




## Saudi Radiologic Technologist Licensure Examination (SRTLE)

### Examination Content Guideline



**Note:** Read this guide before submitting an application to test. At the time of application, you will be required to acknowledge that you have read and understood this guide and the policies and procedures contained within.

## Examination Model

### General Rules

#### What are Licensure Examinations?

Licensure Examinations are assessments to ensure that the public will not be harmed by the incompetence of healthcare practitioners. Licensure Examinations assess the ability to apply knowledge, concepts, and principles that constitute the basis of safe and effective health care.

#### What is Saudi Radiologic Technologist Licensure Examination (SRTLE)?

The SRTLE is an exam that assesses the readiness of a Radiologic Technology Specialist to practice and/or proceed to postgraduate training. It consists of 200 questions and may include up to 10% pilot questions. The exam consists of two parts, each containing 100 questions, with a time allocation of 120 minutes for each part. Also, it includes a scheduled 30-minute break between the two parts. The SRTLE exams are delivered in a multiple-choice format and are intended to assess cognitive learning related to practice-related competencies. All exam questions are computerized.

The exam contains two types of questions. First, recall questions that test knowledge. Second, scenario-based questions that test other skills (interpretation, analysis, decision-making, reasoning, and problem-solving).

#### How is the SRTLE pass score established?

In February 2021, the Central Assessment Committee (CAC) approved a passing score of 530 on the reporting scale of 200-800, which was recommended by the Saudi Radiologic Technologist Licensure Examination Council.

#### What is a test blueprint, and what is its purpose?

A test blueprint is a document that reflects the content of the specialty licensure examination. The blueprint is the plan used for "building" the exam. The blueprint aims to ensure that the included questions relate to the main areas in the specialty in which the candidates are expected to know.



### What is the exam format?

The examination format is based upon sections representing major areas of radiologic technology practice. Within each section, related competencies and sub-competencies are clustered together. When a given competency applies to a series of similar items (such as a list of equipment, procedures, or pathologies), appendices are used to avoid repetition.



## Saudi Radiology Technology Licensure Examination Blueprint

Section	Percentage (%)	Competency
Professional Practice	10%	Professional and Ethical Behavior
		Communication
		Decision making
		Use of resources
		Quality assurance
		Research
Patient Management	15%	Patient interactions
		Patient safety
		Patient assessment and care
Health and Safety	20%	Infection control and materials handling
		Self-protection
		Fire safety
		Radiation safety practices
		Radiation safety education
		Emergency procedures
Operation of Equipment	25%	Principles of radiological technology equipment
		Image acquisition and management
		Equipment quality control
		Image quality
		Other imaging modalities



Procedure Management	30%	Clinical principles
		Imaging procedures
		Pharmaceutical administration
		Apply the knowledge of Pre & Post Procedures
Appendices	<b>Appendix 1</b> Patient interactions <b>Appendix 2</b> Imaging systems <b>Appendix 3</b> Pathologies <b>Appendix 4</b> Imaging procedures <b>Appendix 5</b> Accessory equipment	



Note:

- Blueprint distributions of the examination may differ up to +/-5% in each level.
- For a more specific overview of the areas on the SRTLE, please refer to the Modules and Appendices.



Detailed Content Outline:

Section	Competency
<p style="text-align: center;"><b>Professional Practice</b> <b>(10%)</b></p>	<p><b>A.1 Professional behavior</b></p>
	<p>A.1.1 Present a professional appearance and manner</p>
	<p>A.1.2 Interact respectfully with others</p>
	<p>A.1.3 Provide care in an unbiased manner</p>
	<p>A.1.4 Practice within the areas of your knowledge and skills</p>
	<p>A.1.5 Comply with organizational policies and directives</p>
	<p>A.1.6 Maintain thorough and complete workplace documentation</p>
	<p>A.1.7 Respond professionally to changes impacting the practice environment</p>
	<p>A.1.8 Utilize techniques to manage personal stress in the workplace</p>
	<p>A.1.9 Utilize basic conflict management techniques</p>
	<p>A.1.10 Respond professionally to feedback received from others</p>
	<p>A.1.11 Provide constructive feedback to others</p>
	<p>A.1.12 Engage in reflective practice</p>
	<p>A.1.13 Implement a learning plan to enhance personal knowledge and skills</p>
	<p>A.1.14 Demonstrate basic knowledge of current and emerging issues in health care relevant to the practice</p>
	<p>A.1.15 Demonstrate basic knowledge of current and emerging practices and technological developments in the field</p>
	<p><b>A.2 Communication</b></p>
	<p>A.2.1 Use effective written communication skills</p>
	<p>A.2.2 Use effective oral communication skills</p>
	<p>A.2.3 Use effective interpersonal skills</p>
	<p>A.2.4 Utilize medical terminology in professional communication</p>



<b>Patient Management</b> (15%)	<b>A.3 Decision making</b>	
	A.3.1	Appraise decision options based on best practice evidence, clinical information, resource implications, and other contextual factors
	A.3.2	Use professional judgment to reach decisions
	A.3.3	Take responsibility for decisions and actions
	<b>A.4 Use of resources</b>	
	A.4.1	Prioritize workflow to optimize patient care
	A.4.2	Prioritize workflow to optimize the use of resources
	A.4.3	Monitor inventory of materials and supplies, and respond
	<b>A.5 Quality assurance</b>	
	A.5.1	Maintain awareness of factors in the clinical environment that may affect the delivery of care, and take
	A.5.2	Participate in activities that support a quality assurance program
	A.5.3	Apply principles of risk management
	<b>A.6 Research</b>	
	A.6.1	Demonstrate basic knowledge of research methodology and ethics
	A.6.2	Critically appraise professional literature to assess relevance to practice
	A.6.3	Participate in activities that require the application of research methodology
	<b>B.1 Patient interactions</b>	
	B.1.1	Respect the dignity, religion, culture, privacy, and autonomy of the patient
B.1.2	Provide complete information about procedures to patients and support persons and verify understanding	
B.1.3	Respond to questions from patients and/or support persons or direct them to appropriate personnel	
B.1.4	Ensure ongoing informed consent to procedures	
<b>B.2 Patient safety</b>		
B.2.1	Ensure a safe physical environment	
B.2.2	Verify patient identity	
B.2.3	Verify accuracy and completeness of pre-procedure and post-procedure documentation	



	B.2.4	Transfer and transport the patient safely
	B.2.5	Utilize immobilization devices
	B.2.6	Ensure proper function of patient's supportive devices and equipment
	B.2.7	Assess and respond to any changes in the patient's condition
	B.2.8	Recognize medical emergencies, and respond
	B.2.9	Ensure entry of information to the data archiving system
	<b>B.3 Patient assessment and care</b>	
	B.3.1	Enhance patient comfort
	B.3.2	Review the clinical history provided relative to the requested procedure and address discrepancies
B.3.3	Determine the patient's pregnancy status and respond	
B.3.4	Assess patient for contraindications to procedure and respond	
B.3.5	Assist with the administration of pharmaceuticals	
B.3.6	Provide care for patient's physiological needs	
B.3.7	Provide patient interventions as listed in Appendix 1	
B.3.8	Advise patient of necessary post-procedure follow-up and instructions	
<b>Health and Safety (20%)</b>	<b>C.1 Infection control and materials handling</b>	
	C.1.1	Employ routine practices for infection control
	C.1.2	Employ transmission-based precautions
	C.1.3	Follow standardized procedures for patients with compromised immunity
	C.1.4	Use aseptic techniques
	C.1.5	Use sterile techniques
	C.1.6	Follow standardized procedures for handling and disposing of sharps, and contaminated and biohazardous materials
	C.1.7	Assess the patient for contraindications to contrast media and response
	<b>C.2 Self-protection</b>	
	C.2.1	Utilize protective equipment
	C.2.2	Employ proper body mechanics
	C.2.3	Ensure a safe working environment
	<b>C.3 Fire safety</b>	
	C.3.1	Fire safety management plan
	C.3.2	Implement a fire safety plan
	C.3.3	Observe effective fire safety and prevention measures





	C.3.4	Ensure mandatory fire lectures for staff education
	<b>C.4 Radiation safety practices</b>	
	C.4.1	Apply ALARA principle
	C.4.2	Apply knowledge of radiation effects and risks
	C.4.3	Use protective devices and apparel for personnel
	C.4.4	Implement safe practices to minimize radiation dose to personnel and support persons
	C.4.5	Implement safe practices to minimize radiation dose to patients
	C.4.6	Monitor personal radiation exposure and respond
	C.4.7	Radiation dosimetry
	<b>C.5 Radiation safety education</b>	
C.5.1	Provide education regarding organ sensitivities and safe practices	
C.2.1	Provide information regarding radiation risk and safe practices. e.g. (warning signs)	
<b>C.6 Emergency procedures</b>		
C.6.1	Recognize emergencies involving equipment listed in Appendices 2 & 5 and respond Example: equipment, PACS and RIS down, epidemic phases, disaster codes, etc.	
C.6.2	Recognize conditions requiring urgent action and response	
<b>Operation of Equipment (25%)</b>	<b>D.1 Principles of radiological equipment</b>	
	D.1.1	Understand the principles of radiation physics
	D.1.2	Apply knowledge of operational components of imaging systems listed in Appendix 2
	D.1.3	Understand the principles of radiation interactions and radio-biology
	<b>D.2 Image acquisition and management</b>	
	D.2.1	Operate imaging systems listed in Appendix 2
	D.2.2	Select and optimize parameters for performing a procedure
	D.2.3	Utilize common accessory equipment listed in Appendix 5
	D.2.4	Activate, monitor, and manage image acquisition
	D.2.5	Perform post-processing on acquired image data
	<b>D.3 Equipment quality control</b>	
	D.3.1	Assess the performance of accessory equipment as listed in Appendix 5 and respond
	D.3.2	Assess the performance of imaging equipment as listed in Appendix 2 and respond



	<b>D.4 Image quality</b>
	<p>D.4.1 Apply knowledge of principles affecting image quality</p> <p>D.4.2 Evaluate the diagnostic quality of the image and respond</p> <p>D.4.3 Evaluate images for the purpose of reject analysis</p> <p>D.4.4 Verify visibility and accuracy of radiographic annotations and patient demographics</p> <p>D.4.5 Evaluate images for artifacts and respond</p> <p>D.4.6 Evaluate results to determine if further images are required</p>
<b>Procedure Management (30%)</b>	<b>E.1 Clinical Principles</b>
	E.1.1 Apply knowledge of gross anatomy, relational anatomy, and physiology related to the imaging of anatomical structures
	E.1.2 Differentiate anatomical structure on images
	E.1.3 Apply knowledge of the most common related pathology to each modality in Appendix 3
	E.1.4 Apply knowledge of imaging procedures and protocols listed in Appendix 4 in various clinical environments and modalities
	E.1.5 Apply knowledge of the effects of pharmaceutical agents listed in Appendix 6 as they relate to procedures
	E.1.6 Understand the most common indication/contraindication related to procedures
	E.1.7 Understand the knowledge of patient preparation
	<b>E.2 Imaging procedures</b>
	E.2.1 Plan imaging procedures utilizing data available from clinical information, reports, and previous diagnostic studies
E.2.2 Position patient for imaging procedures as listed in Appendix 4 utilizing anatomical landmarks and relational anatomy	
E.2.3 Adapt positioning in response to patient condition and clinical environment	
E.2.4 Adapt protocol in response to patient condition and clinical environment	
E.2.5 Align imaging system to demonstrate required anatomical structure(s)	
E.2.6 Distinguish patterns consistent with normal results and normal variants	
E.2.7 Recognize patterns consistent with abnormal results and pathologies listed in Appendix 3	



	<b>E.3 Pharmaceutical administration</b>
	E.3.1 Prepare contrast media
	E.3.2 Administer contrast media via the appropriate route
	E.3.3 Prepare and administrate pharmaceutical agents Radiopharmaceuticals agents
<b>Appendices</b>	<b>E.4 Apply the knowledge of Pre and Post Procedures</b>
	E.4.1 Procedure Preparation
	E.4.2 Procedure Precautions (Post)
	Appendix 1 Patient interactions Appendix 2 Imaging systems Appendix 3 Pathologies Appendix 4 Imaging procedures Appendix 5 Accessory equipment

## Appendix:

### Radiological Technology Appendix 1: Patient Interventions

This Appendix lists the patient interventions referred to in competency B.3.7

#### Intervention

- 1.1 Assist with the administration of oxygen
- 1.2 Assist with suctioning
- 1.3 Administer bedpans and urinals
- 1.4 Monitor vital signs
- 1.5 Perform CPR
- 1.6 Insert rectal catheters



## Radiological Technology Appendix 2: Imaging Systems

Equipment Reference Competencies (C.5.1, D.1.2, D.2.1)		Related QC	Specific Quality Control Procedures Reference Competency (D.3.1)	
2.1	General Radiography (including Bone Mineral Densitometry) <ul style="list-style-type: none"> <li>• Radiography</li> <li>• Computed radiography (CR)</li> <li>• Direct radiography (DR)</li> </ul>	→	2.1.1	Environmental inspection
			2.1.2	Visual inspection
			2.1.3	X-Ray beam filtration (half value layer)
			2.1.4	Daily start up and shut down procedures
			2.1.5	X-Ray tube shielding (leakage)
			2.1.6	X-ray beam - Bucky tray (image receptor) alignment
			2.1.7	X-ray beam perpendicularity
			2.1.8	Automatic exposure control (reproducibility and linearity)
			2.1.9	Generator load factors accuracy (kV, loading time, mAs)
			2.1.10	Minimum irradiation time capability (generator)
			2.1.11	Radiation output linearity (generator)
			2.1.12	Radiation output reproducibility (generator)
2.2	<ul style="list-style-type: none"> <li>• Fluoroscopic (radioscopic)</li> <li>• Angiography and Operating Room (C-Arm)</li> </ul>	→	2.2.1	Environmental inspection
			2.2.2	Visual inspection
			2.2.3	X-ray beam filtration (half value layer)
			2.2.4	Daily start-up and shut down procedures
			2.2.5	X-ray tube shielding (leakage radiation)
			2.2.6	Automatic brightness control (ABC)
			2.2.7	Contrast and spatial resolution
			2.2.8	Focal spot to skin distance limitation
			2.2.9	High-level irradiation control activation
			2.2.10	Load factors accuracy
			2.2.11	Maximum air kerma rates
			2.2.12	Radiologic equipment in interventional Radiologic
			2.2.13	Angiographic contrast media
			2.2.14	Imaging and equipment for nonvascular procedures
			2.2.15	Biopsy and drainage equipment
2.3	Computed Tomography (CT)	→	2.3.1	Environmental inspection
			2.3.2	Visual inspection
			2.3.3	X-Ray beam filtration (half value layer)
			2.3.4	X-Ray tube shielding (leakage)
			2.3.5	Contrast resolution
			2.3.6	CT number accuracy
			2.3.7	CT uniformity
			2.3.8	CTDI assessment
			2.3.9	Detector response (kV)
			2.3.10	Image noise
			2.3.11	Image slice thickness
			2.3.12	Laser alignment

			2.3.13	Linearity of CT numbers
			2.3.14	Primary door interlock
			2.3.15	Spatial resolution
			2.3.16	Tube warm up (including tube current verification)
			2.3.17	Daily air calibration
2.4	Magnetic Resonance Imaging	→	2.4.1	Environmental inspection
			2.4.2	Visual inspection
			2.4.3	Basics of magnetism
			2.4.4	Image weighting
			2.4.5	Pulse sequences
			2.4.6	Encoding and image formation
			2.4.7	Parameters and tradeoffs
			2.4.8	Flow and special pulse sequences
			2.4.9	MRI artifacts
			2.4.10	Vascular and cardiac imaging
			2.4.11	Instrumentation and equipment
			2.4.12	MRI safety
2.5	Ultrasonography	→	2.5.1	Physics of sound propagation
			2.5.2	Piezoelectricity and acoustic impedance
			2.5.3	Ultrasound beam and image formation
			2.5.4	Imaging modes
			2.5.5	Doppler ultrasound
			2.5.6	Knobology and instrumentation
			2.5.7	Transducers
			2.5.8	Ultrasound artifacts
			2.5.9	Resolution
			2.5.10	US attenuation
			2.5.11	Image quality
			2.5.12	Safety and biological effects
2.6	Digital networking and archival system	→	2.6.1	Routines as per manufacturer
2.7	Mammography	→	2.7.1	Environmental inspection
			2.7.2	Daily start up and shut down procedures
			2.7.3	Visual inspection
			2.7.4	X-Ray beam filtration (half value layer)
			2.7.5	Compression and detector tests
			2.7.6	Automatic exposure control (reproducibility and linearity)
			2.7.7	Generator load factors accuracy (kV, loading time, mAs)
			2.7.8	Minimum irradiation time capability (generator)
			2.7.9	Radiation output linearity (generator)
			2.7.10	Radiation output reproducibility (generator)
2.8	Bone mineral densitometry	→	2.8.1	Accuracy
			2.8.2	Precision
2.9	Nuclear Medicine	→	2.9.1	Environmental inspection

			2.9.2	Visual inspection
			2.9.3	Atomic and nuclear physics
			2.9.4	Linearity
			2.9.5	Uniformity
			2.9.6	Instrumentation and equipment
			2.9.7	Radioisotopes
			2.9.8	Dose measurement
			2.9.9	Image quality
			2.9.10	Artifacts
			2.9.11	Radiation safety
			2.9.12	Interaction of radiation with matter
			2.9.13	Attenuation correction, Motion corrections, Scattercorrection
			2.9.14	Advantages PET/CT over SPECT/CT and PET-MRI, Positron Emission mammography
			2.9.15	Factors affecting of SUV max value
			2.9.16	Add value Time of Flight
			2.9.17	Labelling Efficiency %
2.10	Other imaging modalities:Radiotherapy	→	2.10.1	Accuracy
			2.10.2	Precision

### Radiological Technology Appendix 3: Pathology

This Appendix lists the pathologies, anomalies, and conditions referred to in competencies E.1.3 and E.2.7

1. Skeletal System		2. Skeletal System (Other)		3. Respiratory System	
3.1.1	Avulsion	3.2.1	Advanced or Delayed bone Age	3.3.1	Asthma
3.1.2	Bennett's	3.2.2	Ankylosing spondylitis	3.3.2	Atelectasis
3.1.3	Bimalleolar	3.2.3	Aseptic necrosis	3.3.3	Bronchiectasis
3.1.4	Blow-out	3.2.4	Cystic bone lesion	3.3.4	Bronchitis
3.1.5	Boxer's	3.2.5	Developmental dysplasia of the hip	3.3.5	Carcinoma of lungs
3.1.6	Closed	3.2.6	Dislocation	3.3.6	Chronic obstructive pulmonary disease (COPD)
3.1.7	Colle's	3.2.7	Gout	3.3.7	Cystic fibrosis
3.1.8	Comminuted	3.2.8	Joint effusion	3.3.8	Emphysema
3.1.9	Complete	3.2.9	Kyphosis	3.3.9	Empyema
3.1.10	Compound	3.2.10	Legge-Calve-Perthe's disease	3.3.10	Epiglottitis, croup
3.1.11	Compression	3.2.11	Lordosis	3.3.11	Foreign body
3.1.12	Contrecoup	3.2.12	Metastatic bone lesions	3.2.12	Hemothorax
3.1.13	Depressed	3.2.13	Multiple myeloma	3.3.13	Lung abscess

3.1.14	Displaced	3.2.14	Osgood Schlatter's disease	3.3.14	Metastasis
3.1.15	Greenstick	3.2.15	Osteogenesis imperfecta	3.3.15	Pleural effusion
3.1.16	Hangman's	3.2.16	Osteoarthritis	3.3.16	Pneumonia
3.1.17	Impacted	3.2.17	Osteomyelitis	3.3.17	Pneumothorax
3.1.18	Incomplete	3.2.18	Osteoporosis	3.3.18	Pulmonary edema
3.1.19	Intertrochanteric	3.2.19	Osteosarcoma	3.3.19	Pulmonary emboli
3.1.20	Linear	3.2.20	Paget's (osteitis deformans)	3.3.20	Pulmonary infarct
3.1.21	Longitudinal	3.1.21	Rheumatoid arthritis	3.3.21	Respiratory distress syndrome – adult and child
3.1.22	March	3.2.22	Scoliosis	3.3.22	Severe acute respiratory syndrome (SARS)
3.1.23	Monteggia	3.2.23	Spina Bifida	3.3.23	Sinusitis
3.1.24	Oblique	3.2.24	Spondylolisthesis	3.3.24	Subcutaneous emphysema
3.1.25	Open	3.2.25	Spondylolysis	3.3.25	Tuberculosis
3.1.26	Pathological	3.2.26	Spondylosis		
3.1.27	Salter-Harris	3.2.27	Subluxation		
3.1.28	Simple				
3.1.29	Smith's				
3.1.30	Spiral				
3.1.31	Supracondylar				
3.1.32	Transverse				
3.1.33	Trimalleolar				
3.1.34	Undisplaced				

4. Gastrointestinal System		5. Urinary System		6. Reproductive	
3.4.1	Achalasia	3.5.1	Adenocarcinoma	3.6.1	Adenocarcinoma of breast
3.4.2	Anemia	3.5.2	Bladder carcinoma	3.6.2	Adenocarcinoma of prostate
3.4.3	Ascites	3.5.3	Calculi	3.6.3	Carcinoma in situ of breast
3.4.4	Bowel obstruction	3.5.4	Cystitis	3.6.4	Fibroadenoma of breast
3.4.5	Carcinoma of stomach	3.5.5	Cysts	3.6.5	Fibrocystic breast
3.4.6	Cholecystitis	3.5.6	Duplication	3.6.6	Infertility (female)
3.4.7	Cholelithiasis	3.5.7	Ectopic kidney	3.6.7	Uterine fibroids
3.4.8	Cirrhosis	3.5.8	Hydronephrosis		
3.4.9	Colorectal cancer	3.5.9	Hydroureter		
3.4.10	Crohn's disease	3.5.10	Metastasis		
3.4.11	Diabetes mellitus	3.5.11	Polycystic kidney		
3.4.12	Diverticulitis	3.5.12	Prostatic		
3.4.13	Dysphasia	3.5.13	Hyperplasia		
3.4.14	Esophageal atresia	3.5.14	Renal failure		
3.4.15	Esophageal carcinoma	3.5.15	Renal hypertension		

3.4.16	Esophageal varices	3.5.16	Vesicouretera
3.4.17	Foreign body		
3.4.18	Gastroesophageal reflux		
3.4.19	Hemangioma		
3.4.20	Hepatitis		
3.4.21	Hiatal hernia Diaphragmatic/Inguinal Hernia		
3.4.22	Hypertrophic pyloric stenosis		
3.4.23	Hypoglycemia		
3.4.24	Ileus		
3.4.25	Intussusception		
3.4.26	Liver cancer		
3.4.27	Pancreatic cancer		
3.4.28	Pancreatitis		
3.4.29	Peptic / duodenal ulcers		
3.4.30	Pneumoperitoneum		
3.4.31	Situs inversus		
3.4.32	Tracheoesophageal fistula		
3.4.33	Ulcerative colitis		
3.4.34	Volvulus		

7. Neurological		8. Cardiovascular		9. Reproductive	
3.7.1	Alzheimer's	3.8.1	Aneurysm	3.9.1	Leukemia
3.7.2	Cerebral hemorrhage – epidural, subdural, subarachnoid	3.8.2	Angina pectoralis	3.9.2	Lymphoma: Hodgkin's and non-Hodgkin's
3.7.3	Cerebrovascular accident (CVA)	3.8.3	Aortic dissection		
3.7.4	Glioma	3.8.4	Aortic stenosis		
3.7.5	Head injuries – concussion, contusion, fractures	3.8.5	Arrhythmias		
3.7.6	Herniated disc	3.8.6	Arteriosclerosis		
3.7.7	Hydrocephaly	3.8.7	Arteriovenous fistula /malformation		
3.7.8	Meningitis	3.8.8	Atherosclerosis		
3.7.9	Metastasis	3.8.9	Congestive heart failure (CHF)		
3.7.10	Parkinson's disease	3.8.10	Coronary artery disease		



3.7.11	Spina bifida	3.8.11	Dextrocardia, septal defects
3.7.12	Transient ischemic attack (TIA)	3.8.12	Embolus
		3.8.13	Hypertension
		3.8.14	Myocardial infarction
		3.8.15	Peripheral vascular disease (PVD)
		3.8.16	Stenosis
		3.8.17	Thrombus

## Radiological Technology Appendix 4: Imaging Procedures

This Appendix lists the imaging procedures referred to in competencies E.1.4 and E.2.2

### Note:

1. AP oblique/PA oblique to describe the projections
2. RPO/LPO and RAO/LAO to describe the position of the patient

Structure		Projection / Position	
	Skeletal system		
4.1	Finger	4.1.1	Posteroanterior (PA)
		4.1.2	Anteroposterior (AP)
		4.1.3	Posteroanterior (PA) oblique
		4.1.4	Lateral
4.2	Thumb	4.2.1	Posteroanterior (PA)
		4.2.2	Anteroposterior (AP)
		4.2.3	Posteroanterior (PA) oblique
		4.2.4	Lateral
4.3	Hand	4.3.1	Posteroanterior (PA)
		4.3.2	Anteroposterior (AP)
		4.3.3	Posteroanterior (PA) oblique
		4.3.4	Anteroposterior (AP) obliques (bilateral)
		4.3.5	Lateral, extension
		4.3.6	Lateral, fan
4.4	Wrist	4.4.1	Posteroanterior (PA)
		4.4.2	Posteroanterior (PA) oblique
		4.4.3	Lateral
4.5	Scaphoid	4.5.1	Posteroanterior (PA) with ulnar deviation
		4.5.2	Posteroanterior (PA) axial
4.6	Forearm	4.6.1	Anteroposterior (AP)
		4.6.2	Lateral
		4.7.1	Anteroposterior (AP)

4.7	Elbow	4.7.2	Anteroposterior (AP) oblique (medial rotation)
		4.7.3	Anteroposterior (AP) oblique (lateral rotation)
		4.7.4	Lateral (routine)
		4.7.5	Laterals (radial head)
		4.7.6	Acute flexion
4.8	Humerus	4.8.1	Anteroposterior (AP)
		4.8.2	Lateral
		4.8.3	Transthoracic lateral
4.9	Shoulder	4.9.1	Anteroposterior (AP) arm neutral rotation
		4.9.2	Anteroposterior (AP) arm external rotation
		4.9.3	Anteroposterior (AP) arm internal rotation
		4.9.4	Anteroposterior (AP) oblique (glenoid)
		4.9.5	Posteroanterior (PA) oblique scapular Y
		4.9.6	Anteroposterior (AP) oblique scapular Y
		4.9.7	Inferosuperior axial
		4.9.8	Superoinferior axial
4.10	Clavicle	4.10.1	Anteroposterior (AP)
		4.10.2	Anteroposterior (AP) axial
4.11	Acromio-clavicular joints	4.11.1	Anteroposterior (AP) with and without weights
4.12	Scapula	4.12.1	Anteroposterior (AP)
		4.12.2	Lateral
4.13	Toes	4.13.1	Anteroposterior (AP)
		4.13.2	Anteroposterior (AP) oblique
		4.13.3	Lateral
4.14	Foot	4.14.1	Anteroposterior (AP) axial
		4.14.2	Anteroposterior (AP) oblique (medial rotation)
		4.14.3	Lateral
		4.14.4	Anteroposterior (AP) axial weight bearing
		4.14.5	Lateral weight bearing
4.15	Ankle	4.15.1	Anteroposterior (AP)
		4.15.2	Anteroposterior (AP) oblique 15 – 20 degree medial rotation
		4.15.3	Lateral
4.16	Calcaneus	4.16.1	Plantodorsal axial
		4.16.2	Lateral
4.17	Tibia and fibula	4.17.1	Anteroposterior (AP)
		4.17.2	Lateral
4.18	Knee	4.18.1	Anteroposterior (AP)
		4.18.2	Posteroanterior (PA)
		4.18.3	Anteroposterior (AP) oblique medial rotation
		4.18.4	Anteroposterior (AP) oblique lateral rotation
		4.18.5	Posteroanterior (PA) oblique medial rotation
		4.18.6	Posteroanterior (PA) oblique lateral rotation
		4.18.7	Lateral
		4.18.8	Anteroposterior (AP) weight bearing
		4.18.9	Anteroposterior (AP) axial (intercondyloid fossa)
		4.18.10	Posteroanterior (PA) axial (intercondyloid fossa)

4.19	Patella	4.19.1	Anteroposterior (AP)
		4.19.2	Posteroanterior (PA)
		4.19.3	Lateral
		4.19.4	Tangential
4.20	Femur	4.20.1	Anteroposterior (AP)
		4.20.2	Lateral
4.21	Hip	4.21.1	Anteroposterior (AP)
		4.21.2	Anteroposterior (AP) (frog legs)
		4.21.3	Lateral (Lauenstein)
		4.21.4	Axiolateral (cross table)
4.22	Pelvis	4.22.1	Anteroposterior (AP)
		4.22.2	Anteroposterior (AP) axial (inlet and outlet)
		4.22.3	Acetabulum anteroposterior (AP) obliques (Judet)
4.23	Cervical vertebrae	4.23.1	Anteroposterior (AP) C1-C2 open mouth
		4.23.2	Anteroposterior (AP) axial
		4.23.3	Lateral
		4.23.4	Posteroanterior (PA) axial obliques - LAO / RAO
		4.23.5	Anteroposterior (AP) axial obliques - LPO / RPO
		4.23.6	Lateral hyperflexion
		4.23.7	Lateral hyperextension
		4.23.8	Lateral cervicothoracic (Swimmers/Twining)
4.24	Thoracic vertebrae	4.24.1	Anteroposterior (AP)
		4.24.2	Lateral
		4.24.3	Lateral cervicothoracic (Swimmers/Twining)
4.25	Lumbar vertebrae	4.25.1	Anteroposterior (AP)
		4.25.2	Lateral
		4.25.3	Posteroanterior (PA) obliques - LAO / RAO
		4.25.4	Anteroposterior (AP) obliques - LPO / RPO
		4.25.5	Lateral L5-S1
4.26	Sacroiliac joints	4.26.1	Anteroposterior (AP) axial
		4.26.2	Anteroposterior (AP) obliques - LPO / RPO
4.27	Sacrum	4.27.1	Anteroposterior (AP) axial
		4.27.2	Lateral
4.28	Coccyx	4.28.1	Anteroposterior (AP) axial
		4.28.2	Lateral
4.29	Scoliosis series	4.29.1	Posteroanterior (PA)
		4.29.2	Lateral
4.30	Sternum	4.30.1	Posteroanterior (PA) oblique - RAO
		4.30.2	Lateral
4.31	Ribs	4.31.1	Anteroposterior (AP)
		4.31.2	Posteroanterior (PA)
		4.31.3	Posteroanterior (PA) obliques
		4.31.4	Anteroposterior (AP) obliques
4.32	Sternoclavicular joints	4.32.1	Posteroanterior (PA)
		4.32.2	Posteroanterior (PA) obliques
4.33	Skull	4.33.1	Anteroposterior (AP) axial (Towne)
		4.33.2	Posteroanterior (PA) axial (Caldwell)
		4.33.3	Lateral

4.34	Sinuses	4.34.1	Parietoacanthial (Waters)
		4.34.2	PA axial (Caldwell)
		4.34.3	Lateral
4.35	Facial bones	4.35.1	Posteroanterior (PA) axial (Caldwell)
		4.35.2	Parietoacanthial (Waters)
		4.35.3	Acanthioparietal (Reverse Waters)
		4.35.4	Lateral
4.36	Orbits	4.36.1	Posteroanterior (PA) axial
		4.36.2	Parietoacanthial (modified Waters)
		4.36.3	Lateral
4.37	Orbits (foreign body)	4.37.1	Parietoacanthial (modified Waters)
		4.37.2	Lateral
4.38	Nasal bones	4.38.1	Parietoacanthial (Waters)
		4.38.2	Lateral
4.39	Zygomatic arches	4.39.1	Parietoacanthial (Waters)
		4.39.2	Tangential
		4.39.3	Anteroposterior (AP) axial (Towne)
		4.39.4	Submentovertical (SMV)
4.40	Mandible	4.40.1	Anteroposterior (AP) axial (modified Towne)
		4.40.2	Posteroanterior (PA) axial
		4.40.3	Anteroposterior (AP)
		4.40.4	Posteroanterior (PA)
		4.40.5	Axiolateral
		4.40.6	Axiolateral obliques
4.41	Temporo-mandibular joints	4.41.1	Anteroposterior (AP) axial (modified Towne)
		4.41.2	Axiolateral (open and closed mouth)
Digestive System			
4.42	Abdomen	4.42.1	Anteroposterior (AP) supine
		4.42.2	Anteroposterior (AP) erect
		4.42.3	Left lateral decubitus
4.43	Esophagus	4.43.1	Anteroposterior (AP)
		4.43.2	Lateral
4.44	Stomach	4.44.1	Anteroposterior (AP)
		4.44.2	Posteroanterior (PA) oblique
		4.44.3	Lateral
4.45	Small bowel	4.45.1	Anteroposterior (AP)
4.46	Large bowel	4.46.1	Anteroposterior (AP) (supine / erect)
		4.46.2	Lateral
		4.46.3	Anteroposterior (AP) oblique
		4.46.4	Posteroanterior (PA) oblique
4.47	ERCP / biliary tree	4.47.1	Anteroposterior (AP)
		4.47.2	Posteroanterior (PA) oblique
		4.47.3	Anteroposterior (AP) oblique
		4.47.4	Lateral
Respiratory System			
4.48	Soft tissue neck	4.48.1	Anteroposterior (AP)
		4.48.2	Lateral
		4.49.1	Anteroposterior (AP) (supine / semi-erect / erect)

4.49	Chest	4.49.2	Posteroanterior (PA)
		4.49.3	Lateral
		4.49.4	Anteroposterior (AP) (lordotic)
		4.49.5	Lateral decubiti
Urinary System			
4.50	Kidney, ureters and bladder (KUB)	4.50.1	Anteroposterior (AP)
Reproductive System			
4.51	Hystero-salpingography	4.51.1	Anteroposterior (AP)
		4.51.2	Anteroposterior (AP) obliques
4.52	Mammography	4.52.1	Craniocaudal
		4.52.2	Mediolateral obliques
4.53	Computed Tomography (routine procedures for...)		
		4.53.1	Abdomen enhanced and unenhanced
		4.53.2	Abdomen for digestive system
		4.53.3	Abdomen for urinary system
		4.53.4	Chest enhanced and unenhanced
		4.53.5	Extremities
		4.53.6	Head enhanced and unenhanced
		4.53.7	Neck enhanced and unenhanced
		4.53.8	Pelvis enhanced and unenhanced
		4.53.9	Spine
4.54	Bone Mineral Densitometry		
		4.54.1	Spine
		4.54.2	Hip
4.55	Interventional Radiologic (various modalities)		
		4.55.1	Angiography
		4.55.2	Angioplasty
		4.55.3	IVC filter
		4.55.4	Embolization
		4.55.5	Thrombolysis
		4.55.6	Stent / shunt placement
		4.55.7	Tube / line insertion
		4.55.8	Joint injection
		4.55.9	Aspiration / drainage
		4.55.10	Biopsy
		4.55.11	Radiofrequency ablation
4.56	Nuclear Medicine Procedures		
		4.56.1	Clinical diagnostic and therapeutic procedures
		4.56.2	Non-imaging procedures



## Radiological Technology Appendix 5: Accessory Equipment

Equipment ( with reference to competency C.5.1, D.2.3)		Related QC	Specific Quality Control Procedures (with reference to competency D.3.2)	
5.1	Beam limiting device (manual; positive beam limitation, PBL)	→	5.1.1	Light field - radiation field congruence
5.2	Grids	→	5.2.1	Alignment
			5.2.2	Uniformity
5.3	Power injector (contrast media) and PET/CT automatic injector	→	5.3.1	Routines as per manufacturer
			5.3.2	PET Automatic Injector
5.4	Protective apparel and devices	→	5.4.1	Integrity

## Radiological Technology Appendix 6: Pharmaceuticals

This Appendix lists the categories of pharmaceuticals referred to in competency E.1.5

	Pharmaceutical Category
6.01	Adrenergic
6.02	Anesthetic
6.03	Antianxiety
6.04	Anticoagulant
6.05	Antidepressant
6.06	Antidiabetic
6.07	Antihistamine
6.08	Anticholinergic
6.09	Antiperistaltic
6.10	Bronchodilator
6.11	Cathartic
6.12	Contrast agent
6.13	Diuretic
6.14	Fluid and electrolytes
6.15	Glucocorticoid / NSAID
6.16	Hypoglycemic
6.17	Narcotics
6.18	Sedative
6.19	Tranquilizer
6.20	Vasodilator




## Appendix 7: References

Section	Reference
<p>Section A: Professional Practice</p>	<ul style="list-style-type: none"> <li>• Bontrager's Textbook of Radiographic Positioning and Related Anatomy, 9th Edition, John Lampignano, and Leslie E. Kendrick, Mosby Publisher, Philadelphia, PA, USA, 2017. ISBN 9780323399661</li> <li>• Bruce W. Long MS RT(R)(CV) FASRT (Author), Eugene D. Frank MA RT(R) FASRT FAEIRS (Author), Ruth Ann Ehrlich RT(R) (Author)</li> <li>• Radiography Essentials for Limited Practice 5th Edition ISBN-13: 978-0323356237</li> <li>• Introduction to Radiologic and Imaging Sciences and Patient Care 6th Edition, Arlene M. Adler, Richard R. Carlton, Saunders Publisher, Philadelphia, PA, USA, 2015. ISBN 978-0323315791</li> <li>• Health Professions Council (HPC) Standards of Conduct, Performance and Ethics.</li> <li>• London: HPC. Available at: <a href="https://www.hpc-uk.org/standards/standards-of-conduct-performance-and-ethics/">https://www.hpc-uk.org/standards/standards-of-conduct-performance-and-ethics/</a>. Accessed November 20, 2019</li> </ul>
<p>Section B: Patient Management</p>	<ul style="list-style-type: none"> <li>• Medical Ethics &amp; Patient Care (Text book)</li> <li>• Principles of Health Care Ethics (Text book)</li> <li>• Code of Ethics for Healthcare Practitioners (by SCFHS)</li> </ul>
<p>Section C: Health and Safety</p>	<ul style="list-style-type: none"> <li>• <a href="https://camrt-bpg.ca/index/">https://camrt-bpg.ca/index/</a></li> <li>• Sherer, M.S. Visconti, P.J., et al. "Radiation Protection in Medical radiography", 8th edition. Mosby, 2018 ISBN:978-0-323-44666-2</li> <li>• Torres, L.S. Dutton, A.G., Linn-Watson, T. "Patient care in Imaging Technology", 9th edition. Lippincott &amp; Wilkins, 2018 ISBN 9781496378668</li> <li>• <a href="https://www.canada.ca/en/services/health/publications/health-risks-safety.html">https://www.canada.ca/en/services/health/publications/health-risks-safety.html</a></li> <li>• National &amp; International Regulatory Bodies: <ul style="list-style-type: none"> <li>• SFDA</li> <li>• National Commission of Nuclear and radiation commission</li> <li>• CBAHI</li> <li>• Patient safety authority</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• MOH</li> <li>• JCI</li> </ul>
<p>Section D: Operation of Equipment</p>	<ul style="list-style-type: none"> <li>• Bontrager's- Textbook of Radiographic Positioning and Related Anatomy</li> <li>• Gurley's- Introduction to Radiologic Technology)</li> <li>• Bushong's- Radiologic science for technologists: Physics, biology, and protection</li> <li>• Bates'- Abdominal ultrasound- why how and when</li> <li>• McRobbie D., Moore E., Graves M., and Prince M. (2018) - MRI from Picture to Proton</li> <li>• Westbrook C., and Talbot J. - MRI in Practice</li> <li>• Adler, Arlene, Carlton, Richard- Principles of Radiographic Imaging, an Art and a Science</li> <li>• Romans, Lois E. Computed Tomography for Technologists</li> <li>• Westbrook, Catherine, Handbook of MRI Technique</li> <li>• Bernier's Nuclear Medicine: Technology and Techniques</li> </ul>
<p>Section E: Procedure Management</p>	<ul style="list-style-type: none"> <li>• X-Ray Technician (Passbooks) (Career Examination Passbooks)</li> <li>• Workbook for Merrill's Atlas of Radiographic Positioning and Procedures, 14<sup>th</sup> Edition</li> <li>• Computed Tomography for Technologists: Exam Review. Second Edition</li> <li>• CT &amp; MRI Pathology: A Pocket Atlas</li> <li>• Radiographic and Angiographic Procedures with an Introduction to Specialized Imaging. FA Davis</li> <li>• Nuclear Medicine Technology: Procedures and Quick Reference. Pete Shackett. Third Edition, 2019</li> <li>• Steves' Review of Nuclear Medicine Technology: Preparation for Certification</li> <li>• Examinations. Norman E. Bolus. 4th Edition, 2011</li> <li>• Abdominal Ultrasound: step by step. Berthhold block. 3rd edition</li> <li>• Abdominal and small parts sonography: A comprehensive study. By RT Barbara</li> <li>• MRI in Practice, Catherine Westbrook</li> </ul>





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- Handbook of MRI Technique
  - Patient Care in Radiography: With an Introduction to Medical Imaging
  - Comprehensive Radiographic Pathology



**Note:** This list is intended for use as a study aid only. SCFHS does not intend the list to imply endorsement of these specific references, nor are the exam questions necessarily taken from these sources.



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