. persistent site pain
- c. infection
- d. excessive bleeding

Chapter 20

119. Hysterosalpingography has been used as an effective therapeutic tool for
- a. endometriosis
 - b. pelvic inflammatory disease
 - c. infertility
 - d. syphilis
120. After hysterosalpingography, a 24 hour delayed film may be needed to demonstrate
- a. tubal patency when an iodized oil is used
 - b. fistulas are discovered
 - c. tubal patency when a water-soluble contrast medium is used
 - d. locations of ectopic pregnancy
121. Hysterosalpingography should be performed
- a. toward the end of the first week after menstruation
 - b. during the middle of the menstrual cycle
 - c. toward the end of the last week after menstruation
 - d. at any time within the menstrual cycle
122. The preferred screening procedure for the initial evaluation of infertility and dysfunctional uterine bleeding is
- a. computed tomography (CT)
 - b. magnetic resonance imaging (MRI)
 - c. contrast hysterosalpingosonography
 - d. conventional fluroscopy

Chapter 21

123. The third ventricle communicates with the fourth ventricle through the
- a. foramen of Monro
 - b. subarachnoid space
 - c. subarachnoid cisternae
 - d. aqueduct of Sylvius
124. The most commonly used contrast agents for myelography are in the category of
- a. negative
 - b. oily-based
 - c. nonionic water-soluble
 - d. ionic
125. The vertebral interspace for injection during lumbar myelography is usually at the
- a. first and second
 - b. second and third
 - c. third and fourth
 - d. fourth and fifth
126. In lumbar myelography, most projections are performed with a _____ beam.
- a. horizontal
 - b. tangential
 - c. axial
 - d. vertical

Chapter 22

127. The duct which opens into the mouth opposite the second upper molar tooth is called

- a. Stenson b. duct of Rivinus c. Wharton d. sublingual

128. Delayed films may be needed after sialography on patients with a clinical history or diagnosis of

- a. salivary tumor b. sialectasia c. abcess d. ductal stenosis

129. Today, imaging of the salivary glands is commonly accomplished by using

- a. conventional films b. conventional fluoroscopy c. nuclear medicine d. computed tomography

Chapter 23

130. The type of joint that allows movement in three axes including rotation is called

- a. ball-and-socket b. hinge c. pivot d. saddle

131. The _____ joint is described as a diarthrotic (gliding) joint.

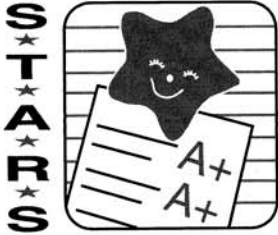
- a. elbow b. knee c. sacroiliac d. hip

132. The concentration of a positive radiopaque contrast medium should be no more than _____% (percent).

- a. 25 b. 30 c. 40 d. 60

133. The position utilized to best demonstrate the medial and lateral meniscus during arthrography is

- a. anteroposterior b. external oblique c. crosstable lateral d. tangential



Specialized Topics in Areas of Radiologic Sciences

P.O. Box 2931 Toledo, Ohio 43606

Phone: 419-471-1973

Website: www.xrayhomestudies.com

The ASRT Department of Education has approved the post-test for **22.5 Category A Continuing Education credit(s)**. See order form for current expiration date. The American Registry of Radiologic Technologists (ARRT) allows no more than three (3) attempts to successfully complete this unit.

Please complete the following information so that you can obtain a signed certificate from an official from S.T.A.R.S. when you receive a 75% or higher score. **(Please print)**

Name _____

Address _____

City _____ State _____ Zip Code _____

Social Security Number _____ Date _____

**Answer Sheet for: Unit 42: Fundamentals of Special Radiographic Procedures by
Albert M. Snopek**

Please place your lettered selection for each question in the respective box and return *ONLY this post test sheet to S.T.A.R.S.*

1.	11.	21.	31.	41.	51.	61.
2.	12.	22.	32.	42.	52.	62.
3.	13.	23.	33.	43.	53.	63.
4.	14.	24.	34.	44.	54.	64.
5.	15.	25.	35.	45.	55.	65.
6.	16.	26.	36.	46.	56.	66.
7.	17.	27.	37.	47.	57.	67.
8.	18.	28.	38.	48.	58.	68.
9.	19.	29.	39.	49.	59.	69.
10.	20.	30.	40.	50.	60.	70.

Please continue on the reverse side.

**Answer Sheet for: Unit 42: Fundamentals of Special Radiographic Procedures by
Albert M. Snopek**

Please place your lettered selection for each question in the respective box and return *ONLY this post test sheet* to S.T.A.R.S.

71.	81.	91.	101.	111.	121.	131.
72.	82.	92.	102.	112.	122.	132.
73.	83.	93.	103.	113.	123.	133.
74.	84.	94.	104.	114.	124.	
75.	85.	95.	105.	115.	125.	
76.	86.	96.	106.	116.	126.	
77.	87.	97.	107.	117.	127.	
78.	88.	98.	108.	118.	128.	
79.	89.	99.	109.	119.	129.	
80.	90.	100.	110.	120.	130.	