

Forensic Radiography Educational Framework

*Sponsored by the American Society of Radiologic Technologists, 15000 Central Ave. SE,
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Introduction

Conducting examinations that use ionizing radiation to gather and analyze forensic evidence constitutes forensic radiography, an academic and scientific discipline. In 2007, the ASRT convened a task force to discuss and investigate the state of forensic radiography in the United States and the role of the professional organization in improving the quality of forensic imaging.

This educational framework is a result of the task force's work. It was developed by a committee of educators and forensic radiology practitioners to ensure safe and quality practice of forensic radiography. The committee recognized that personnel performing forensic radiology examinations follow three basic paths; this framework is designed to complement each of those paths:

1. Registered technologist.
2. Limited x-ray machine operator, or LXMO.
3. Forensic assistant (usually assistant to a forensic pathologist or medical examiner; for the purposes of this document, this term also is used to refer to any personnel in medical examiner and coroner offices or forensic laboratories, including morgue assistants, laboratory clerks and pathologists).

Although forensic assistants perform imaging tasks within a limited scope, the developers of the educational framework believe that the knowledge and cognitive skills underlying the safe and accurate performance of the forensic radiography examination must be equivalent to that of the registered technologist. Operation of equipment that emits ionizing radiation presents concerns regarding safety of operators and personnel near the equipment, as well as quality assurance issues, regardless of the equipment's purpose. The content is designed with special attention to proper radiation protection and production of quality images. Image quality not only is important to producing credible evidence in criminal and civil cases, but for comparing postmortem images to antemortem images in cases of autopsy and identification.

The framework also provides educational content for radiographers to gain knowledge specific to forensic sciences, such as law, evidence collection and administrative proceedings. At any given

time, a radiologic technologist practicing in a hospital or imaging center may perform a forensic examination. The nature of a patient’s injuries and circumstances mean that the examination findings may be critical legal evidence. The framework helps LXMOs identify skills gaps in radiography and forensics.

The educational framework committee acknowledged that each individual will require varying amounts and types of additional education, depending on his or her background, skills and experience. The gap analysis provides the opportunity to identify educational needs for professionals in each of the three basic paths. Check marks indicate elements associated with forensic radiography that are present in existing curriculum documents and/or found in existing educational programs of the specialties indicated. Elements that are not checked for a given specialty are intended as a guide for the development of educational pathways (see the example below).

Radiation Protection	R.T.	LXMO	F.A.
I. Introduction			
A. Justification for radiation protection	☑	☑	
B. Potential biologic damage of ionizing radiation	☑	☑	
C. Objectives of a radiation protection program	☑	☑	
D. Sources of radiation	☑	☑	
E. Legal and ethical responsibilities	☑	☑	

Proposed minimum hours of didactic instruction and clinical experience have been included as guidelines to assist in program planning. Faculty members are encouraged to expand and broaden these fundamental objectives as they incorporate them into their curricula. Specific instructional methods, course level, course length and number of courses or units intentionally were omitted to allow for programmatic prerogative as well as creativity in instructional delivery. Resources are included to assist faculty members in program planning.

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Gap Analysis

Digital Image Acquisition and Display	R.T.	LXMO	F.A.
I. Basic Principles of Digital Radiography			
A. Digital image characteristics	<input checked="" type="checkbox"/>		
B. Digital receptors	<input checked="" type="checkbox"/>		
II. Image Acquisition Errors			
A. Scatter control	<input checked="" type="checkbox"/>		
III. Fundamental Principles of Exposure			
A. Optimal receptor exposure	<input checked="" type="checkbox"/>		
B. Receptor response – detective quantum efficiency (DQE)	<input checked="" type="checkbox"/>		
C. Control patient exposure	<input checked="" type="checkbox"/>		
D. Monitor patient exposure	<input checked="" type="checkbox"/>		
IV. Image Evaluation			
A. Exposure level	<input checked="" type="checkbox"/>		
B. Contrast	<input checked="" type="checkbox"/>		
C. Recorded detail	<input checked="" type="checkbox"/>		
D. Artifacts	<input checked="" type="checkbox"/>		
V. PACS	<input checked="" type="checkbox"/>		
A. Terminology	<input checked="" type="checkbox"/>		
B. System components and function	<input checked="" type="checkbox"/>		
C. Digital imaging in communications and medicine (DICOM)	<input checked="" type="checkbox"/>		
Film-screen Image Production and Evaluation			
I. Imaging Quality Standards			
A. Pathologist's involvement in setting image standards	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Care and security of evidence concerns	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Procedures for maintaining image standards	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<p>Check marks indicate elements of forensic radiography in existing curricula or existing educational programs of the designated specialty. Unchecked elements for a given specialty are intended to guide in developing educational pathways. R.T., radiologic technologist; LXMO, limited x-ray machine operator; F.A., forensic assistant.</p>			

	R.T.	LXMO	F.A.
II. Radiographic Density			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Acceptable range	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Factors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Radiographic Contrast			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Types	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Components	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Factors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IV. Recorded Detail			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Components	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Factors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
V. Distortion			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Types	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Factors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VI. Exposure Latitude			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Factors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Beam-limiting Devices			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Purposes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Types, function and application of each	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Beam Filtration			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Rationale	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Composition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
D. Types	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Image quality	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Patient exposure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IX. Scattered and Secondary Radiation			
A. Definitions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Factors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Effects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Control of Exit/Remnant Radiation			
A. kVp selection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Grids	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Technique Formulation			
A. Purpose	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Considerations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Types	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
XII. Exposure Calculations			
A. Factors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Calculations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
XIII. Image Receptor Handling and Storage			
A. Processing considerations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Storage considerations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
XIV. Characteristics of Image Receptors			
A. Film Types	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Composition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Definition, influence and application of image receptor properties	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Digital systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Characteristic curves	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
XV. Image Receptor Holders and Intensifying Screens			
A. Image receptor holders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Intensifying screens	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
XVI. Processing of the Images			
A. Darkroom lighting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Processor systems/functions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Processing cycle	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Maintenance/cleaning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
XVII. Digital Processing			
A. Algorithms	<input checked="" type="checkbox"/>		
B. Histograms	<input checked="" type="checkbox"/>		
C. Resolution	<input checked="" type="checkbox"/>		
D. Postprocessing	<input checked="" type="checkbox"/>		
E. Exposure indicator (patient dose)	<input checked="" type="checkbox"/>		
VIII. Artifacts			
A. Definition	<input checked="" type="checkbox"/>		
B. Types	<input checked="" type="checkbox"/>		
C. Causes	<input checked="" type="checkbox"/>		
D. Effects	<input checked="" type="checkbox"/>		
E. Preventive/corrective maintenance	<input checked="" type="checkbox"/>		
XIX. Imaging Standards			
A. Purpose	<input checked="" type="checkbox"/>		
B. Problem-solving process	<input checked="" type="checkbox"/>		
C. Establishing acceptable limits	<input checked="" type="checkbox"/>		
XX. Image Quality Factors			
A. Density	<input checked="" type="checkbox"/>		
B. Contrast	<input checked="" type="checkbox"/>		
C. Recorded detail	<input checked="" type="checkbox"/>		
D. Distortion	<input checked="" type="checkbox"/>		
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	R.T.	LXMO	F.A.
E. Automatic exposure control	<input checked="" type="checkbox"/>		
F. Processing	<input checked="" type="checkbox"/>		
G. Computed radiography (CR)	<input checked="" type="checkbox"/>		
H. Digital radiography (DR)	<input checked="" type="checkbox"/>		
XXI. Procedural Factors			
A. Image identification	<input checked="" type="checkbox"/>		
B. Positioning	<input checked="" type="checkbox"/>		
C. Centering	<input checked="" type="checkbox"/>		
D. Radiation protection	<input checked="" type="checkbox"/>		
E. Patient preparation	<input checked="" type="checkbox"/>		
F. Artifacts	<input checked="" type="checkbox"/>		
XII. Corrective Action			
A. Equipment	<input checked="" type="checkbox"/>		
B. Technical factors	<input checked="" type="checkbox"/>		
C. Procedural factors	<input checked="" type="checkbox"/>		
D. Artifacts	<input checked="" type="checkbox"/>		
Fluoroscopic Unit Operation and Safety			
I. X-ray Tubes			
A. Construction	<input checked="" type="checkbox"/>		
B. Extending tube life	<input checked="" type="checkbox"/>		
II. Components of the Fixed Fluoroscopic Unit			
A. Table	<input checked="" type="checkbox"/>		
B. Radiation source	<input checked="" type="checkbox"/>		
C. Image intensifier carriage	<input checked="" type="checkbox"/>		
D. Image intensifier construction	<input checked="" type="checkbox"/>		
E. Intensification principles/characteristics	<input checked="" type="checkbox"/>		
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	R.T.	LXMO	F.A.
F. Viewing and recording systems	<input checked="" type="checkbox"/>		
G. Digital fluoroscopy	<input checked="" type="checkbox"/>		
III. Components of the Mobile Fluoroscopic Unit			
A. Control panel	<input checked="" type="checkbox"/>		
B. Radiation source	<input checked="" type="checkbox"/>		
C. Image intensifier/ flat panel detector	<input checked="" type="checkbox"/>		
D. Optics system	<input checked="" type="checkbox"/>		
E. Video interface	<input checked="" type="checkbox"/>		
F. Locks and angle indicators	<input checked="" type="checkbox"/>		
G. Equipment provisions	<input checked="" type="checkbox"/>		
H. Limiting the use of “high level control” or “boost position” during fluoroscopy	<input checked="" type="checkbox"/>		
I. Personnel monitoring of radiation exposure	<input checked="" type="checkbox"/>		
IV. Technical Factors Affecting the Radiation Dose Rate for Patients and Operators			
A. Direct factors	<input checked="" type="checkbox"/>		
B. Indirect factors	<input checked="" type="checkbox"/>		
C. Patient and/or operator dose reducers	<input checked="" type="checkbox"/>		
D. Image intensifiers and flat panel detectors	<input checked="" type="checkbox"/>		
V. Operator Controls of the Fluoroscopic Unit			
A. Control panel setting(s) for fluoroscopy vs. dose	<input checked="" type="checkbox"/>		
B. Collimator control	<input checked="" type="checkbox"/>		
C. Compression devices	<input checked="" type="checkbox"/>		
D. Fluoro grid device	<input checked="" type="checkbox"/>		
E. Exposure switch(es)	<input checked="" type="checkbox"/>		
F. Spot film device	<input checked="" type="checkbox"/>		
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	R.T.	LXMO	F.A.
VI. Personnel Protection			
A. Personnel radiation protection	<input checked="" type="checkbox"/>		
B. Protective apparel and accessories	<input checked="" type="checkbox"/>		
C. Other safety hazards	<input checked="" type="checkbox"/>		
Fundamentals, Ethics and Law of Health Care			
I. The Health Science Professions			
A. Radiologic technology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Health care professions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
II. The Health Care Environment			
A. Health care systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Health care delivery settings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Payment/reimbursement systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Facility Organization			
A. Philosophy and mission	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Administrative services	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Medical services	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IV. Radiology Organization			
A. Professional personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Support personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Patient services	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
V. Accreditation			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Institution accreditation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Programmatic accreditation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VI. Professional Credentialing			
A. Definition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Agencies	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
VII. Professional Organizations			
A. Purpose, function, activities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Local organizations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. State organizations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. National	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. International	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Related associations, organizations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Professional Development			
A. Methods of advancement	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Employment considerations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Additional career ladders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Continuing education and competency requirements	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IX. Ethics in Health Care			
A. Moral reasoning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Personal behavior standards	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Competence	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Professional attributes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Limited scope of practice defined	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Self-assessment and self-governance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
G. Continuing professional education	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
H. Professional standards of clinical practice	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
I. Code of professional ethics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
J. Ethical principles	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
K. Organizational ethics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
L. Individual and societal rights	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
M. Autonomy vs. behavior control	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
N. Medical/health care research	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
O. Ethical decision making	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
X. Legal Responsibilities			
A. Parameters of legal responsibility	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Scope of practice and responsibilities of the forensic assistant	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Human Structure and Function			
I. Anatomical Nomenclature			
A. Terms of direction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Body planes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Body cavities – structural limits, function, contents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
II. Landmarks and Underlying Anatomy			
A. Cranium	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Neck	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Spine	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Thorax	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Abdomen	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Pelvis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
G. Extremities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Skeletal System			
A. Osseous tissue	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Divisions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Articulations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IV. Cardiovascular System			
A. Blood	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Heart and vessels	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
V. Respiratory System			
A. Components and structure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Physiology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
VI. Abdomen			
A. Digestive system	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Urinary system – structure, function and location	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Reproductive systems – structure, function and location	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Muscular System – Types, Characteristics and Functions			
A. Smooth	<input checked="" type="checkbox"/>		
B. Cardiac	<input checked="" type="checkbox"/>		
C. Skeletal	<input checked="" type="checkbox"/>		
VIII. Nervous System			
A. Introduction	<input checked="" type="checkbox"/>		
B. Neural tissue	<input checked="" type="checkbox"/>		
C. Anatomy, functions	<input checked="" type="checkbox"/>		
Imaging Equipment and Radiation Production			
I. X-ray Circuit			
A. Electricity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Protective devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Transformers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Rectification	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
II. Radiographic Equipment			
A. Permanent installation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. AEC devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Diagnostic X-ray Tubes			
A. Design and function	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Extending tube life	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
IV. Electronic Imaging			
A. Purpose	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Principles	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Flat panel detectors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
V. Quality Control			
A. Definitions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Benefits	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VI. Structure of the Atom			
A. Nucleus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Structure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Electron shells	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Nature of Radiation			
A. Natural background radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Artificial radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. X-ray Production			
A. Historical introduction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Principles	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Types	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Common terms related to the x-ray beam	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Conditions necessary for production	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. X-ray emission spectra	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
G. Factors affecting emission spectra	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
H. Efficiency in production	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IX. Interaction of Photons With Matter			
A. Transmission of photons	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Unmodified scattering (coherent)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Photoelectric effect	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Modified scattering (Compton)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
Legal Proceedings			
I. Admissibility of Scientific Evidence			<input checked="" type="checkbox"/>
II. Federal Rules of Evidence			<input checked="" type="checkbox"/>
III. The Expert Witness			<input checked="" type="checkbox"/>
IV. Discovery and Deposition			<input checked="" type="checkbox"/>
V. Testimony in Court			<input checked="" type="checkbox"/>
VI. Admissibility of Radiological Images and Results			<input checked="" type="checkbox"/>
Medical Terminology			
I. The Word-building Process			
A. Basic elements	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Parts of speech	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Translation of terms into common language	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Correct pronunciation of medical terms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Medical Abbreviations and Symbols			
A. Role in communications	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Abbreviations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Symbols	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Radiologic Technology Procedures and Terminology			
A. Radiography	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Radiation oncology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Nuclear medicine	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Sonography	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Check marks indicate elements of forensic radiography in existing curricula or existing educational programs of the designated specialty. Unchecked elements for a given specialty are intended to guide in developing educational pathways. R.T., radiologic technologist; LXMO, limited x-ray machine operator; F.A., forensic assistant.			

	R.T.	LXMO	F.A.
IX. Understanding Orders, Requests and Diagnostic Reports			
A. Radiographic orders and requisitions – components	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Diagnostic reports	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Patient Care in Forensic Science			
I. Forensic Assistants and Health Care Team			
A. Responsibilities of the health care facility	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B. Responsibilities of the forensic assistant			<input checked="" type="checkbox"/>
II. Attitudes and Communication in Patient Care			
A. Health-illness continuum	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Age-specific communication	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Communication	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Psychological considerations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Patient/Forensic Assistant Interactions			
A. Patient identification methods	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
IV. Safety and Transfer Positioning			
A. Environmental safety	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Body mechanics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Patient transfer and movement	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Patient positions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Immobilization techniques	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Accident and incident reporting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
V. Patient Records			
A. Aspects of patient records	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B. Confidentiality of patient information	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C. Retrieving specific information	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Check marks indicate elements of forensic radiography in existing curricula or existing educational programs of the designated specialty. Unchecked elements for a given specialty are intended to guide in developing educational pathways. R.T., radiologic technologist; LXMO, limited x-ray machine operator; F.A., forensic assistant.			

	R.T.	LXMO	F.A.
D. Proper documentation in patient record	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E. Health Insurance Portability and Accountability Act (HIPAA)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VI. Infection Control			
A. Terminology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Centers for Disease Control and Prevention (CDC)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Cycle of infection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Preventing disease transmission	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Medical asepsis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Environmental asepsis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
G. Standard precautions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Values			
A. Personal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Professional	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Patient Centered Quality Care for All			
A. Societal and individual factors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Principles of Computed Tomography (CT)			
I. Radiation Protection			
A. Personal protection and monitoring	<input checked="" type="checkbox"/>		
B. Area/facilities monitoring	<input checked="" type="checkbox"/>		
C. Medical events	<input checked="" type="checkbox"/>		
II. The CT Computer			
A. Hardware	<input checked="" type="checkbox"/>		
B. Data acquisition system	<input checked="" type="checkbox"/>		
C. Software	<input checked="" type="checkbox"/>		
D. Algorithms	<input checked="" type="checkbox"/>		
E. Postprocessing techniques	<input checked="" type="checkbox"/>		
Check marks indicate elements of forensic radiography in existing curricula or existing educational programs of the designated specialty. Unchecked elements for a given specialty are intended to guide in developing educational pathways. R.T., radiologic technologist; LXMO, limited x-ray machine operator; F.A., forensic assistant.			

	R.T.	LXMO	F.A.
F. Keyboard orientation	<input checked="" type="checkbox"/>		
G. Peripheral device orientation	<input checked="" type="checkbox"/>		
H. Image display, manipulation, recording and archiving	<input checked="" type="checkbox"/>		
III. Image Quality in CT			
A. Definition	<input checked="" type="checkbox"/>		
B. Determinants	<input checked="" type="checkbox"/>		
C. Influencing factors	<input checked="" type="checkbox"/>		
D. Measurements	<input checked="" type="checkbox"/>		
E. Quality control programs in CT	<input checked="" type="checkbox"/>		
IV. Computed Tomography Process			
A. Single-slice scanners	<input checked="" type="checkbox"/>		
B. Multislice scanners	<input checked="" type="checkbox"/>		
C. Spiral scanners	<input checked="" type="checkbox"/>		
D. Electron beam scanners	<input checked="" type="checkbox"/>		
V. Spiral Computed Tomography			
A. Definition	<input checked="" type="checkbox"/>		
B. Scanner design	<input checked="" type="checkbox"/>		
C. Composite and wire brush scanners	<input checked="" type="checkbox"/>		
VI. Physics/Instrumentation (System Operation and Components)			
A. Selectable scan factors	<input checked="" type="checkbox"/>		
B. Data management	<input checked="" type="checkbox"/>		
C. Image quality	<input checked="" type="checkbox"/>		
VII. CT, Applied Terminology			
A. Pixel	<input checked="" type="checkbox"/>		
B. Matrix	<input checked="" type="checkbox"/>		
C. Voxel	<input checked="" type="checkbox"/>		
Check marks indicate elements of forensic radiography in existing curricula or existing educational programs of the designated specialty. Unchecked elements for a given specialty are intended to guide in developing educational pathways. R.T., radiologic technologist; LXMO, limited x-ray machine operator; F.A., forensic assistant.			

	R.T.	LXMO	F.A.
D. X, y, z coordinates	<input checked="" type="checkbox"/>		
E. Scan field of view (SFOV)	<input checked="" type="checkbox"/>		
F. Display field of view (DFOV)	<input checked="" type="checkbox"/>		
G. Linear attenuation coefficient	<input checked="" type="checkbox"/>		
H. CT/Hounsfield number	<input checked="" type="checkbox"/>		
I. Partial volume averaging	<input checked="" type="checkbox"/>		
J. Window width (WW) and window level (WL)	<input checked="" type="checkbox"/>		
K. Spatial resolution	<input checked="" type="checkbox"/>		
L. Contrast resolution	<input checked="" type="checkbox"/>		
M. Noise aliasing	<input checked="" type="checkbox"/>		
N. Digital imaging	<input checked="" type="checkbox"/>		
O. Annotation	<input checked="" type="checkbox"/>		
P. Scanogram	<input checked="" type="checkbox"/>		
Q. Region of interest (ROI)	<input checked="" type="checkbox"/>		
R. Standard vs. volumetric data acquisition	<input checked="" type="checkbox"/>		
S. Half-scan, full-scan, overscan	<input checked="" type="checkbox"/>		
T. Interscan delay	<input checked="" type="checkbox"/>		
U. Rays and views	<input checked="" type="checkbox"/>		
V. Sampling (angular and ray)	<input checked="" type="checkbox"/>		
VIII. Cross-sectional Anatomy (Multiplane) With Pathologic Correlation			
A. Head	<input checked="" type="checkbox"/>		
B. Neck	<input checked="" type="checkbox"/>		
C. Spine	<input checked="" type="checkbox"/>		
D. Thorax	<input checked="" type="checkbox"/>		
E. Abdomen	<input checked="" type="checkbox"/>		
F. Pelvis	<input checked="" type="checkbox"/>		
Check marks indicate elements of forensic radiography in existing curricula or existing educational programs of the designated specialty. Unchecked elements for a given specialty are intended to guide in developing educational pathways. R.T., radiologic technologist; LXMO, limited x-ray machine operator; F.A., forensic assistant.			

	R.T.	LXMO	F.A.
IX. Procedures Protocol			
A. Indicators for specific protocols	<input checked="" type="checkbox"/>		
B. Contraindications for specific protocol	<input checked="" type="checkbox"/>		
C. Indications for contrast media	<input checked="" type="checkbox"/>		
D. Contraindications to the use of contrast media	<input checked="" type="checkbox"/>		
E. Patient preparation	<input checked="" type="checkbox"/>		
F. Charting	<input checked="" type="checkbox"/>		
G. Protocol parameters	<input checked="" type="checkbox"/>		
X. Procedures (CT)			
A. Head	<input checked="" type="checkbox"/>		
B. Neck	<input checked="" type="checkbox"/>		
C. Spine	<input checked="" type="checkbox"/>		
D. Thorax	<input checked="" type="checkbox"/>		
E. Abdomen	<input checked="" type="checkbox"/>		
F. Pelvis	<input checked="" type="checkbox"/>		
Radiation Biology			
I. Introduction			
A. Molecule	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Review of cell biology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Types of ionizing radiations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
II. Biophysical Events			
A. Molecular effects of radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. The deposition of radiant energy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Radiation Effects			
A. Subcellular radiation effects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Cellular radiation effects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Individual radiation effects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Factors influencing radiation response	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
IV. Radiosensitivity and Response			
A. Law of Bergonié and Tribondeau	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Cell survival and recovery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Systemic response to radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Radiation dose-response curves	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Total body irradiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Late effects of radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
G. Risk estimates	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Radiation Protection			
I. Introduction			
A. Justification for radiation protection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Potential biologic damage of ionizing radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Objectives of a radiation protection program	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Sources of radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Legal and ethical responsibilities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
II. Units, Detection and Measurement			
A. Radiation units	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Dose reporting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Personnel Monitoring			
A. Historical perspective	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Requirements for personnel monitoring	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Methods and types of personnel monitors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Records of accumulated dose	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Dose limits – 10 CFR part 20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Responsibilities for radiation protection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IV. Application			
A. Design	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Regulations and recommendations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
C. Cardinal principles in protection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Emergency procedures	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Radiographic Procedures of the Forensic Assistant			
I. Standard Terminology for Positioning and Projection			
A. Standard terms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Positioning terminology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. General planes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Terminology of movement and direction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Positioning aids	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Accessory equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
II. Evaluation of Radiographic Orders			
A. Patient identification	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B. Verification of procedure(s) ordered	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C. Review of clinical history	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D. Special considerations for age, disability and cultural background	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E. Patient preparation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F. Room preparation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
III. Positioning Considerations for Routine Radiographic Procedures			
A. Patient positioning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Image receptor selection and placement	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Appropriate grid use	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Beam alignment and angulation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Beam limitation and shielding	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Special considerations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	R.T.	LXMO	F.A.
G. Anatomy and positioning for the following studies:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1. Chest and thorax	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Extremities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Podiatric	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Vertebral column	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Cranium	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
H. Image evaluation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IV. Contrast Media			
A. Rationale for use	<input checked="" type="checkbox"/>		
B. Agents	<input checked="" type="checkbox"/>		
C. Contrast preparations	<input checked="" type="checkbox"/>		
D. Media in Use	<input checked="" type="checkbox"/>		
V. Definitions/Terminology			
A. Pathology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Disease	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Etiology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Diagnosis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
E. Prognosis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VI. Relevance to Radiographic Procedures			
A. Purpose of the procedure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
B. Manifestations of pathology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C. Technical considerations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D. Radiographic appearance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Imaging for Investigative Procedures			
A. Basal skull			<input checked="" type="checkbox"/>
B. Burned remains			<input checked="" type="checkbox"/>
C. Decomposed body			<input checked="" type="checkbox"/>
Check marks indicate elements of forensic radiography in existing curricula or existing educational programs of the designated specialty. Unchecked elements for a given specialty are intended to guide in developing educational pathways. R.T., radiologic technologist; LXMO, limited x-ray machine operator; F.A., forensic assistant.			

	R.T.	LXMO	F.A.
D. Gunshot wounds			<input checked="" type="checkbox"/>
E. Intraoral investigation			<input checked="" type="checkbox"/>
F. Missile identification			<input checked="" type="checkbox"/>
G. Motor vehicle accidents			<input checked="" type="checkbox"/>
H. Removal of artifacts			<input checked="" type="checkbox"/>
I. Skeletal remains			<input checked="" type="checkbox"/>
J. Unidentified corpse			<input checked="" type="checkbox"/>
Scope of Forensic Radiology			
I. Service			<input checked="" type="checkbox"/>
II. Education			<input checked="" type="checkbox"/>
III. Concerns of Public Health and Safety			<input checked="" type="checkbox"/>
IV. Mass Casualty			<input checked="" type="checkbox"/>
V. Child Abuse			<input checked="" type="checkbox"/>
VI. Research			<input checked="" type="checkbox"/>
VII. Domestic Abuse			<input checked="" type="checkbox"/>
VIII. Abuse of the Elderly			<input checked="" type="checkbox"/>
IX. Human Rights Abuse, Torture, Terrorism			<input checked="" type="checkbox"/>
Check marks indicate elements of forensic radiography in existing curricula or existing educational programs of the designated specialty. Unchecked elements for a given specialty are intended to guide in developing educational pathways. R.T., radiologic technologist; LXMO, limited x-ray machine operator; F.A., forensic assistant.			

Descriptions

Digital Image Acquisition and Display

Content is designed to impart an understanding of the components, principles and operation of cassette-based and cassette-less imaging systems found in radiology. Factors that affect image acquisition, display, archiving and retrieval are discussed.

Proposed minimum hours of instruction: 40

Film-screen Image Production and Evaluation

Content is designed to establish a knowledge base in factors that govern and influence the production and recording of radiologic images. Film-screen imaging with related accessories will be emphasized. Radiographic image analysis methods will be introduced using actual images. Included are the importance of minimum imaging standards, discussion of a problem-solving technique for image evaluation and the factors that can affect image quality.

Proposed minimum hours of instruction: 50

Fluoroscopic Unit Operation and Safety

Content promotes the conscientious operation of the fluoroscopic device. Analysis of the functional components of fixed and mobile fluoroscopic devices heightens operator awareness of the features and limitations of this imaging medium. Procedures and techniques to optimize image quality while reducing potential radiation exposure to operator and ancillary personnel are included.

Proposed minimum hours of instruction: 10

Fundamentals, Ethics and Law of Health Care

Content is designed to provide an overview of the foundations in radiologic science. The elements of ethical behavior will be discussed, as well as a variety of ethical issues and dilemmas found in clinical practice. An introduction to legal terminology, concepts and principles also will be presented. Topics include misconduct, malpractice, legal and professional standards. The importance of proper documentation and consent is emphasized.

Proposed minimum hours of instruction: 8

Human Structure and Function

Content is designed to establish a knowledge base in anatomy and physiology. Components of the cells, tissues, organs and systems will be described and discussed.

Proposed minimum hours of instruction: 25

Imaging Equipment and Radiation Production

Content is designed to establish a knowledge base in radiographic equipment and x-ray production. Topics include atomic structure, the nature and characteristics of radiation and the fundamentals of photon interactions with matter.

Proposed minimum hours of instruction: 40

Medical Terminology

Content is designed to provide an introduction to the origins of medical terminology. A word-building system will be introduced, and abbreviations and symbols will be discussed. Also introduced will be an orientation to the understanding of radiographic orders and interpretation of diagnostic reports. Related terminology is addressed.

Proposed minimum hours of instruction: 10

Patient Care in Forensic Science

Content is designed to provide the basic concepts of patient care, including consideration for the physical and psychological needs of the patient and family. Routine patient care procedures will be described, as well as infection control procedures using standard precautions. Content also will include the study of factors that influence relationships with patients and professional peers.

Proposed minimum hours of instruction: 30

Principles of Computed Tomography (CT)

Content is designed to provide students with an exposure to principles related to computed tomography (CT) imaging.

Proposed minimum hours of instruction: 15

Radiation Biology

Content is designed to provide an overview of the principles of the interaction of radiation with living systems. Radiation effects on molecules, cells, tissues and the body as a whole are presented. Factors affecting biological response are presented, including acute and chronic effects of radiation.

Proposed minimum hours of instruction: 20

Radiation Protection

Content is designed to present an overview of the principles of radiation protection, including the responsibilities of the radiographer for patients, personnel and the public. Radiation health and safety requirements of federal and state regulatory agencies, accreditation agencies and health care organizations are incorporated.

Proposed minimum hours of instruction: 20

Radiographic Procedures of the Forensic Assistant

Content is designed to provide a knowledge base necessary to perform standard radiographic procedures. Consideration will be given to the production of images of optimal quality. Students will be introduced to clinical manifestations of pathologic processes, their radiographic appearance and relevance to radiographic procedures.

Proposed minimum hours of instruction: 15

ASRT

Resources

Textbooks

Adler A, Carlton R. *Introduction to Radiography and Patient Care*. 2nd ed. Philadelphia, PA: WB Saunders Company; 1999.
ISBN 0721676626

Applegate E. *The Sectional Anatomy Learning System*. 3rd ed. Philadelphia, PA: WB Saunders Company; 2010.
ISBN 9996048365

Applegate E. *The Anatomy and Physiology Learning System*. 2nd ed. Philadelphia, PA: WB Saunders Company; 2000.
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ARRT Examination in Computed Tomography. New York, NY: National Learning Corporation; 1997.
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Ball JE, Price T, eds. *Chesneys' Radiographic Imaging*. 6th ed. Cambridge, Mass: Blackwell Scientific Publishers Inc; 1995.
ISBN 0632039019

Bontrager K. *Pocket Atlas-Handbook of Radiographic Positioning and Techniques*. 4th ed. St. Louis, MO: Elsevier Mosby; 2002.
ISBN 0964172348

Bontrager K. *Radiographic Positioning and Related Anatomy*. 6th ed. St. Louis, MO: Elsevier Mosby; 2005.
ISBN 0323025072

Brennan P, Seeram E. *Digital Radiography*. Hoboken, NJ: Blackwell Publishing Professional; 2007
ISBN 0632064714

Brogdon BG. *Forensic Radiology*. Boca Raton, FL: CRC Press LLC; 1998.
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Brogdon BG, Vogel H, McDowell JD. *A Radiologic Atlas of Abuse, Torture, Terrorism, and Inflicted Trauma*. Boca Raton, FL: CRC Press LLC; 2003.
ISBN 0849315336

Bushberg JT, Seibert JA, Leidholt EM, Boone JM. *The Essential Physics of Medical Imaging*. 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2002.

ISBN 0683301187

Bushong S. *Computed Tomography*. New York, NY: McGraw-Hill; 2000.
ISBN 0071343547

Bushong S. *Radiologic Science for Technologists: Physics, Biology, and Protection*. 9th ed. St Louis, MO: Mosby; 2008.
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Bushong S, Williams EK. *Patient Care: Essentials of Medical Imaging Series*. New York: McGraw-Hill; 1998.
ISBN: 0070706328

Butler J, Lewis R, Shier D. *Hole's Human Anatomy & Physiology*. 12th ed. Boston, MA: McGraw-Hill Higher Education; 2009.
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Callaway W, Gurley LT. *Introduction to Radiologic Technology*. 6th ed. St Louis, MO: Mosby; 2002.
ISBN 0323035663

Campeau FE. *Radiography: Technology, Environment, Professionalism*. Philadelphia, PA: Lippincott Williams & Wilkins; 1999.
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Campeau F, Fleitz J. *Limited Radiography*. 3rd ed. Albany, NY: Delmar Publishers Inc; 1999.
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Carlton R, Adler A. *Principles of Radiographic Imaging: an Art and a Science*. 4th ed. Albany, NY: Delmar Publishers; 2006.
ISBN 1401871941

Carlton RR, Greathouse JS. *Delmar's Principles of Radiographic Positioning & Procedures Pocket Guide*. Albany, NY: Delmar Publishers; 2005.
ISBN 0766862461

Carroll Q. *Fuch's Radiographic Exposure, Processing, and Quality Control*. 7th ed. Springfield, IL: Charles C Thomas; 2003.
ISBN 0398073732

Chabner DE. *The Language of Medicine*. 8th ed. Philadelphia, PA: WB Saunders; 2004.
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Chiu LC, Lipcamon JD, Yiu-Chiu VS. *Clinical Computed Tomography for the Technologist*. 2nd ed. New York: Raven Press; 1995.
ISBN 0781702356

Code of Ethics. Albuquerque, NM: American Society of Radiologic Technologists; 1998.

Cornuelle AG, Gronefeld DH. *Radiographic Anatomy Positioning*. Stamford, CN: Appleton & Lange; 1998.
ISBN 0838582389

DeVos DC. *Basic Principles of Radiographic Exposure*. 2nd ed. Baltimore, MD: Williams & Wilkins; 1995.
ISBN 0683024582

Diestler S. *Becoming a Critical Thinker: A User Friendly Manual*. 4th ed. Upper Saddle River, NJ: Prentice Hall; 2005.
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Dowd SB, Wilson BG. *Encyclopedia of Radiographic Positioning*. Philadelphia, PA: WB Saunders; 1995.
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Dowsett DJ, Kenny PA, Johnston RE. *The Physics of Diagnostic Imaging*. New York: Chapman & Hall Medical; 2006.
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Durand KS. *Critical Thinking: Developing Skills in Radiography*. Philadelphia, PA: FA Davis Co; 1999.
ISBN 0803603436

Eisenberg RL, Dennis CA, May CR. *Radiographic Positioning*. 2nd ed. Boston, MA: Little, Brown and Company; 1995.
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Eisenberg RL, Johnson NM. *Comprehensive Radiographic Pathology*. 4th ed. St. Louis, MO: Mosby; 2007.
ISBN: 0323036244

Erlich R, McClosky E, Daly J. *Patient Care in Radiography: With an Introduction to Medical Imaging*. 7th ed. St. Louis, MO: Mosby; 2008.

ISBN: 0323051782

El-Khoury GY, Bergman RA, Montgomery W. *Sectional Anatomy by MRI/CT*. New York, NY: Churchill Livingstone Inc; 1990.

ISBN 0443085439

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