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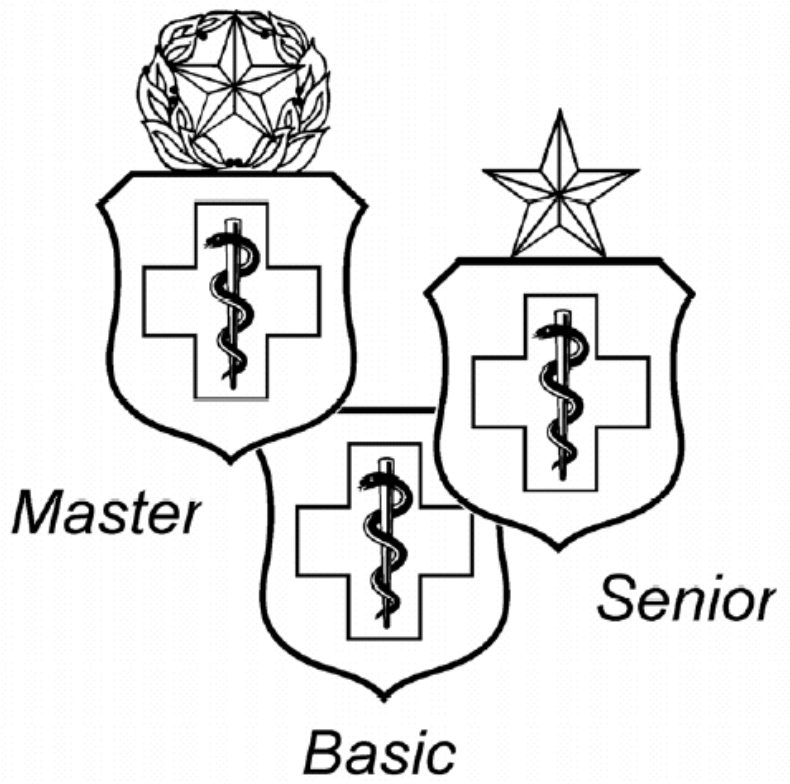
CFETP 4R0X1/A/B/C
Parts I and II
18 March 2024

AFSC 4R0X1 Diagnostic Imaging
With subspecialties 4R0X1A Nuclear Medicine, 4R0X1B Diagnostic Medical Sonography, and 4R0X1C Magnetic Resonance Imaging (MRI)



CAREER FIELD EDUCATION AND TRAINING PLAN

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Part I

Preface

1. This Career Field Education and Training Plan (CFETP) is a comprehensive education and training document that identifies life-cycle education and training requirements, training support resources, and minimum core task requirements for this specialty. The CFETP will provide personnel a clear career path to success and will instill rigor in all aspects of career field training. The CFETP format is standardized in accordance with DAFMAN 36-2689, *Training Program*. NOTE: Civilians occupying associated positions will use Part II to support duty position qualification training.

2. The CFETP consists of two parts. Supervisors plan, manage, and control training within the specialty using both parts of the plan.

2.1. Part I provides information necessary for overall management of the specialty.

2.1.1. Section A-General information explains how everyone will use the plan.

2.1.2. Section B-Career Field Progression identifies career field progression information, duties and responsibilities, training strategies, and career field path.

2.1.3. Section C-Skill Level Training Requirements associates each level with specialty qualifications (knowledge, education, experience, training, and other).

2.1.4. Section D-Resource Constraints indicates resource constraints. Some examples are funds, manpower, equipment, and/or facilities.

2.1.5. Section E-Transitional Training Guide identifies transition training guide requirements.

2.2. Part II is used by supervisors and trainers at the unit level to identify, plan, and conduct training commensurate with the overall goals of this plan.

2.2.1 Section A-Specialty Training Standards. Identifies the Specialty Training Standard (STS) with tasks and training references. Air Education and Training Command (AETC) conducted training, wartime course and core task and correspondence course requirements.

2.2.2. Section B-Course Objective List contains the course objective list and training standards which supervisors will use to determine if Airmen satisfied training requirements.

2.2.3. Section C-Support Materials identifies available support materials that have been developed and are mandatory for use to support On-the-Job Training.

2.2.4. Section D-Training Course Index contains a training course index supervisors can use to determine resources available to support training. Both mandatory and optional courses are included.

2.2.5. Section E-Major Command Unique Requirements identifies major command (MAJCOM) unique training requirements supervisors can use to determine additional training required for the associated qualification needs. At unit level, supervisors and trainers will use Part II to identify, plan, and conduct training commensurate with the overall goals of this plan.

2.2.6. Section F is specific to medical Air Force Specialty Codes (AFSC) and provides guidance on required documentation in the enlisted training and competency folder. At the unit level, supervisors and trainers use Part II to identify, plan, and conduct training commensurate with the overall goals of this plan.

3. Using guidance provided in the CFETP will ensure individuals in this specialty receive effective and efficient training at the appropriate points in their career. This plan will enable us to train today's work force for tomorrow's jobs.

Abbreviations/Terms Explained

Advanced Training (AT). A formal course providing individuals who are qualified in one or more positions of their Air Force Specialty (AFS) with additional skills/knowledge to enhance their expertise in the career field. Training is for selected career airmen at the advanced level of the AFS.

Air Education and Training Command (AETC). Conducts basic training for all Air Force enlisted personnel, produces skilled flying and ground personnel, and trains many of the world's military forces. Along with basic military, technical, and flying training, AETC provides other types of training, such as aircrew transitional, special, advanced, lateral, and survival training.

Air Force Career Field Manager (AFCFM). The AFCFM is the Air Force (AF) focal point for the designated career field within a functional community. Serves as the primary advocate for the career field, addressing issues and coordinating functional concerns across various staffs. Responsible for the career field's policy and guidance.

Air Force Specialty (AFS). A group of positions (with the same title and code) that require common qualifications.

Air Force Career Development Academy (AFCDA). Provides instructional opportunities for customers beyond the confines of the formal classroom. AFCDA has an enrollment, distribution, tracking, and testing system in place for distance learning courses.

Air Force Job Qualification Standard/Command Job Qualification Standard (AFJQS/CJQS). A comprehensive task list describing a particular job type or duty position. Supervisors use these to document task qualifications. The tasks on AFJQS/CJQS are common to all persons serving in the described duty position.

As Low As Reasonably Achievable (ALARA). Describes a management philosophy of taking action to keep radiation exposure of patients and health care workers at the lowest practical level consistent with current technology.

Associate Career Field Managers (ACFMs). As Diagnostic Imaging is a diverse career field with modalities that require extensive training, many responsibilities are delegated to modality Functional Managers, or ACFMs for each modality. The modalities with ACFMs include Computed Tomography, Magnetic Resonance Imaging, Mammography, Nuclear Medicine, Picture Archive and Communication System (PACS), Interventional Radiography, and Diagnostic Medical Sonography.

American Registry for Diagnostic Medical Sonography (ARDMS). A nationally recognized certification body for diagnostic medical sonographers. Certified professionals may use the title "Registered Diagnostic Medical Sonographer" and its abbreviation "RDMS". RDMS specialty areas pertinent to this AFSC include abdomen, obstetrics and gynecology, vascular, and breast.

Other associated titles include “Vascular Technologist” and its abbreviation “RVT”. Noninvasive vascular technology is a specialty area in RVT.

American Registry of Radiologic Technologists (ARRT). A nationally recognized certification body for many radiologic science professionals. Certified professionals may use the title “Registered Technologist” and its abbreviation “R.T.” after their name, along with the initial designating their certification specialty or subspecialty. Specialty certifications are offered for radiographers (R), nuclear medicine technologists (N), and radiation therapists (T). Subspecialty certifications are also offered in mammography (M), computed tomography (CT), magnetic resonance imaging (MR), cardiovascular-interventional technology (CV), bone densitometry (BM), sonography (S), vascular sonography (VS), breast sonography, and quality management (QM). SEI code 488 is reserved for those achieving this distinction.

American Society of Radiologic Technologists (ASRT). A national professional organization for radiologic science professionals. Through its legislative body, the House of Delegates and its appointees to the educational accreditation and professional certification bodies, the ASRT sets policy and direction for the profession. A military chapter was established in 1995, giving military radiologic science professionals a voice in the organization through the military delegates in the House of Delegates.

Career Field Education and Training Plan (CFETP). A CFETP is a comprehensive, multipurpose document encapsulating the entire spectrum of education and training for a career field. It outlines a logical growth plan including training resources and is designed to make career field training identifiable, eliminate duplication, and ensure this training is budget defensible.

Certification. A formal indication of an individual’s ability to perform a task to required standards.

Certifying Official. A person whom the commander assigns to determine an individual’s ability to perform a task to required standards.

Comprehensive Medical Readiness Program (CMRP). Formerly Readiness Skills Verification (RSV). It’s a program designed to maintain war skill core competencies for all radiologic technologists. The CMRP program is outlined in AFI 46-106, *Air Force Medical Readiness Program*, chapter 4. **Note:** Refer website for readiness skills requirements.

Core Task. A task AFCFMs identifies as minimum qualification requirements within an Air Force Specialty Code (AFSC), regardless of duty position.

Course Objective List. A publication, derived from initial/advanced skills course training standard, identifying the tasks and knowledge requirements, and respective standards provided to achieve a 3-5-7-skill level in this career field. Supervisors use the course objective list to assist in conducting graduate evaluations in accordance with DAFI 36- 2670, Total Force Development.

Digital Imaging and Communications in Medicine (DICOM). Standard for handling, storing, printing, and transmitting information in medical imaging.

Developmental Special Duty (DSD). A nominative process by which Airmen are selected to fill key developmental positions in the Air Force. Positions include Military Training Instructor, Military Training Leader, AF Honor Guard, Airmen Development Advisor, Airman and Family Readiness Coordinator, PME Instructor, Academy Military Trainer, and Recruiter.

Educational Development Team (EDT). Team of 4R career field leaders that evaluate personnel records for deliberate development opportunities, and key leadership roles in Diagnostic Imaging. These positions include (but are not limited to): MAJCOM Functional Managers, ACFMs, METC Service Lead, and Educational Leadership roles in Diagnostic Imaging.

Electronic Health Record (EHR). Integrated health system for capturing, managing and storing electronic health information for beneficiaries served. For the purposes of this document this includes the legacy CHCS system, and MHS Genesis systems.

Functional Manager (FM). Senior leaders, designated by the appropriate functional authority who provide day-to- day management responsibility over specific functional communities at the MAJCOM, field operating agencies (FOA), direct reporting unit (DRU), or ARC level. While they should maintain an institutional focus in regard to resource development and distribution, FMs are responsible for ensuring their specialties are equipped, developed, and sustained to meet the functional community's mission as well as encourage force development opportunities to meet future needs of the total Air Force mission.

High Reliability Organization (HRO). Along with providing trusted care, an HRO is an organization following the AFMS vision of being a continuously learning and improving organization with a single-minded focus of safety and achieving zero harm to patients and medical staff.

Hospital Information Systems (HIS). Comprehensive, integrated information system designed to manage all aspects of hospital operation.

Imaging Informatics. Concerns how medical images are used and exchanged throughout complex health care systems.

Initial Skills Training. A formal resident course resulting in award of the entry level apprenticeship.

Instructional System Development (ISD). A deliberate and orderly, but flexible process for planning, developing, implementing, and managing instructional systems. It ensures personnel are taught in a cost-efficient way with the knowledge, skills, and attitudes essential for successful job performance. The Air Force ISD model graphically illustrates the process. Evaluation is the foundation of this process. ISD is a continuous process with the flexibility to enter and re-enter various phases as needed to develop, update, or revise instruction. All ISD activities take place within and are dependent upon system functions. Teamwork is required between personnel performing system functions and those designing, developing, and implementing instructional systems. All ISD activities and system functions focus on continuous quality improvements in the system.

Joint Review Committee (JRC). Educational review committees formed of representatives from a medical profession (including the radiologic science profession) that publish standards for and render accreditation decisions on educational programs in the radiologic sciences. *The Joint Review Committee on Education in Radiologic Technology (JRCERT) and the* COE (Council on Occupational Education) accredits the 4R0X1 educational program.

Major Command (MAJCOM) Functional Manager (FM). A person appointed as the senior representative for an AFS within a specific MAJCOM. Among other responsibilities, MAJCOM FMs work with the AFCFM to develop, implement, and maintain the CFETP.

Master Task List (MTL). A comprehensive list (100%) of all tasks performed within a work center and consisting of the current CFETP or Air Force Job Qualification Standard (AFJQS) and locally developed DAF Form 797, (as a minimum). Should include tasks required for deployment and/or Unit Type Code (UTC) requirements.

Master Training Plan (MTP). Employs a strategy for ensuring the completion of all work center job requirements by using a MTL. It provides milestones for tasks, CDC completion, and prioritizes deployment/UTC, home station training tasks, upgrade, and qualification tasks.

Nuclear Medicine Technology Certification Board (NMTCB). A nationally-recognized certification body sponsored by the Society of Nuclear Medicine (SNM). Certified nuclear medicine technologists may use the title "Certified Nuclear Medicine Technologist" and its abbreviation "CNMT" after their name. Sub-specialty certifications are also offered in Computed Tomography (CT), Nuclear Cardiology Technologist (NCT), and Positron Emission Tomography (PET).

Occupational Analysis Report (OAR). A detailed report showing the results of an occupational survey of tasks performed within a particular AFS.

On-the-Job Training (OJT). Hands-on, over-the-shoulder training conducted to certify personnel in both upgrade (skill level award) and job qualification (duty position certification) training.

Phase II Training. Clinical and didactic training that is a continuation of a formal resident course that provides Airmen with realistic hands-on experience before beginning OJT at the permanent duty location.

Picture Archiving and Communication System (PACS). PACS is a network medical system consisting of the acquisition, display and storage of diagnostic images. The PACS supports diagnostic imaging and other departments capable of producing and transmitting DICOM objects. The PACS has the capability to transmit studies throughout the hospital, and AFMS via the AF and DHA network.

Preceptor. Qualified individuals to conduct performance and didactic training. Refer to Medical Training Guide (MTG)

Qualification Training (QT). Actual hands-on task performance training designed to qualify an individual in a specific duty position. This portion of the dual channel OJT training program occurs both during and after the upgrade training process. It is designed to provide the performance skills required to do the job.

Qualification Training Package (QTP). An instructional package designed for use at the unit to qualify, or aid qualification, in a duty position or program, or on a piece of equipment. It may be printed, computer-based, or in other audiovisual media. QTPs establish performance standards and are designed to standardize skill verification and validation of task competency.

Radiology Information Systems (RIS). Networked software suite for managing medical imagery and associated data.

Resource Constraints. Resource deficiencies, such as money, facilities, time, manpower, and equipment precluding desired training from being delivered.

Specialty Training Requirements Team (STRT). A forum of MAJCOM AFS functional managers, subject matter experts, and AETC training personnel that determines career ladder training requirements. This occurs prior to, or in conjunction with the U&TW. DAFMAN 36-2689 defines the primary purpose of the STRT: "is for the AFCFM and functional leaders to determine and present training requirements to the AETC Training Pipeline Manager (TPM) and Training Manager TM.

Specialty Training Standard (STS). An Air Force publication describing skills and knowledge airmen in a particular AFS need on the job. It further serves as a contract between the Air Education and Training Command and the user to show the overall training requirements for an AFSC the formal schools teach.

Standard. An exact value, a physical entity, or an abstract concept, established and defined by authority, custom, or common consent to serve as a reference, model, or rule in measuring quantities or qualities, establishing practices or procedures, or evaluating results, a fixed quantity or quality.

Supplemental Training. Training toward a portion of an AFS without change by AFSC. Formal training on new equipment, methods and technology that are not suited for on-the-job training.

Technical Reference (TR). Teaching material used in the design and development of lesson plans, curriculum, and objectives in support of STS items.

Total Force. All collective Air Force components (active, reserve, guard, and civilian elements) of the United States Air Force.

Training Capacity. The capability of a training setting to provide training on specified requirements, based on the availability of resources.

Trainer. A trained and qualified person approved by the commander to teach personnel to perform specific tasks through on-the-job methods.

Training Requirements Analysis. A detailed analysis of tasks for a particular AFS to be included in the training decision process.

Upgrade Training (UGT). Mandatory training leading to attainment of a higher level of job proficiency.

Utilization and Training Workshop (U&TW). A forum of AFSC MAJCOM Functional Managers (MFMs), subject matter experts (SMEs), and AETC training personnel who determine the career ladder training requirements.

Wartime Course. Any course (for officers or enlisted) designed by higher headquarters to be conducted during wartime. Wartime courses are categorized as: 1) courses directed to continue training at the existing student flow to satisfy the training personnel requirement; or 2) courses directed to expand student flow above the training personnel requirement to satisfy wartime training requirements.

Section A – General Information

Purpose of this CFETP

1. Purpose of the CFETP. This CFETP provides the information necessary for AFCFMs, MFMs, commanders, training managers, supervisors, trainers and the applicable AETC training

wing to plan, develop, manage, and conduct an effective and efficient career field training program. This plan outlines training individuals must receive to develop and progress throughout their career. It also identifies initial skills, upgrade, qualification, advanced proficiency, sustainment, and continuing education and training. Initial skills training is the AFS specific training an individual receives upon entry into the Air Force or upon retraining into a specialty. For our career field, this training is provided by AETC, 382d Training Squadron (TRS) at Ft Sam Houston, TX. This is followed by a Phase II program at one of multiple bases across the Department of Defense. Trainee throughput is managed by AETC in conjunction with, and IAW a working agreement with METC. Upon successful completion of the training, individuals are awarded their 3-skill level AFSC.

1.1. Upgrade training identifies the mandatory courses, task qualification requirements, and correspondence course completion requirements for award of the 5 and 7-skill levels. QT is actual hands-on task performance training designed to qualify an Airman in a specific duty position. This training program occurs both during and after the UGT process. It is designed to provide the performance skills and knowledge required to do the job. Advanced training is formal AFS training used for selected airmen. Proficiency training is additional training, either in-residence, exportable advanced training courses, or OJT, provided to personnel to increase their skills and knowledge beyond the minimum required for upgrade.

Use of the CFETP

1.2. The CFETP also serves the following purposes:

1.2.1. Identifies task and knowledge training requirements for each skill level in the specialty and recommends education/training throughout each phase of an individual's career.

1.2.2. Lists training courses available in the specialty, identifies sources of training, and the training delivery method.

1.2.3. Identifies major resource constraints which may impact full implementation of the career field training process.

1.2.4. Identifies the training elements required for the comprehensive medical readiness program (CMRP) to ensure individuals are fully trained to meet contingency missions.

2. Uses of the CFETP. This plan will be used by MFMs and supervisors at all levels to ensure comprehensive and cohesive training programs are available for everyone in the specialty.

2.1. AETC training personnel will develop or revise formal resident, nonresident, field, and exportable training based upon requirements established by the users and documented in Part II of the CFETP. They will also work with the AFCFM to develop acquisition strategies for obtaining resources needed to provide the identified training.

2.2. MFMs will ensure their training programs complement the CFETP mandatory initial, upgrade, and proficiency requirements. OJT, resident training, and contract training or exportable courses can satisfy identified requirements. MAJCOM-developed training to support this AFSC must be identified for inclusion into the plan.

2.3. Each member will complete the mandatory training requirements specified in this plan. The list of courses in Part II will be used as a reference to support training.

Coordination and approval of the CFETP

3. Coordination and Approval. The AFCFM is the approval authority. Also, the AFCFM will initiate an annual review of this document to ensure currency and accuracy. MAJCOM representatives and AETC training personnel will identify and coordinate on the career field training requirements. Using the list of courses in Part II, they will eliminate duplicate training.

4. Waiving Specialty Qualification Requirements. Qualification requirements for this specialty are published in the Air Force Enlisted Classification Directory (AFECD) and this CEFTP. These requirements may be for entry, award or retention of this specialty and respective skill levels. Unique circumstances may warrant waiving certain requisites. Consideration for a waiver should not become the normal practice. However, a waiver can save training resources without affecting career field progression or mission accomplishment when an individual possesses qualifications equivalent to the established requirements.

4.1. Evaluating waiver requests. Supervisors, managers, and leaders must compare each waiver request individually and against predetermined standards in order to maintain integrity of the career field. Scrutinize the member's task knowledge, performance, ability to learn and transfer knowledge to performance, and future within the specialty in relation to peers. Waiver requests must consider the following factors:

4.1.1. Education. Has the member previously completed an equivalent education or certification program (or equivalency test)? Has the member performed duty in an exceptional manner over an extended period of time in the actual or equivalent AFS or civilian occupation?

4.1.2. Training. Has the member completed an equivalent technical training course or civilian vocational training course, certification program (or equivalent test)?

4.1.3. Knowledge. Does the member possess the career knowledge equivalent to current requirements?

4.1.4. Experience. Supporting documentation must include proof of experience, such as performance reports, training records, state or federal operating licenses, certificates of affiliation, etc.

4.1.5. Other. Does the member possess the physical ability, aptitude, or qualifications that are equivalent to, or commensurate with, the established requirement?

4.2. Responsibilities.

4.2.1. Individual. Does the member acknowledge possessing the prescribed training requirements? Trainees must understand their education and training requirements, accept responsibility for training, and document task qualification.

4.2.2. Supervisor. Did the commander and supervisor fulfill their obligations to the trainee and the training program? Level of support or involvement is not, by itself, justification for approving waivers – it may indicate problems in training equity or other areas.

4.2.3. Training system equity. This area relates to circumstances beyond a trainee's control such as the following: Were training or testing conditions abnormal? Did the training or testing system provide the best opportunity for successful completion of training requirements? Was the training or testing system flexible enough to allow for unexpected situations or conditions? Did those responsible for the training or testing program fulfill their obligations effectively?

Depending on the facts, this area may warrant options other than approving a waiver.

4.3. Processing waiver requests. Process waiver requests according to DAFMAN 36-2689

5. Electronic Training Record (myTraining). The OJT and Upgrade Training Management database. This is the Total Force Training Record (TFTR) and replaces the legacy system AFTR.

5.1. Documentation. Use the automated electronic training record (myTraining) to document all technician qualifications. NOTE: An AFJQS may be used in lieu of Part II of the CFETP only upon approval of the AFCFM. The AFCFM may supplement these minimum documentation procedures as needed or deemed necessary for the career field.

5.2. Transcribing a new or revised CFETP. The AFCFM will provide transcription instructions in order for the record to be transcribed within electronic training record (myTraining). This process will be seamless to the field user as all existing trainee records will be auto transcribed.

5.3. Decertification and recertification. When an Airman is found to be unqualified on a task previously certified for his/her position, the supervisor deletes the previous documented certification. Appropriate remarks are entered on the AF Form 623A, On-the-Job Training Record Continuation Sheet, identifying the reason for decertification. Upon subsequent recertification, document for any other training qualification.

Section B – Career Field Progression

Specialty Description

1. Specialty Summary. Operates equipment to produce diagnostic images and assists radiologist or physician with special procedures. Prepares equipment and patients for diagnostic studies and therapeutic procedures. Performs technical and administrative imaging activities. Ensures health protective measures such as standard and transmission-based precautions and radiation protection are established and employed. Assists the radiation oncologist. Manages diagnostic imaging functions and activities. Related DoD Occupational Subgroup: 131300.

2. Duties and Responsibilities:

2.1. Operates fixed and portable radiographic equipment to produce routine diagnostic medical images. Computes techniques and adjusts control panel settings such as kilovoltage, milliamperage, exposure time, and focal spot size. Positions patient to image desired anatomic structures. Selects image recording media, adjusts table or image receptor (cassette holder), aligns x-ray tube for correct distance and angle, and restricts radiation beam for maximum patient protection. Exposes and processes images.

2.2. Uses specialized equipment to perform nuclear medicine, mammography, diagnostic medical sonography, computed tomography, and magnetic resonance imaging (MRI), picture archive and communications system (PACS), and interventional radiography (IR). Selects imaging protocols and required accessories and makes adjustments based on the specific examination requirements. Records and processes the image. Manipulates the recorded image using computer applications.

2.3. Assists physicians with fluoroscopic, interventional, and special examinations. Instructs patients preparing for procedures. Prepares and assists with contrast media administration. Maintains emergency response cart. Assists physician in treating reactions to contrast material.

Prepares sterile supplies and equipment. Operates accessory equipment such as automatic pressure injectors, and digital imagers, stereotactic biopsy devices, and vital signs monitoring equipment. Performs image subtraction and manipulation techniques.

2.4. Performs and supervises general diagnostic imaging activities. Cleans and inspects equipment and performs preventive maintenance. Receives patients, schedules appointments, prepares and processes examination requests and related records, and processes images and reports. Enters and maintains data in the PACS, radiology information system (RIS), and hospital information system (HIS). Assists with phase II clinical training, evaluation and counseling of students, and maintenance of student academic records. Participates in formal research projects.

2.5. Establishes and maintains standards, guidelines, and practices. Composes protocols. Prepares routine positioning guides and technique charts. Reviews images to ensure quality standards are met. Performs equipment quality control checks. Monitors personnel to ensure protective procedures such as those in the As Low As Reasonably Achievable (ALARA) radiation safety, hazardous material communications, and Air Force occupational safety and health programs are followed. Performs tests on radiation protection equipment. Assesses staff competence and monitors appropriateness of care and completeness of examination requests.

2.6. Plans, organizes, and supervises diagnostic imaging activities. Analyzes workload and establishes production controls and performance standards for administrative and technical activities. Coordinates on interdepartmental issues that interface with diagnostic imaging. Prepares and implements financial plan and monitors and analyzes annual expenditures. Prepares equipment purchase requests and justifications. Monitors equipment performance and preventive maintenance activities. Recommends new equipment procurement. Performs as the diagnostic imaging facility manager.

3. Specialty Qualifications:

3.1. Knowledge. The following knowledge is mandatory for award of the AFSC indicated*:*

3.1.1. 4R0X1. Human anatomy and physiology; medical terminology and ethics; legal aspects of medicine; healthcare accreditation standards; radiation physics, biology, and protection; basic electronics theory; techniques of operating x-ray and specialized diagnostic imaging equipment; radiographic positioning; patient care and monitoring techniques; image recording media and processing techniques; quality control procedures; aseptic and sterile techniques; reactions to contrast media; cardiopulmonary resuscitation; methods of recording the fluoroscopic image; patient and equipment safety; budget preparation and execution; and medical records administration. Upon learning these items, members will challenge the national certification board.

3.1.2. 4R0X1A. Algebra, nuclear physics, clinical chemistry, nuclear pharmacology, and Nuclear Regulatory Commission regulations concerning use of radionuclides.

3.1.3. 4R0X1B. Ultrasound physics; techniques of operating specialized ultrasound components and equipment; basic knowledge of vascular and abdominal anatomy (topical and cross-sectional), including normal variant anatomy, abnormal anatomy, and obstetric anatomy; and abnormal anatomy transducer characteristics, differences, and use.

3.1.4. 4R0X1C. Magnetic physics, magnetism, magnetic safety, and radio frequency; techniques of operating MRI equipment; and advanced knowledge of cross-sectional anatomy applicable to MRI.

3.2. Education. For entry into this specialty, completion of high school or general education development equivalency with successful completion of courses in algebra, and biology or general science are mandatory. The following college course are required: English Composition I (3 credits) and Speech (3 credits). AP exam English Composition (minimum score of 3) is accepted in place of English Composition I. Successful completion of high school or collegiate courses in chemistry and physics is desirable.

3.3. Training. The following training is mandatory for award of the AFSC indicated:

3.3.1. 4R031. Completion of Diagnostic Imaging Phase I and Phase II courses.

3.3.2. 4R031A. Completion of the Nuclear Medicine Phase I and Phase II courses.

3.3.3. 4R031B. Completion of a Diagnostic Medical Sonography Phase I and Phase II Courses.

3.3.4. 4R031C. Completion of Magnetic Resonance Imaging Course.

3.3.5. Wartime Course Operations: In the event that it is determined that an accelerated course is required to meet wartime demands, students will be placed directly into a phase II site upon completion of BMT. This accelerated program will consist of 5 months of hands-on training that will be targeted at the forty-one 3-level tasks required to perform basic radiologic examinations. Additionally, training pipelines for Nuclear Medicine and MRI will be placed on strategic pause until future demands are determined.

3.4. Experience. The following experience is mandatory for award of the AFSC indicated:

3.4.1. 4R051. Qualification in and possession of AFSC 4R031. Also, experience operating x-ray equipment, and producing and processing radiographs.

3.4.2. 4R051A/B/C. Prior qualification in and possession of AFSC 4R031A/B/C respectively. Also, experience performing applicable shred (nuclear medicine, diagnostic medical sonography, or MRI) functions and activities.

3.4.3. 4R071. Prior qualification in and possession of AFSC 4R051. Also, experience performing or supervising functions such as producing radiographs, assisting with fluoroscopy and special radiographic procedures.

3.4.4. 4R071A/B/C. Prior qualification in and possession of AFSC 4R051A/B/C respectively. Also, experience performing or supervising nuclear medicine, diagnostic medical sonography, or MRI functions and activities.

3.4.5. 4R090. Prior qualification in and possession of AFSC 4R071, 4R071A, 4R071B, or 4R071C. Also, experience managing radiologic, nuclear medicine, ultrasound, or MRI functions and activities; mandatory experience of medical service organization and function, medical administrative procedures, medical supply procedures, medical equipment management procedures, personnel management and administration. Adherence to Nuclear Regulatory Commission regulations governing medical use of radioisotopes, Mammography Quality Standards Act (MQSA) and Food & Drug Administration (FDA) inspections, applicable environmental protection standards, preparation for execution of budgets, management of non-military personnel, and applicable accreditation standards and inspection procedures.

3.5. Other. The following qualifications are mandatory as indicated:

3.5.1. For entry into this specialty:

3.5.1.1. A minimum age of 18 years prior to entry into technical training.

3.5.1.2. See attachment 4 of the Air Force Enlisted Classification Directory (AFECD) for additional entry requirements.

3.5.2. For entry into 4R0X1A/B or C, prior qualification in and possession of AFSC 4R051/71.

3.5.2.1. Reassigning back to slick 4R0X1 AFSC. Members assigned to the 4R0X1A/B/C modalities are eligible to pursue transitioning back to the slick 4R0X1 AFSC following five years of service in their selected modality.

3.5.2.2. Members may start this process at the 54-month mark by discussing their intentions with their respective Associate Career Field Manager (ACFM) and their MAJCOM Functional Manager (MFM).

3.5.2.3. Each request will be addressed on a case-by-case basis as there are several factors that will be considered prior to members being reassigned back to the slick 4R0X1 AFSC.

3.5.2.4. Members serving in overseas locations will be required to work with their respective ACFM and MFMs at least two assignment cycles prior to their DEROS to ensure they are not given an assignment based off shred.

3.5.2.5. If member elects to extend their DEROS or has an approved IPCOT (In Place Consecutive Overseas Tour), they must fulfill their current shred in that overseas location.

3.5.2.6. All appeals for member's desiring to be reassigned back to the slick 4R0X1 AFSC will be made with the advisement and consent of the Career Field Manager.

3.5.3. Applicants retraining into the 4R0X1 career field must have less than 14 years TIS and be ability to garner 36 months retainability upon graduation of the Phase II program.

Section C – Skill Level Training Requirements

1. Skill and Career Progression. Adequate training and timely progression from the apprentice to the superintendent level play an important role in the Air Force's ability to accomplish its mission. It is essential that everyone involved in training does his or her part to plan, manage, and conduct an effective training program. The guidance provided in this part of the CFETP will ensure everyone receives viable training at appropriate points in their career.

1.1. Apprentice (3-level). Initial skills training in this specialty consists of the task and knowledge training provided in Phase I and Phase II. The decision to train specific task and knowledge items is based on JRCERT accreditation requirements, review of OAR data, and 4R0X1(A/B/C) subject matter expert input. Member will demonstrate high aptitude and proficiency by attaining registry board preparation scores IAW METC quality control standards. Near the end of Phase II, students who pass the course will be conferred an Associate of Science in Health Sciences (ASHS) in Radiologic Technology. To maintain good standing with civilian accreditation, students will challenge the radiology technologist national certification examination at least once while still in phase II. This condition is only waiverable by the AFCFM. After completing initial skills training, apprentices will work with qualified diagnostic imaging journeymen, craftsmen, and radiologists to further enhance their knowledge and skills. Job assignments will normally include duties in diagnostic imaging service administration, routine clinical radiography, and/or assisting in special clinical radiography. The apprentice should devote their full time learning the medical field and their primary job.

1.2. Journeyman (5-level). Following completion of the prerequisites for upgrade to the 5-skill level, new journeymen should consider expanding their personal and professional horizons as they enter into continuation training. Job assignment possibilities widen to include more

emphasis in special clinical radiography areas, duties as a preceptor/clinical instructor for Phase II students, duties in diagnostic imaging logistics, and first line supervisory duties in routine clinical radiography or diagnostic imaging service administration areas. Completion of continuing education requirements are mandatory for maintaining current ARRT certification. At this level individuals are highly encouraged to consider training into one of the SEIs, AFSC shred areas, or special duties. Individuals interested in becoming 4R instructors must have or be able to complete requirements for an associate degree within 1 year following assignment to instructor duty. Additionally, all instructors must hold and maintain a national certification within their specialty. PACS administrators may be selected from this group. Active involvement in squadron and community activities is strongly encouraged. Individuals will begin preparation for promotion to Staff Sergeant under the Weighted Airman Promotion System (WAPS). Individuals will attend Airman Leadership School (ALS) upon selection for promotion to Staff Sergeant. Individuals who retrain into the 4R0X1 specialty should not be assigned management responsibilities until they have obtained the 5-skill level, regardless of rank.

1.3. Craftsman (7-level). Upon selection for promotion to the grade of Staff Sergeant, journeymen may be entered into upgrade training for the 7-skill level (no earlier than the first day of the promotion cycle). Individuals must have been awarded the 5-skill level and be certified in all 5-level tasks within the capability of their institution. Craftsmen are expected to be knowledgeable and highly skilled in a wide variety of duties within the AFS. They may serve in supervisory, administrative, or management positions in the basic AFS areas, or in technical or supervisory positions in one of the subspecialty areas. PACS administrators, Phase II course supervisors, the career field technical writer, ACFMs for the modalities, instructors and instructor supervisors at the technical training school are normally selected from this group of widely experienced technologists. By now, individuals should have completed the CAHS/CCAF degree. Individuals are encouraged to continue college education toward a baccalaureate or advanced degree in a specialty directly related to the AFSC (radiologic technology or health sciences), or one that would prepare the individual for the higher-level management positions in the AFSC (business administration, personnel management, or education). Active involvement in squadron, base, and community activities to help build leadership and management abilities is strongly encouraged.

1.4. Superintendent (9-level). Superintendents are normally assigned to top level supervisory positions at the regional hospital or medical center level. College courses in the areas of financial and personnel management should be included in the education program as the individual completes a baccalaureate or advanced degree. Active involvement should continue in squadron, base, and community activities and in all levels of the career field's professional organizations with emphasis placed on assuming leadership roles. The Senior Noncommissioned Officer Academy (SNCOA) is required for all persons selected for promotion to Senior Master Sergeant.

1.5. Proficiency Training. Nuclear Medicine and DMS upgrade to 3-skill level incorporates a Phase I and Phase II concept similar to the Radiology program. Completion of the in-resident MRI course will award the 3-skill level. The 5-skill level upgrade requirements will be accomplished via OJT.

1.6. Duty Titles. Appropriate duty titles for personnel working in this specialty depends on level of performance, and area of responsibility. *Approved Duty titles* - Radiologic Technologist,

Computed Tomography Technologist, Diagnostic Medical Sonographer, Nuclear Medicine Technologist, MRI Technologist, Mammography Technologist, PACS Administrator, NCOIC for each element in Flight, Flight Chief, Section Chief, Course Supervisor, Diagnostic Imaging Superintendent, and student.

1.6.1. Radiologic Technologists duties. Operates fixed and portable radiographic equipment to produce routine diagnostic medical images. Computes technical factors and adjusts control panel settings such as kilovoltage, milliamperage, exposure time, and focal spot size. Positions patient to image desired anatomic structures. Selects image recording media, adjusts table or image receptor (cassette holder), aligns x-ray tube for correct distance and angle, and restricts radiation beam for maximum patient protection. Exposes and processes images. Utilizes PACS and EHR to manipulate, transmit, and store diagnostic images. Performs administrative duties (digital image library functions, scheduling, report disposition, additional duties) as appropriate. Assists physicians with fluoroscopic, interventional, and special examinations. Instructs patients preparing for procedures. Prepares and assists with contrast media administration. Maintains emergency response cart. Assists physician in treating reactions to contrast material. Prepares sterile supplies and equipment. Operates accessory equipment such as automatic pressure injectors, and digital imagers, stereotactic biopsy devices, and vital signs monitoring equipment. Ensures only optimal examinations are presented to the radiologist for interpretation. Precepts/trains students and staff in the performance of providing diagnostic X-rays and quality care. Maintains and calibrates equipment.

1.6.2. Computed Tomography (CT) Technologist. Operates CT equipment to produce diagnostic medical images. Technologists prioritize patient throughput based on needs and determine patient preparation by coordinating care for routine, emergent, inpatient, and special needs patients with the appropriate clinical staff. Technologists perform consent procedures before CT exams requiring documented consent from patients. Technologists select and set technical factors, adjust accessory equipment, and make CT exposures necessary for the requested procedure(s) for pediatric, adult, and geriatric patients. Technologists determine proper instrument technical factors and control settings to ensure correct calculated exposure of targeted body parts and assure that sterile supplies, contrast materials, catheters, or other required materials are available and in place. Technologists prepare and administer contrast media orally, by enema, or intravenously under the close supervision of a radiologist. They operate contrast power injectors, screen patients for contraindications to contrast use, inform radiologists of conflicts before injection, and respond promptly to adverse contrast reactions if/when necessary. Technologists independently perform routine and emergent CT procedures imaging the head, neck, chest, abdomen, pelvis, spine, extremities, biopsy, CT angiography, multiphasic, and other ancillary procedures. Technologist build/perform CT protocols, adjust imaging parameters to include window level/window widths, display field of view, obtain part measurements, region of interest, and reconstructs/reformat images. Technologists digitally reconstruct acquired images per standard protocols and perform 3D reconstructions as requested per physician requests and radiologist needs. As required by the procedure or the patient's condition technologist will monitor vital signs such as blood pressure/heart rate and notify radiologist of significant changes. They ensure only optimal examinations are presented to a radiologist for interpretation and maintain records of patients examined, studies performed, sequences taken, and technical factors used. Technologists routinely perform digital image library functions by acquiring, reformatting, transmission, storage, and loan procedures. Technologists precept/train students and staff in diagnostic CT and quality care. Lastly, technologists maintain and calibrate CT equipment in

accordance with manufacturing standards.

1.6.3. Nuclear Medicine Technologist. All operations are IAW NRC. Operates Nuclear Medicine equipment to produce diagnostic medical images. Subjects patients to radiation, minimizing the radiation exposure to workers and patients. Prepares and administers prescribed radiopharmaceuticals to detect, diagnose, and treat a variety of diseases under direction of a physician. Administers radiopharmaceuticals through injection, inhalation, or ingestions. Adds radioactive substances to biological specimens. Administers medications for diagnostic imaging and other procedures. Gathers information on patients' illnesses and medical history to guide the choice of diagnostic procedures for therapy. Executes blood volume, red cell survival, and fat absorption studies following standard laboratory techniques. Detects and maps radiopharmaceuticals in patients' bodies, using imaging cameras to produce photographic or computer-generated images for interpretation. Calculates, measures, and records patient radiation dosage. Receives, tracks, stores, and disposes of radioactive materials, following radiation safety procedures. Explains safety precautions and medical procedures to patients. Records and processes results of procedures. Performs quality control procedures for imaging and non-imaging equipment. Trains or supervises students or subordinate Nuclear Medicine Technologists.

1.6.4. Diagnostic Medical Sonographer (DMS). Operates sonography equipment capable of portability, doppler-wave, color flow doppler and 3D/4D imaging. Performs abdominal sonography, breast sonography, obstetric sonography, vascular sonography, portable exams in Emergency Department (ED), Intensive Care Unit (ICU), Multi-Service Unit (MSU), and more. Assists radiologist in sterile procedures to include proper room set-up. Functions as a delegated agent of the physician acquiring images for Radiologist review. Sonographers use independent, professional, ethical judgement, and critical thinking to safely perform diagnostic sonographic procedure. Responsibilities include but are not limited to receiving patients, explain method of procedure, position patient, select correct transducer and imaging protocol. Advises radiologist of urgent preliminary diagnostic evaluation. Provides radiologist with impression of findings after each examination. Participates in shift work, on-call duties as required by Military Treatment Facility (MTF). Performs basic maintenance of machines to ensure operability. Employs proper transducer cleaning technique to include high level disinfectant cleaning in accordance with infection control protocols.

1.6.5. Magnetic Resonance Imaging (MRI) Technologist. Operates MRI equipment to produce diagnostic medical images. Produces scans as per the radiologists' direction and protocol. Screens patients for contraindications conditions per Diagnostic Imaging policy. Explains procedures and safety precautions, assists in the triage of scheduling patients, starts IVs, and positions patients and coils. Trains and precepts students and provide support to new staff. Analyzes patient histories and collaborate with physicians and healthcare professional on proper ordering. Documents contrast reactions and injuries where metal objects were involved. Prepares and administers contrast agents under radiologists’ supervision. Performs regular inspections and

quality assurance of MRI equipment and schedule maintenance and repairs as needed. If unanticipated conditions or anomalies are discovered, extends and modifies procedures to ensure full and accurate diagnostic information is delivered. Performs complex computerized 2D and 3D magnetic resonance imaging of heads, spines, extremities, and bodies to include; specialized cardiac imaging, adult and pediatric sedation examinations, whole body imaging, cardiac and brain perfusion, brain and whole-body spectroscopy, liver elastography, breast imaging and biopsy procedures. As required by the procedure or the patient's condition, monitors vital signs such as blood pressure and heart rate and notifies radiologist of significant findings. Maintains records of patients examined, examinations performed, views taken, and technical factors used.

1.6.6. Mammography (Mammo) Technologist. Mammography (Mammo) Technologist. Obtain ARRT prior to training for Mammography. Operates mammography equipment to produce diagnostic medical images. Independently performs very difficult and highly specialized procedures that require precise positioning in producing quality mammographic images. Assists and advises co-workers on procedures and protocol. Uses digital format to schedule routine and complex examinations. Determines if special patient preparation is needed. Receives patients and explains procedures to be accomplished. Per protocol, consents patients prior to examinations. Reviews and records pertinent history and supportive clinical data. Secures confidence and cooperation of the patients during examination procedures. Positions patients for mammography examinations. Calculates technical factors to determine proper exposure, density and contrast. Assembles and adjusts accessory equipment making exposure necessary for requested procedures. After viewing mammography films/digital images, independently determines if any additional views are required before releasing patient. Advises radiologist of patient concerns, history and findings on mammographic examinations and notifies radiologist of exams requiring their immediate attention. Stages images for radiologist interpretation. Assists physicians during localization, ultrasound-guided biopsy and stereotactic biopsy procedures. Utilizes database to monitor exam and reporting completion. Print, review, and track patient outcome, patient lab results, and notification to providers. Aids in maintaining equipment, and Quality Control procedures as dictated by law, and local guidance. Precepts students and staff in the performance of mammography and all other pertinent aspects in providing diagnostic quality care.

1.6.7. Interventional Radiography (IR) Technologist. The Cardiovascular-Interventional Technologist, under direct supervision, assists radiologist in performing diagnostic treatment and interventional procedures on adult and geriatric patients according to the department protocol to achieve optimum diagnosis. The Cardiovascular-Interventional Technologist is expected to practice safe procedures and adheres to radiation safety measures under the supervision of the Radiology supervisor or the Radiologist. Determines if special patient preparation is needed. Coordinates care for emergent, inpatient, and special needs patients with the appropriate clinical staff. Performs two patient identifier verification of patients. Performs consent procedures prior to exams requiring written consent from patients. Receives pediatric, adult and geriatric patients, explains method of procedure, positions patient, selects and sets technical factors, sets up and adjusts accessory equipment, and makes exposures necessary for the requested procedure(s). Determines proper instrument technical factors and control settings to ensure correct calculated exposure of targeted body parts. Assures that sterile supplies, contrast materials, catheters, or other required materials are available and in place. Starts Intravenous lines for contrast administration. Scrubs-in and assists the physician in the surgical procedure. Circulates within the procedure room and procures all equipment needed for any given procedure. Maintains a high degree of accuracy and an awareness of all radiation and patient safety issues involved with

any invasive procedure. Recognizes and resolves equipment problems and discrepancies, anticipate patient needs and concerns, and determine the appropriate care needed. Transports patients within department, to and from waiting area as required. Follows infection control and safety guidelines. The ability to communicate effectively and work as a team member in a high stress environment is essential. The Cardiovascular-Interventional Technologist must understand and accept the possibility of exposure to inside environmental conditions, such as radiation, noise, infectious/communicable diseases, blood and blood borne diseases, chemicals and/or chemical fumes, odors, gases and dusts. Prepared to handle frequent exposures to distressed patients, families or visitors. Precepts students and staff in the performance of IR and all other pertinent aspects in providing diagnostic quality care.

1.6.8. Picture Archiving and Communication System (PACS) Administrator (Imaging Informatics). MTF's that have local radiologists, or support teleradiology services should have PACS administrators. The Unit Manning Document (UMD) will identify these positions with the "N" prefix, SEI 264, and an assignment availability code (AAC) 43. The PACS administrator has the clinical healthcare and information technology experience to support and maintain imaging informatics workflow in Radiology and other imaging departments. This includes but is not limited to managing third party components, data integrity, equipment quality control, operating systems and networks, EHR Radiology interface and voice dictation systems. The PACS Administrator will also be responsible for managing the regional archive and enterprise systems hosted at their facility. They are also responsible for the support of connected teleradiology spoke systems. The administrator is responsible for securing and maintaining network integrity, obtaining equipment and software certifications, and ensuring system security. The PACS administrator will receive general direction and guidance from the DHA Integrated Clinical Systems (ICS) PACS Project Management Office (PMO) and local Information Systems department. The PACS administrator is the point of contact for any issues that arise and will coordinate troubleshooting efforts with the vendor. The vendor is to provide adequate customer support in a timely manner and if the PACS administrator is not receiving assistance, they are to contact the ICS PMO. The administrator will also review the Service Maintenance Agreement for any discrepancies of missing equipment or equipment that can be removed. Furthermore, the PACS Administrator serves as liaison between the medical group and DHA system support agencies in facilitating software and hardware upgrades, service and repairs, and necessary facility modifications.

2. All AFSCs.

2.1. Performs and supervises general diagnostic imaging activities. Performs two patient identifier verification of all patients. Receives patients, schedules appointments, reviews patient questionnaires, explains procedures/actions to allay fears and to secure maximum cooperation. Observes and reports patient responses to instructions, movement, touch, etc., if significant. Monitors patient condition during examination and, if necessary, renders emergency aid and summons assistance. Provides all pertinent information to radiologist or physician within the scope of their responsibility to assist in the interpretation of results. Cleans, inspects, and performs preventive maintenance on equipment. Selects imaging protocols, utilizes required accessories, and makes adjustments based on the specific examination requirements. Records and processes the image. Ensures quality and optimizes the recorded image using computer applications to produce diagnostic images. Enters and maintains data in the PACS, EHR, RIS and HIS. Assists with phase II didactic and performance training, evaluation and counseling of

students, and maintenance of student academic records. Participates in formal research projects.

2.2. Establishes and maintains standards, guidelines, and practices. Composes protocols. Prepares routine positioning guides and technique charts. Reviews images to ensure quality standards are met. Performs equipment quality control checks. Monitors personnel to ensure protective procedures such as those in the As Low As Reasonably Achievable (ALARA) radiation safety, hazardous material communications, and Air Force occupational safety and health programs are followed. Performs tests on radiation protection equipment. Assesses staff competence and monitors appropriateness of care and completeness of examination requests.

2.3. Plans, organizes, and supervises diagnostic imaging activities. Analyzes workload and establishes production controls and performance standards for administrative and technical activities. Coordinates on interdepartmental issues that interface with diagnostic imaging. Prepares and implements financial plan and monitors and analyzes annual expenditures. Prepares equipment purchase requests and justifications. Monitors equipment performance and preventive maintenance activities. Recommends new equipment procurement.

3. Skill and Career Progression. Adequate training and timely progression from the apprentice to the superintendent skill level play an important role in the Air Force's ability to accomplish its mission. It is essential that everyone involved in training do their part to plan, manage, and conduct an effective training program. The guidance provided in this part of the CFETP will ensure each member receives viable training at appropriate points in their career.

Training Decisions

4. This CFETP uses a building block approach (simple to complex) to encompass the entire spectrum of training requirements for the Diagnostic Imaging Career Field. The spectrum includes a strategy for when, where, and how to meet these training requirements. Our strategy is apparent and affordable, eliminates duplication, and prevents a fragmented approach to training. The following decisions regarding training within the 4R0X1 career field were made during the STRT held at Fort Sam Houston, Texas, in April 2023. Training decisions made for this AFS have been and must continue to be made with the full understanding of their impact on the external civilian accreditation of the programs.

5. Community College of the Air Force (CCAF). Legacy members who were enrolled in CCAF and completed formal training had until 31 Dec 2022 for award of the CCAF associate degree. Members should consult with CCAF for additional information.

5.1. CCAF Instructor Certification (CIC) Program. CCAF offers the three-tiered CIC Program for qualified instructors teaching at CCAF affiliated schools who have demonstrated a high level of professional accomplishment. The CIC is a professional credential that recognizes the instructor's extensive faculty development training, education and qualification required to teach a CCAF course, and formally acknowledges the instructor's practical teaching experience.

5.1.1. CCAF Instructional Systems Development (ISD) Certification Program. CCAF offers the ISD Certification Program for qualified curriculum developers and managers who are formally assigned at CCAF affiliated schools to develop and manage CCAF collegiate courses. The ISD Certification is a professional credential that recognizes the curriculum developer’s or manager’s extensive training, education, qualifications and experience required to develop and manage CCAF courses. The certification also recognizes the individual’s ISD qualifications and

experience in planning, developing, implementing and managing instructional systems.

5.1.2. Air Force Credentialing Opportunities On-Line (AF COOL). The AF COOL Program is managed by CCAF and provides a research tool designed to increase an Airman's awareness of national professional credentialing and funding opportunities available for all Air Force occupational specialties. AF COOL also provides information on specific occupational specialties, civilian occupational equivalencies, AFSC-related national professional credentials, credentialing agencies, and professional organizations. AF COOL contains a variety of information about credentialing and licensing and can be used to:

- Get background information about civilian licensure and certification in general and specific information on individual credentials including eligibility requirements and resources to prepare for an exam.
- Identify licenses and certifications relevant to an AFSC.
- Learn how to fill gaps between Air Force training and experience and civilian credentialing requirements.
- Get information on funding opportunities to pay for credentialing exams and associated fees.
- Learn about resources available to Airmen that can help them gain civilian job credentials.

To learn more about AF COOL and funding processes, members should consult their local education office and unit training manager.

5.1.3. Air University Associate to Baccalaureate Cooperative Program (AU ABC Program). Directs Airmen with Associate in Applied Science Degrees from the CCAF to a collection of accredited military friendly colleges and universities to consider when completing a four-year degree. The program maximizes the application of military career education and training and provides a multitude of online academic and support services for the enlisted member.

5.1.4. Additional Off-Duty Education. Off-Duty education is a personal choice that is encouraged for all. Individuals desiring to become an Air Education and Training Command Instructor should be actively pursuing an associate degree. A degreed faculty is necessary to maintain accreditation through the Southern Association of Colleges and Schools.

5.1.5. Degree Requirements. All Airmen are automatically entered into the CAHS/CCAF program. Degree programs consist of a minimum of 64 semester hours (SH). Prior to completing an associate degree, the 5-skill level must be awarded, and the following requirements must be met:

Diagnostic Medical Sonography 4R0X1B

Program Technical Core	Max Sem Hrs
CCAF Specialty Internship (TC-1)	18
Clinical Sonography Practicum I (TC-2)	8
Clinical Sonography Practicum II (TC-3)	18
Principles of Ultrasound Physics & Instrumentation (TC-4)	6
Sonographic Scanning (TC-5)	10
Technical Electives	
American Registry of Radiologic Technologist Certification (TE-1)	12
Computer Science (TE-2)	6

Magnetic Resonance Imaging 4R0X1C

Program Technical Core	Max Sem Hrs
CCAF Specialty Internship (TC-1)	18
Diagnostic Imaging Anatomy & Physiology (TC-2)	6
Diagnostic Imaging Clinical Practicum (TC-3)	12
Diagnostic Imaging Physics (TC-4)	6
Diagnostic Imaging Procedures (TC-5)	14
Diagnostic Imaging Functions (TC-6)	6
Introduction to Diagnostic Imaging Technology (TC-7)	6
Technical Electives	
Advanced Diagnostic Imaging Procedures (TE-3)	12
American Registry of Radiologic Technologists Certification (TE-4)	12
Computer Science (TE-2)	6
Diagnostic Imaging Clinical Education/Internship (TE-5)	12
Medical Readiness (TE-6)	3

5.1.5.1. Technical Education (24 semester hours). A minimum of 12 semester hours of Technical Core subjects and courses must be applied and the remaining semester hours applied from Technical Core or Technical Elective subjects and courses.

5.1.5.2. Leadership, Management, and Military Studies (6 Semester hours). Professional military education, civilian management courses accepted in transfer and/or by testing credit.

5.1.5.3. Physical Education (4 Semester Hours). This requirement is satisfied by completion of basic military training.

5.1.5.4. General Education (15 Semester hours). Applicable courses must meet the criteria for application of courses to the General Education Requirements (GER) and be in agreement with the definitions of applicable General Education subject/courses as provided in the *CCAF General Catalog.*

5.1.5.5. Program Elective (15 Semester Hours). Satisfied with applicable Technical Education; Leadership, Management, and Military Studies; or General Education subjects and courses, including natural science courses meeting GER application criteria. Nine (9) semester hours of CCAF degree applicable technical credit otherwise not applicable to this program may be applied. See the *CCAF General Catalog* for details regarding the Associates of Applied Sciences

degree for this specialty.

5.1.5.6. Additional Information. Off-duty education is highly encouraged for professional development. Individuals desiring to become AETC instructors must possess, as a minimum, an associate degree or be within 1 year of completion (45 semester hours). A degreed faculty is necessary to maintain accreditation through the Southern Association of Colleges and Schools.

5.1.5.6.1. Individual required to support after hour operations while on-call will be exempt from working normal operations the following day. This measure is aimed at preserving the health and safety of 4R0X1 members and can only be overridden by the Squadron Commander.

6. College of Allied Health Sciences (CAHS) Degree Requirements. 4R personnel that graduate from Diagnostic Imaging Phase II training course L5ABO4R031 02AB after 1 Jan 2021 must have completed the CCAF Associate's Degree by 31 Dec 2022. Figure 6.0 identifies degree plan and pathway requirements under CAHS which went into effect 1 Jan 2021.

6.1. College of Allied Health Sciences degree plan & completion pathway.

Note: Please visit the below location for the most current CAHS degree requirements.

https://cahs.usuhs.edu/academic/associates

ALLIED HEALTH
Uniformed Services University

Uniformed Services University

COLLEGE OF ALLIED HEALTH SCIENCES

DEGREE PLAN & COMPLETION PATHWAY

Degree: Associate of Science in Health Sciences (ASHS) **Major: Radiologic Technologist (Air Force)**

The ASHS degree requires at least 60 semester hours with:

- GPA of at least 2.0 and a grade of C or better in all courses
- Residence of at least 25% of the degree plan
- General Education of at least 30 semester hours
- Major Field of Study of at least 15 semester hours
- General Electives up to 15 semester hours (if needed to achieve 60 semester hours)

General Education Requirements (30)		Hours
Communication (6)		
Oral	Transfer Coursework	3
Written Comm I	Transfer Coursework	3
Quantitative Health Science (9)		
RADT 2302*	**Calculations in Rad-Bio Protection**	**3**
RADT 2301*	**Anatomy & Physiology for Rad Tech**	**3**
RADT 1302*	**Princ Radiographic Imaging w/Lab**	**3**
Human Science (6)		
RADT 2308*	**Ethical Considerations for Rad Tech**	**3**
Social Science	Transfer Coursework	3
General Education (9)		
RADT 2505*	**Rad Proc Extremities w/Lab**	**5**
RADT 2407*	**Advanced Medical Imagining w/Lab**	**4**
General Education Requirements Total		**30**

Major / General Electives Requirements (30)		Hours
Major Technical Field of Study (30)		
RADT 1101*	**Introduction to Radiology**	**1**
RADT 2506*	**Rad Proc Skull & Spine w/Lab**	**5**
RADT 2207*	**Rad Proc Thorax & Abdomen w/Lab**	**2**
RADT 2901*	**Clinical Practicum I**	**9**
RADT 2902*	**Clinical Practicum II**	**9**
RADT 2903*	**Clinical Practicum III**	**9**
Major / General Electives Requirements Total		**35**

**These courses are part of the Radiological Technologist core requirement for Air Force personnel and fulfill resident credit requirements.*

Degree Completion Plan:

Requirement	Recommended Coursework	Hours Needed**	Proposed Coursework
Oral Comm	Speech / Public Speaking	3	Transfer (CLEP, AP, DANTES, TA, etc.)
Written Comm I	Composition I	3	Transfer (CLEP, AP, DANTES, TA, etc.)
Social Science	Military Science I	3	CCAF Airman Basic Training

*Equivalent coursework may also be considered. This includes CLEP, DANTES, College Board, and other approved mechanisms. **One class minimum.*

To receive the ASHS Radiology Technologist diploma, all CAHS students must:

1) *Complete all recommended coursework above and send official transcript(s) to CAHS.*
2) *Submit CAHS request for graduation.*

As of: 20 May 26, 2020

Version 1 - Plan Effective Date: 26 August 2019 CAHS Program Implemented: 26 August 2019

Figure 6.0. CAHS Radiology Completion Pathway

ALLIED HEALTH
Uniformed Services University

Uniformed Services University

COLLEGE OF ALLIED HEALTH SCIENCES

DEGREE PLAN

Degree: Bachelor of Science in Health Sciences (BSHS)

The BSHS degree requires at least 120 semester hours with:

- GPA of at least 2.0 and a grade of (C-) or better in all courses
- Residence of at least 25% of the degree plan
- General Education of at least 60 semester hours

Prerequisite:

- Completion of the Air Force Radiologic Technologist Program

Major: Nuclear Medicine Technologist (Air Force)

- Upper-level coursework of at least 42 semester hours
- Major Technical Field of Study of at least 30 semester hours
- General Electives (if needed to achieve 120 semester hours)

General Education Requirements (60)		Hours
Communication (9 min)		
Oral	Transfer Coursework	3
Written I	Transfer Coursework	3
Written II	Transfer Coursework	3
Quantitative Science (18 min)		
NMTS 3401*	**Applied Technical Mathematics**	**4**
NMTS 3305*	**Radiation Biology and Pharmacology**	**3**
NMTS 3402*	**Applied Nuclear Physics and Chemistry**	**4**
Quant Sci 1	Transfer Coursework	3
Quant Sci 2	Transfer Coursework	3
Quant Sci 3	Transfer Coursework	2
Human Science (9 min)		
Humanity	Transfer Coursework	3
Social Sci 1	Transfer Coursework	3
Social Sci 2	Transfer Coursework	3
Additional General Education		
Gen Ed	Transfer Coursework	23
General Education Requirements Total (min 60)		**60**

Major and General Elective Requirements (60)		Hours
Major Technical Field of Study (min 30)		
NMTS 3203*	**Radiation Safety**	**2**
NMTS 3604*	**Radiation Instrumentation**	**6**
NMTS 4107*	**Radiation Safety Admin and Senior Rotation**	**10**
NMTS 4124*	**Diagnostic Imaging I**	**12**
NMTS 4125*	**Diagnostic Imaging II**	**12**
NMTS 4201*	**Advanced Radionuclear Procedures**	**2**
NMTS 4303*	**Healthcare Admin and Patient Care**	**3**
NMTS 4402*	**Advanced Diagnostic Procedures**	**4**
NMTS 4906*	**Radiopharmacy, Nuclear Lab, and Therapy Imaging**	**9**
Major and General Elective Requirements Total (min 60)		**60**

**These courses are part of the Nuclear Medicine Technologist core requirements for Air Force personnel and fulfill CAHS' residency requirements.*

To receive the BSHS degree, the student must:

1) *Complete all coursework above and send official transcript(s) to CAHS.*
2) *Submit CAHS request for graduation.*

Figure 6.1. CAHS Nuclear Medicine Completion Pathway

7. Career Field Path. The career pyramid, found at Figure 7.1., pictorially reflect job and skill progression pattern. The training and functions are aligned with rank and experience levels normally expected of someone in that period of his or her career. For instance, special duty assignments are normally not part of an individual's career until they reach the grade of SSgt. We realize there will be exceptions, but you should use this as a guide to help determine training expectations and career planning. We strongly recommend FMs, superintendents, and supervisors rotate 3- and 5-skill level personnel through all major career tracks (displayed on the pyramid) to better prepare them for supervisory and management responsibilities of the 7- and 9-skill levels.

7.1. Enlisted Career Path. The grade requirements for earliest sew-on times and high year tenure (HYT) are reflections of established policy. Figure 7.2. provides examples of specific special duty assignments and college education levels encouraged at each rank. Individuals should use this information to guide them through their career progression.

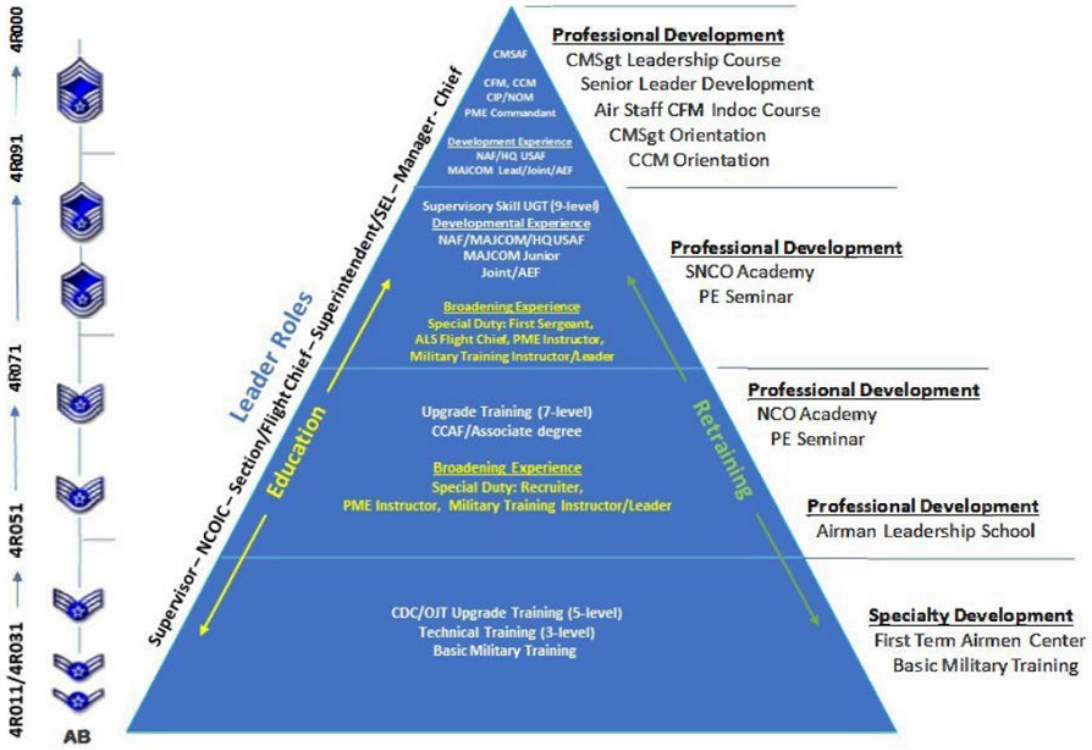

Figure 7-1. Enlisted Career Pyramid

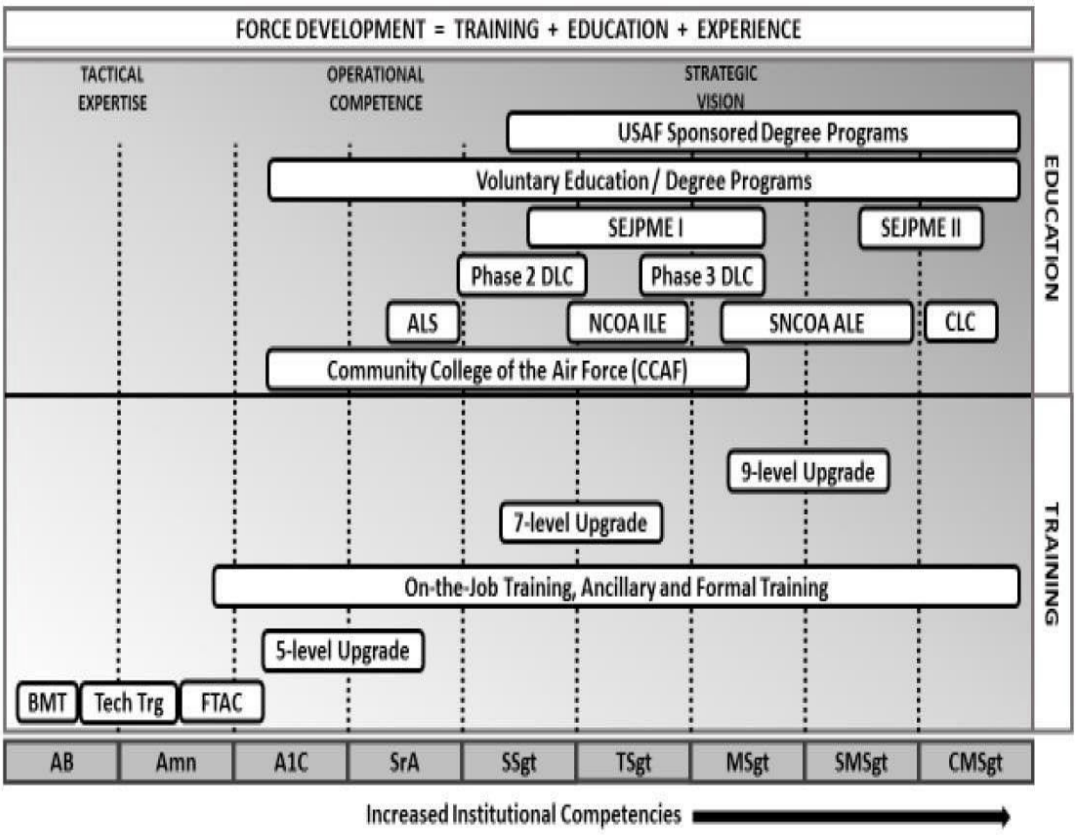

Figure 7-2. Enlisted Education and Training Path

Section D – Skill Level Training Specialty Requirements.

1. Purpose. Skill level training requirements in this specialty are defined in terms of tasks and knowledge requirements. This section outlines the specialty qualification requirements for each skill level in broad, general terms and establishes the mandatory requirements for entry, award, and retention of each skill level. The specific task and knowledge training requirements are identified in the STS at Part II, Section A and B of this CFETP.

2. Apprentice Level (3-Skill Level) Training:

2.1. Knowledge. 4R031/A/B/C. Human anatomy and physiology; medical terminology and ethics; legal aspects of medicine; healthcare accreditation standards; radiation physics, biology, and protection; basic electronics theory; techniques of operating x-ray and specialized diagnostic imaging equipment; radiographic positioning; patient care and monitoring techniques; image recording media and processing techniques; quality control procedures; aseptic and sterile techniques; reactions to contrast media; cardiopulmonary resuscitation; methods of recording the fluoroscopic image; patient and equipment safety budget preparation and execution; and medical records administration. **NOTE: Shreds.** Reinstatement of the 4R0X1 as the primary AFSC can be considered after the member has served 54 months in the shred. If a member is serving as a 4R0X1A/B/C in an OCONUS assignment, the member must serve the full initial tour prior to reinstatement. If a member serving in a shred is selected for and accepts a CONUS assignment, a 2-year commitment to serve in the particular shred at the new duty station is required. Coordination with the CFM, ACFM, and MFM is required prior to removing a shred. Submit a letter with concurrence from local flight and squadron approval to the respective FM. If local leadership removes a shred without coordination with the CFM, ACFM, and MFM or utilizes a shred qualified member in another capacity, it does not

automatically qualify for a backfill for the skillset.

2.1.1. 4R031A. Algebra, nuclear physics, clinical chemistry, nuclear pharmacology, and Nuclear Regulatory Commission regulations concerning use of radionuclides.

2.1.2. 4R031B. Basic principles of Ultrasound Physics and instrumentation, preparation and maintenance of ultrasound equipment, imaging techniques and protocols of the abdomen, small parts, obstetrics/gynecology, superficial structures, and vascular studies. Image analyzation and patient bedside manner.

2.1.3. 4R031C. Magnetic physics, magnetism, magnetic safety, and radio frequency; techniques of operating MRI equipment; and advanced knowledge of sectional anatomy applicable to MRI.

2.2. Education. For entry into this specialty, completion of high school or general education development equivalency with successful completion of courses in algebra, and biology or general science are mandatory. The following college course are required: English Composition I (3 credits) and Speech (3 credits). AP exam English Composition (minimum score of 3) is accepted in place of English Composition I. Successful completion of high school or collegiate courses in chemistry and physics is desirable.

2.3. Training.

2.3.1. Radiography. For award of 4R031 AFSC, completion of the Diagnostic Imaging Apprentice Course Phase I (L5AQJ4R031 01AB) and Phase II (L5ABO4R031 02AC) is mandatory.

2.3.2. Computed Tomography. Individuals will complete the ASRT's CT Basics 2.0 course through distance learning (currently Relias). The ONLY exception to completing the "CT Basics 2.0" course is if a member holds a current registry in CT from ARRT or NMTCB. For these members, the Relias Health online portion of the training is optional yet highly encouraged. STS tasks must still be signed off for licensed members to perform CT exams.

2.3.3. Mammography. Completion of the Medical Technology Management Institute (MTMI) Initial Mammography Training Course (In residence/virtual).

2.3.4. Interventional Radiology. Individuals will complete the ASRT's Vascular-Interventional Essentials course through distance learning (currently AFMS Relias Healthcare site).

2.3.5. Nuclear Medicine (A-Shred). Completion of Nuclear Medicine Phase I (L5ALJ4R031A01AA), and Nuclear Medicine Phase II (L5ABO4R031A02AA) is mandatory for the award of the 3-skill level in the A-shred.

2.3.6. Diagnostic Medical Sonography (B-shred). Completion of Diagnostic Medical Sonography Phase I (L5ALJ4R031B01AA), and Diagnostic Medical Sonography Phase II (L5ALO4R031B02AB) is mandatory for award of the 3-skill level in the B-shred.

2.3.7. Magnetic Resonance Imaging (C-shred). Completion of the MRI Course (L5ALO4R031C00AA) is required for award of the 3-skill level in the C-shred.

2.3.8. PACS Administrators (N-Prefix). PACS administrators require dedicated and trained

diagnostic imaging personnel who have completed the training requirements specified in the Digital Imaging Functions (PACS), Imaging Information Systems, Hospital Information Systems section of the STS, the Advanced PACS Administration (N-Prefix) section of the STS, the AF Form 797 for PACS administrators, and must obtain their COMPTIA SEC + certification which will allow network/remote access across all MTFs. Members should also be in compliance with DoD Directive 8570.01 Chapter 3 and DoD Directive 8140.01. It is highly recommended that PACS administrators attend training opportunities available for the systems at their site.

2.4. Experience. N/A

2.5. Retraining Requirements. Selection for diagnostic imaging shred-out training (Nuclear Medicine/4R0X1A, Diagnostic Medical Sonography/4R0X1B, and Magnetic Resonance Imaging/4R0X1C) requires award of the 5-skill level in radiography prior to acceptance into the shred training course.

2.6. Training Sources and Resources. Completion of the diagnostic imaging apprentice course Phase I (L5AQJ4R031 01AB) and Phase II (L5ABO4R031 02AC) satisfies the training requirements specified in the specialty qualification section (above) for award of the 3-skill level.

2.7. Implementation. Apprentice (3-skill level) training begins with entry in the diagnostic imaging apprentice course (Phase I). Satisfactory completion of the course (Phase I and Phase II) results in award of the 3-skill level. Job qualification training starts when graduates are assigned to their first duty position. Thereafter, it is initiated any time an individual is assigned duties he/she is not qualified to perform.

3. Journeyman (5-Level) Training Requirements.

3.1. Specialty Qualification.

3.1.1. Knowledge. Human anatomy and physiology; medical terminology and ethics; legal aspects of medicine; healthcare accreditation standards; radiation physics, biology, and protection; basic electronics theory; techniques of operating x-ray and specialized diagnostic imaging equipment; radiographic positioning; patient care and monitoring techniques; image recording media and processing techniques; quality control procedures; aseptic and sterile techniques; reactions to contrast media; cardiopulmonary resuscitation; methods of recording the fluoroscopic image; patient and equipment safety; budget preparation and execution; and medical records administration.

3.1.2. Education. N/A

3.1.3. Training. For the basic AFSC, SEI and all shred-outs, the following actions are required for award of the 5-skill level AFSC:

(a) Complete all STS core tasks (identified by an (5) in column 2 of the STS).

1. (1) For facilities lacking CT and/or PACS capabilities the STS Core tasks required for the award of the 5-skill level AFSC is waiverable through coordination with the CFM, ACFM, and MFM.

(b) Complete all STS tasks for the assigned duty position.

(c) Receive supervisor recommendation and commander approval.

(d) Reserve components are allowed and highly encouraged to participate in seasoned training after Phase II.

3.1.4. Experience.

3.1.4.1. 4R0X1. Qualification and possession of AFSC 4R031. Also, experience operating x-ray equipment, and producing and processing radiographs. There is no required minimum time in training for upgrade to 5-skill level.

3.1.4.2. 4R051A/B/C. Prior qualification in and possession of AFSC 4R031A/B/C respectively. Also, experience performing applicable shred (nuclear medicine, diagnostic medical sonography, or magnetic resonance imaging) functions and activities.

3.1.4.3. Selection for PACS Administrator (N-Prefix) position requires possession of the 5-skill level and minimum rank of SSgt. Additionally, must obtain Security + (Plus) certification prior to selection process.

3.1.4.4. Mammography. Personnel performing mammography duties must possess a 5-skill level, be registered in radiography through the ARRT and meet all other training/experience requirements specified in the Mammography Quality Standards Act. All technologists completing the AF Mammography Course and completing 6 months OJT will be assigned the 460 SEI.

3.1.4.5. Selection for the Computed Tomography 478 SEI requires possession of the 5-skill level, 6-months experience and completion of all CT wartime tasks and the CMRP checklist. Individuals will complete the ASRT's CT Basics 2.0 course through distance learning (currently Relias). The ONLY exception to completion of the "CT Basics 2.0" course is if a member holds a current registry in CT from ARRT or NMTCB. For these members, the Relias Health online portion of the training is optional, yet highly encouraged. The STS tasks must still be signed off for licensed members to perform CT exams.

3.1.5 Training Sources and Resources. The STS identifies all core tasks required for qualification. Upgrade and qualification training are provided by qualified trainers using available resources.

3.1.6. Implementation. Entry into 5-skill level upgrade training is initiated upon arrival at the first permanent duty station, following graduation from Phase II training. Qualification training is initiated any time an individual is assigned duties he/she is not qualified to perform.

4. Craftsman (7-Level) Training Requirements.

4.1. Specialty Qualification.

4.2. Knowledge. Human anatomy and physiology; medical terminology and ethics; legal aspects of medicine; healthcare accreditation standards; radiation physics, biology, and protection; basic electronics theory; techniques of operating x-ray and specialized diagnostic imaging equipment; radiographic positioning; patient care and monitoring techniques; image recording media and processing techniques; quality control procedures; aseptic and sterile techniques; reactions to contrast media; cardiopulmonary resuscitation; methods of recording the fluoroscopic image; patient and equipment safety budget preparation and execution; medical records administration; and department administration and management.

4.3. Education. N/A

4.4. Training. The following actions are required for award of the 7-skill level AFSC:

(a) Be trained on all STS core tasks (identified by an (7) in column 2 of the STS).

(b) Be trained on all STS tasks for the assigned duty position.

(c) Minimum grade of SSgt.

4.5. Experience.

4.5.1. 4R071. Prior qualification and possession of AFSC 4R051. Also, experience performing or supervising functions such as producing radiographs, assisting with fluoroscopy and special radiographic procedures. There is no required minimum time in training for upgrade to 7-skill level.

4.5.2. 4R071A/B/C. Prior qualification in and possession of AFSC 4R051A/B/C respectively. Also, experience performing or supervising nuclear medicine, diagnostic medical sonography, or MRI functions and activities.

4.5.3 Training Sources and Resources. The STS identifies all core tasks required for qualification. Upgrade and qualification training are provided by qualified trainers using technical references listed in the STS, Part II, Section A of this CFETP.

4.5.4. Implementation. Entry into 7-skill level upgrade training is initiated when an individual possesses the 5-skill level and is selected for promotion to the rank of Staff Sergeant. Upgrade training may begin on the first day of the first month of the promotion cycle in which the individual has been selected for promotion. Qualification training is initiated any time an individual is assigned duties he/she is not qualified to perform.

5. Superintendent (9-Level) Training Requirements.

5.1. Specialty Qualification.

5.2.1. Knowledge. Human anatomy and physiology; medical terminology and ethics; legal aspects of medicine; healthcare accreditation standards; radiation physics, biology, and protection; basic electronics theory; techniques of operating x-ray and specialized diagnostic imaging equipment; radiographic positioning; patient care and monitoring techniques; image recording media and processing techniques; quality control procedures; aseptic and sterile techniques; reactions to contrast media; cardiopulmonary resuscitation; methods of recording the fluoroscopic image; patient and equipment safety; budget preparation and execution; medical records administration; medical service organization and function, medical administrative procedures; personnel management and administration, Nuclear Regulatory Commission regulations governing medical use of radioisotopes, applicable environmental protection standards, management of non-military personnel, applicable accreditation standards and inspection procedures.

5.2.2. Education. N/A

5.2.3. Training. N/A

5.2.4. Experience. Prior qualification in and possession of AFSC 4R071, 4R071A, 4R071B, or 4R071C. Also, experience managing radiologic, nuclear medicine, diagnostic medical sonography, or MRI functions and activities; mandatory experience of medical service organization and function, medical administrative procedures, medical supply procedures, medical equipment management procedures, personnel management and administration, Nuclear Regulatory Commission regulations governing medical use of radioisotopes, applicable environmental protection standards, management of non-military personnel, applicable

accreditation standards and inspection procedures, and preparation and execution of budgets.

5.3. Training Sources and Resources. Required PME and intermediate qualifications.

5.4. Implementation. Entry into 9-skill level training is initiated when an individual is selected for SMSgt and is a fully qualified 7-skill level. Qualification training is initiated any time an individual is assigned duties they are not certified to perform.

Section E – Skill Resource Constraints

1. Purpose. This section identifies known resource constraints, which preclude optimal and desired training from being developed or conducted, including information such as cost and manpower.

2. Narrative explanations of each resource constraint. These include an explanation and impact statement describing what effect each constraint has on training are included. Also included in this section are actions required, office of primary responsibility, and target completion dates. Resource constraints will be, as a minimum, reviewed and updated annually.

2.1. Computed Tomography (CT) has increasingly become a heavily consumed function in the diagnostic imaging field, both in-garrison and in forward medical treatment facilities. As the demand for increased volume and technical expertise has grown, medical treatment facilities have locally created performance-based training standards to produce technologists that meet that facility's basic imaging needs. This limited solution has often resulted in inconsistent, insufficient, low quality CT proficiency. The current training platform produces technologists that understand the fundaments of CT imaging in order to accomplish the mission, but they do not fully understand radiation dose-manipulation, complex exams involving multiple vascular phase or contrast imaging, post-processing concepts, pathology, etc. all of which are critical to safely performing CT imaging.

2.1.1 Additionally, as of 1 July 2016, The Joint Commission (TJC) mandated all CT technologists to have their ARRT registration, 16-hours of didactic training in their prescribed categories and practical experience supervised by a CT ARRT registered technologist or radiologist. As of the CFETP publication date, the Air Force, as well as sister services, have been given an "exception- to-policy" from TJC for an undetermined time period as the field works to formalize CT training within the AFMS in line with TJC standards. This exception to policy is subject to removal at any time TJC concludes MTF's are not conducting training as agreed upon when given the exception. Facilities lacking Computed Tomography capabilities and newly assigned 3-level members to an MTF without capabilities create a gap in that member's proficiency. It is recommended that the MTF establishes an agreement with local medical facilities to close the gap.

2.2. Portable Radiography. Limitations to portable radiography exists due to changes with existing MTF workload. As AOR capabilities are different at various locations, recommend members who are tasked to deploy, and not stationed at a major MTF with portable capabilities attend EMEDS training.

2.3. Diagnostic Medical Sonography. Diagnostic medical sonographers work closely with physicians and radiologists. They provide radiologist with impression of findings after each examination. The primary goal for DMS Phase II to graduate students at a 2c/3c level. It's important to note new graduates will still need spot checks to ensure adequate images until they complete their 5 level. Shortcomings for DMS: At this time is a lack of obstetrics experience

and assigned new 3-level member to an MTF with no obstetrics capabilities creates a gap in that member's proficiency. It is recommended that the MTF creates an agreement with local medical facilities to ensure to close the gap.

2.4. PACS. Radiology in the AFMS has grown from the days of the film file room to an interconnected infrastructures of digital medical systems which encompass various components like PACS, Voice Recognition, EHR, Specialty systems and all radiology modalities. When digital radiography began 20+ years ago, technologists started migrating from file room tasks into the digital world of managing digital files. Through the years the need for dedicated personnel in managing these systems became readily apparent, resulting in the creation of PACS administrators. These individuals were identified at the larger facilities with reading capabilities to coordinate efforts within the MTF, with equipment vendors for maintenance, and more recently throughout DHA (teleradiology) has become globally connected. Other departments have realized that there is a need to manage the storage of images and allow them to be accessible enterprise wide. These departments such as cardiology and ophthalmology are experiencing similar training/staffing issues as they lack the personnel and infrastructure to manage their own PACS. PACS Administrators are essential to the day-to day operations of managing imaging files, fixing disconnects in image information, and supporting the transfer, interpretation, and storage of over 700,000 imaging studies per year. We have 70+ radiology sites with systems, 23 of which provide radiology interpretations for the entire AF through teleradiology. Currently, we train our system administrators through vendor training which costs an estimated $15K per seat. There are 1 to 2 PACS Administrators per site. Training has also been accomplished through OJT which limits our experience level and continuity across all sites. It takes at a minimum 6-12 months to train and code (apply SEI) an administrator for the position. Individuals must be able to obtain their COMPTIA SEC + certification which will allow network/remote access across all MTFs. Threats to maintaining these administrators come in the form of DSD vectoring, local reassignment, 4R reassignments and retraining. 4R reassignments of fully qualified N4R members could possibly be avoided if each site has their PACS administrators on a control tour that is recognized through the stabilized tour guide. Our vendor agreements are limited to only handling break/fix scenarios, and they do not provide preventive and security maintenance to our systems. A manpower study is recommended to be conducted to identify shortcomings in imaging informatics career field. DHA is moving towards an enterprise-wide Hub and Spoke model for PACs. With the struggles the AF has with maintaining fully qualified PACS administrators it is requested that all active-duty positions be converted to civilian and/or contract positions to maintain continuity for the MTF.

Section F – Transitional Training Guide

1. There are currently no transition training requirements. This area is reserved.

Part II

Section A – Specialty Training Standard (STS)

1. Implementation. The STS's in this CFETP will be used for technical training.

2. Purpose. As prescribed in DAFMAN 36-2689. These STS documents include columns as follows:

2.1. Column 1. Task, Knowledge, and Technical Reference. These are most common tasks, knowledge, and TRs necessary for Airmen to perform duties in the 3-, 5-, and 7-skill level. Number task statements sequentially (i.e., 1.1, 1.2, 2.1).

2.2. Column 2. Core Tasks. Identifies any specialty-wide training requirements for 5 or 7 skill

level, and if the task must be certified when signed off (indicated by "^").

2.3. Column 3. Certification for OJT. These columns are used to record completion of tasks and knowledge training requirements. Use the automated Total Force Training Record (TFTR) or successor system to formally document technician qualifications.

2.4. Column 4. Proficiency codes used to indicate training/information provided. These are the formal training and correspondence course requirements for this specialty. These columns show the proficiency (by skill level and course) to be demonstrated on the job by the graduate as a result of training on the task/knowledge and the career knowledge provided by that training.

3. Qualitative Requirements. Before each STS, this table contains the proficiency code key used to indicate the level of training and knowledge provided by resident training, career development courses, and other courses.

4. Documentation. Use the TFTR to document all technician qualifications. Document and certify completion of training. As a minimum, complete the following columns in Part 2 of the CFETP: Training start date (day, month, and year), training complete date (day, month, and year), Trainee Initials, Trainer Initials, and Certifier Initials (when required).

4.1. Transcribing to new CFETP. Transcribing documentation to a new CFETP is an administrative function, not a reevaluation of training. Upon publication of a new CFETP, transcribe in accordance with DAFMAN 36-2689.

4.2. Documenting Career Knowledge. When a CDC is not available, the supervisor identifies STS training references that the trainee requires for career knowledge and ensures, as a minimum, that trainees cover the mandatory items in DAFMAN 36-2689. **NOTE:** Career knowledge must be documented prior to submitting a CDC waiver request.

4.3. Decertification and Recertification. When a supervisor determines an Airman is unqualified on a task previously certified for his or her duty position, the supervisor deletes certification. Appropriate remarks pertaining to the reason for decertification are entered on the AF Form 623a, *On-The-Job Training Record Continuation Sheet*. Refer to DAFMAN 36-2689. Begin recertification if required.

4.4. Performance Standard. Tasks are trained and qualified to the "Go" level.

5. Promotion Testing. The STS is a guide for development of promotion tests used in the Weighted Airman Promotion System. Senior Noncommissioned Officers with extensive practical experience in their career fields develop Specialty Knowledge Tests (SKTs). The tests sample knowledge of STS subject matter areas judged by test development team members as most appropriate for promotion to higher grades. Questions are based upon study references listed in the *Enlisted Promotions Reference and Requirements Catalog*.

6. Recommendations. Identify inadequacies and recommend changes to this training standard through channels at 59 TRG/TGE, 2931 Harney Road, Fort Sam Houston, TX 78234-7674 or use the Customer Service Information Line (DSN 420-1080; Commercial (210) 808-1080) to report your findings.

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

ROBERT I. MILLER, MD
Lieutenant General, USAF, MC, SFS
Surgeon General

5 Attachments:

1. STS 4R0X1 (Diagnostic Imaging) qualitative requirements with technical reference source summary (includes requirements for SEI 264 and SEI 479).
2. STS 4R0X1 (Mammography, SEI 460 formal course requirements) qualitative requirements with technical reference source summary.
3. STS 4R0X1A (Nuclear Medicine) qualitative requirements with technical reference source summary.
4. STS 4R0X1B (Diagnostic Medical Sonography) qualitative requirements with technical reference source summary.
5. STS 4R0X1C (Magnetic Resonance Imaging) qualitative requirements with technical reference source summary.

STS 4R0X1 Diagnostic Imaging Specialty

This Block Is For Identification Purposes Only		
Name Of Trainee		
Printed Name (*Last, First, Middle Initial*)	**Initials (Written*)***	**SSAN**
Printed Name Of Certifying Official And Written Initials		
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	

QUALITATIVE REQUIREMENTS

Proficiency Code Key		
	Scale Value	**Definition: The individual**
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (Extremely Limited)
	2	Can do most parts of the task. Needs only help on hardest parts. (Partially Proficient)
	3	Can do all parts of the task. Needs only a spot check of completed work. (Competent)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (Highly Proficient)
*Task Knowledge Levels	a	Can name parts, tools, and simple facts about the task. (Nomenclature)
	b	Can determine step by step procedures for doing the task. (Procedures)
	c	Can identify why and when the task must be done and why each step is needed. (Operating Principles)
	d	Can predict, isolate, and resolve problems about the task. (Advanced Theory)
**Subject Knowledge Levels	A	Can identify basic facts and terms about the subject. (Facts)
	B	Can identify relationship of basic facts and state general principles about the subject. (Principles)
	C	Can analyze facts and principles and draw conclusions about the subject. (Analysis)
	D	Can evaluate conditions and make proper decisions about the subject. (Evaluation)

Explanations

* All tasks and knowledge items shown with a proficiency code are trained during war time.
** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.
- This mark is used alone instead of a scale value to show that no proficiency training is provided in the course or CDC.
X This mark is used alone in the course columns to show that training is required but not given due to limitations in resources.
NOTE 1: Training References (TRs) listed in Column 1 and in the bibliography are approved for use in formal course and MTP development.
NOTE 2: Tasks designated with a "5" or a "7" in Column 2 are core tasks for 5- or 7-level UGT respectively. If a core task is required for both skill levels, then "5/7" is posted.
NOTE 3: The AFCFM has determined that tasks will not require a third-party task certifier; therefore, column E does not need a Certifier's Initials for task completion.
NOTE Columns 4 (A1, A2) specify the level of training provided by the 3-skill level resident Phase I and Phase II courses. During OJT, tasks are trained and evaluated to the "Go" level

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
1. MEDICAL READINESS **TR:** AFI 41-106, *Medical Readiness Program* **Note:** Initial Medical Readiness training, directed by AFI 41-106, is provided for enlisted members in the Emergency Medical Readiness course conducted at the 59th Training Group, JBSA Ft Sam Houston, Texas. Completed training is documented on AF Form 1098 for each course graduate. Continuing/on-going Medical Readiness training for the individual is the responsibility of each medical facility.												
1.1. Contingency Operations												
1.1.1. Planning Process								-	-	-	-	-
1.1.1.1. Disaster Team Response							**1a**	-	-	-	-	-
1.1.1.2. Exercise planning/execution/AAR							**1a**	-	-	-	-	-
1.1.1.3. Memorandum of Understanding/ Agreements (MOU/MOA) CMRP checklist/Gap Analysis							**1a**	-	-	-	-	-
1.1.1.4. Revise Contingency Plans							**1a**	-	-	-	-	-
2. CAREER LADDER PROGRESSION **TR:** Air Force Enlisted Classification Directory (AFECD); AFPD 44-1, *Medical Operations;* DAFMAN 36-2689, *Training Program.*												
2.1. USAF Medical Service							-	-	-	-	-	-
2.2. Strategy, Mission & Vision							-	-	-	-	-	-
2.3. Organization							-	-	-	-	-	-
2.4. Career Field Path							-	-	-	-	-	-
2.5. Skill Level Duties							-	-	-	-	-	-
2.6. Shreds Retraining and SEIs Opportunities							-	-	-	-	-	-
3. ORGANIZATIONAL SAFETY												
3.1. AFOSH Standards for AFSC 4R0X1 **TR:** DAFMAN 91-203, *Air Force Occupational Safety Fire and Health Standards*							-	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
3.2. AF Radiation Protection **TR:** DAFMAN 48-125, *Personnel Ionizing Radiation Dosimetry*; Bushong, S. C. (2019). *Radiologic science for technologists: Physics, biology, and protection*, 12th Ed. Mosby; Statkiewicz Sherer, M.A., Visconti, P. J., Ritenour, E. R. & Welch-Haynes, K. (2021). *Radiation Protection in Medical Radiography,* 9th Ed. Mosby.							-	-	-	-	-	-
3.3. Perform radiation protection procedures **TR:** AFMAN 48-148, *Ionizing Radiation Protection*; DAFMAN 48-125, *Personnel Ionizing Radiation Dosimetry*; Bushong, S. C. (2019). *Radiologic science for technologists: Physics, biology, and protection*, 12th Ed. Mosby; Statkiewicz Sherer, M.A., Visconti, P. J., Ritenour, E. R. & Welch-Haynes, K. (2021). *Radiation Protection in Medical Radiography,* 9th Ed. Mosby	*						**2b**	**3c**	-	-	-	-
3.4. INFECTION CONTROL **TR:** Lampignano, J. P. & Bontrager, K. L. (2014). *Textbook of radiographic positioning and related anatomy*, 8th Ed. Mosby Elsevier; Callaway, W. J. (2022). *Mosby's comprehensive review of radiography: The complete study guide and career planner*, 8th Ed. Mosby.												
3.4.1. Concepts of Infection Control	*						**B**	-	-	-	-	-
3.4.2. Employ standard precautions	*						**a**	**3c**	-	-	-	-
3.4.3. Perform aseptic techniques	*						**a**	**3c**	-	-	-	-
3.4.4. Performs equipment cleaning	*						**1b**	**3c**	-	-	-	-
4. PATIENT CARE **TR:** Ehrlich, R. A., & Daly, J. A. (2009). *Patient care in radiography: With an introduction to medical imaging*, 7th Ed. Mosby Elsevier; Callaway, W. J. (2022). *Mosby's comprehensive review of radiography: The complete study guide and career planner*, 8th Ed. Mosby; Wilson, B. G. (1997). *Ethics and basic law for medical imaging professionals.* 1st Ed. F.A. Davis; Williams, P. A. (2022). *Fundamental Concepts and Skills for Nursing,* 6th Ed. Saunders. Callaway, W. J. (2022).												
4.1. Professional standards of ethics							**B**	-	-	-	-	-
4.2. Professional relations with patients and medical personnel							**B**	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
4.3. Privacy Act and HIPAA **TR:** AFI 33-332, *Air Force Privacy and Civil Liberties Program*; AFI 41-200, *Health Insurance Portability and Accountability Act (HIPAA)*							**B**	**-**	**-**	**-**	**-**	**-**
4.4. Demonstrate professional written and verbal communication skills							**-**	**-**	**-**	**-**	**-**	**-**
4.5. Patient preparation and procedural education	*						**B**	**-**	**-**	**-**	**-**	**-**
4.6. Patient Assessment	*						**B**	**-**	**-**	**-**	**-**	**-**
4.7. Monitor vital signs	*						**a**	**2b**	**-**	**-**	**-**	**-**
4.8. Use proper body mechanics for patient movement	*						**2b**	**3c**	**-**	**-**	**-**	**-**
4.9. Assist patient to/from wheelchair, gurney & exam table	*						**1a**	**3c**	**-**	**-**	**-**	**-**
4.10. Transport patients	*						**1a**	**3c**	**-**	**-**	**-**	**-**
4.11. Use immobilization devices (Pigg-O- Stat, Velcro straps, etc…)							**a**	**b**	**-**	**-**	**-**	**-**
4.12. Use IV Precautions	*						**a**	**2b**	**-**	**-**	**-**	**-**
4.13. Monitor patients	*						**a**	**2b**	**-**	**-**	**-**	**-**
4.14. Assess patient lab results							**-**	**2a**	**-**	**-**	**-**	**-**
4.15. Perform cardiopulmonary resuscitation	*						**3c**	**-**	**-**	**-**	**-**	**-**
5. IMAGING SERVICE ADMINISTRATIVE DUTIES **TR:** AFI 33-332, *Air Force Privacy and Civil Liberties Program*; AFI 44-102, *Medical Care Management*												
5.1 Diagnostic Imaging Reception Duties												
5.1.1. Process examination imaging requests (Scheduling, Arriving, Ordering, Departing patients - Activate, Start, and Complete)	*						**a**	**2b**	**-**	**-**	**-**	**-**
5.1.2. Navigates EHR applications	*						**a**	**2b**	**-**	**-**	**-**	**-**
5.2. Image Library Functions												
5.2.1. Demonstrate exam loan procedures							**-**	**-**	**-**	**-**	**-**	**-**
5.2.2. Import/Export images							**-**	**1b**	**-**	**-**	**-**	**-**
5.2.3. Understands timelines and disposition of												
5.2.3.1. Routine X-rays							**-**	**-**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
5.2.3.2. Mammography Files							-	-	-	-	-	-
5.2.3.3. Medical-Legal Files							-	-	-	-	-	-
6. QUALITY MANAGEMENT **TR:** AFMAN 48-148, *Ionizing Radiation Protection*; Bushong, S. C. (2019). *Radiologic science for technologists: Physics, biology, and protection*, 12th Ed. Mosby; Carlton, R. R. & Adler, A. M. (2019). *Principles of radiographic imaging: An art and a science*, 6th Ed. Cenage Learning; Papp, J. (2024). *Quality management in the imaging sciences*, 7th Ed. Mosby. Callaway, W. J. (2022). Mosby's comprehensive review of radiography: The complete study guide and career planner, (8th Ed. or later Ed.) Mosby.												
6.1. Quality assurance							**A**	-	-	-	-	-
6.2. Quality control												
6.2.1. Monitoring equipment performance	*						**a**	**2b**	-	-	-	-
6.2.2. Inspect image receptors	*						**a**	**2b**	-	-	-	-
6.2.3. Perform lead protective devices check							-	**2b**	-	-	-	-
6.2.4. Perform image quality control							**1a**	**2c**	-	-	-	-
6.3. Clean image receptors	*						**a**	**2c**	-	-	-	-
6.4. Perform department repeat image analysis (Run report)							-	-	-	-	-	-
7. TECHNICAL ASPECTS OF RADIOLOGY **TR:** Bushong, S. C. (2019). *Radiologic science for technologists: Physics, biology, and protection*, 12th Ed. Mosby; Lampignano, J. P. & Bontrager, K. L. (2014). *Textbook of radiographic positioning and related anatomy*, 8th Ed. Mosby Elsevier; Selman, J. (2000). *The fundamentals of imaging physics and radiobiology: For the radiologic technologist*, 9th Ed. Charles C. Thomas Publishing; Carlton, R. R. & Adler, A. M. (2019). *Principles of radiographic imaging: An art and a science*, 6th Ed. Cenage Learning; Mace, J. D. & Kowalczyk, N. (2008). *Radiographic pathology for technologists*, 5th Ed. Mosby Elsevier; Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, 15th Ed. Mosby; Callaway, W. J. (2022). *Mosby's comprehensive review of radiography: The complete study guide and career planner*, 8th Ed. Mosby. Callaway, W. J. (2022).												

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
7.1. Radiation physics							**B**	**-**	**-**	**-**	**-**	**-**
7.2. X-Ray imaging systems	*						**B**	**-**	**-**	**-**	**-**	**-**
7.3. X-Ray production							**B**	**-**	**-**	**-**	**-**	**-**
7.4. Operate fixed radiographic equipment	*						**2b**	**3c**	**-**	**-**	**-**	**-**
7.5. Operate mobile radiographic equipment	*						**2b**	**3c**	**-**	**-**	**-**	**-**
7.6. Radiobiology							**2b**	**3c**	**-**	**-**	**-**	**-**
7.7. Beam Restriction							**2b**	**3c**	**-**	**-**	**-**	**-**
7.8. Control scatter radiation							**2b**	**3c**	**-**	**-**	**-**	**-**
7.9. Grids							**A**	**-**	**-**	**-**	**-**	**-**
7.10. Select prime exposure factors	*						**2b**	**3c**	**-**	**-**	**-**	**-**
7.11. Image quality evaluation							**B**	**-**	**-**	**-**	**-**	**-**
7.12. Digital radiography												
7.12.1. Computed radiography (CR)	*						**B**	**-**	**-**	**-**	**-**	**-**
7.12.2. Direct Radiography (DR)	*						**B**	**-**	**-**	**-**	**-**	**-**
7.12.3. Acquire images using digital radiography	*						**2b**	**3c**		**-**	**-**	**-**
7.13. Digital imaging process concepts							**B**	**-**	**-**	**-**	**-**	**-**
7.14. Process digital images							**2b**	**3c**	**-**	**-**	**-**	**-**
7.15. Fluoroscopy							**B**	**-**	**-**	**-**	**-**	**-**
8. ANATOMY, PHYSIOLOGY, AND PATHOLOGY **TR:** Tortora, G. J., & Derrickson, B. H. (2020). *Principles of anatomy and physiology*, 16th Ed. Wiley; Ettinger, A. G. & Burch, P. F. (2007). *Medical terminology: For health careers*, 2nd ed. Paradigm Publishing. Callaway, W. J. (2022). Mosby's comprehensive review of radiography: The complete study guide and career planner, (8th Ed. or later Ed.) Mosby.												
8.1. Medical Terminology												
8.1.1. Root, prefix, and suffix							**B**	**-**	**-**	**-**	**-**	**-**
8.1.2. Common medical terms	*						**B**	**-**	**-**	**-**	**-**	**-**
8.2. Body Planes and Positioning	*						**B**	**-**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
8.3. Organization of the body	*						**B**	**-**	**-**	**-**	**-**	**-**
8.4. Structure, function, and pathology of body systems												
8.4.1. Osteology	*						**B**	**-**	**-**	**-**	**-**	**-**
8.4.2. Muscular	*						**B**	**-**	**-**	**-**	**-**	**-**
8.4.3. Respiratory	*						**B**	**-**	**-**	**-**	**-**	**-**
8.4.4. Cardiovascular	*						**B**	**-**	**-**	**-**	**-**	**-**
8.4.5. Digestive							**B**	**-**	**-**	**-**	**-**	**-**
8.4.6. Urinary							**B**	**-**	**-**	**-**	**-**	**-**
8.4.7. Nervous							**B**	**-**	**-**	**-**	**-**	**-**
8.4.8. Endocrine							**B**	**-**	**-**	**-**	**-**	**-**
8.4.9. Reproductive							**B**	**-**	**-**	**-**	**-**	**-**
9. CONTRAST MEDIA ADMINISTRATION **TR:** Ehrlich, R. A., & Daly, J. A. (2009). *Patient care in radiography: With an introduction to medical imaging*, 7th Ed. Mosby Elsevier; Lampignano, J. P. & Bontrager, K. L. (2014). *Textbook of radiographic positioning and related anatomy*, 8th Ed. Mosby Elsevier; Callaway, W. J. (2022). *Mosby's comprehensive review of radiography: The complete study guide and career planner*, 8th Ed. Mosby; Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, 15th Ed. Mosby. Callaway, W. J. (2022).												
9.1. Properties of Contrast Media							**B**	**-**	**-**	**-**	**-**	**-**
9.2. Administer contrast media												
9.2.1. Oral							**a**	**b**	**-**	**-**	**-**	**-**
9.2.2. Rectal							**a**	**b**	**-**	**-**	**-**	**-**
9.2.3. Intravenous							**a**	**b**	**-**	**-**	**-**	**-**
9.3. Perform venipuncture							**a**	**2b**	**-**	**-**	**-**	**-**
9.4. Document contrast media administration (charting medications)							**a**	**2b**	**-**	**-**	**-**	**-**
9.5. Contrast media reactions							**B**	**-**	**-**	**-**	**-**	**-**
9.6. Perform contrast-media reaction procedures							**-**	**2a**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
9.7. Prepare contrast media							-	2a	-	-	-	-
9.8. Assess patients for contraindications prior to contrast administration							a	2b	-	-	-	-
10. ROUTINE IMAGING **TR:** Lampignano, J. P. & Bontrager, K. L. (2014). *Textbook of radiographic positioning and related anatomy*, 8th Ed. Mosby Elsevier; Callaway, W. J. (2022). *Mosby's comprehensive review of radiography: The complete study guide and career planner*, 8th Ed. Mosby; Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, 15th Ed. Mosby. Callaway, W. J. (2022).													
10.1. Produce images of the:												
10.1.1. Upper extremities	*						2b	3c	-	-	-	-
10.1.2. Shoulder girdle							2b	3c	-	-	-	-
10.1.3. Lower extremities	*						2b	3c	-	-	-	-
10.1.4. Pelvic girdle	*						2b	3c	-	-	-	-
10.1.5. Chest	*						2b	3c	-	-	-	-
10.1.6. Abdomen	*						2b	3c	-	-	-	-
10.1.7. Vertebral column	*						2b	3c	-	-	-	-
10.1.8. Ribs							1b	2b	-	-	-	-
10.1.9. Sternum							1b	2b	-	-	-	-
10.1.10. Skull	*						1b	2b	-	-	-	-
10.1.11. Sinuses							1b	2b	-	-	-	-
10.1.12. Facial bones							1b	2b	-	-	-	-
10.1.13. Mastoids and petrous pyramids							-	-	-	-	-	-
10.1.14. Scoliosis surveys							a	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
11. SPECIAL IMAGING **TR:** Lampignano, J. P. & Bontrager, K. L. (2014). *Textbook of radiographic positioning and related anatomy*, 8th Ed. Mosby Elsevier; Callaway, W. J. (2022). *Mosby's comprehensive review of radiography: The complete study guide and career planner*, 8th Ed. Mosby; Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, 15th Ed. Mosby. Callaway, W. J. (2022).													
11.1. Perform:												
11.1.1. Alimentary tract Procedures (Phase II must sign-off on UGI or Contrast Enema)							**1b**	**2b**	**-**	**-**	**-**	**-**
11.1.2. Biliary tract Procedures							**-**	**-**	**-**	**-**	**-**	**-**
11.1.3. Genitourinary tract Procedures							**1b**	**-**	**-**	**-**	**-**	**-**
11.1.4. Arthrogram Procedures							**a**	**2b**	**-**	**-**	**-**	**-**
11.1.5. Scanography Procedures							**-**	**-**	**-**	**-**	**-**	**-**
11.1.6. Fluoroscopy Procedures												
11.1.6.1. Perform mobile fluoroscopy procedures	*						**a**	**3c**	**-**	**-**	**-**	**-**
11.1.6.2. Assist with fixed fluoroscopy procedures							**a**	**2b**	**-**	**-**	**-**	**-**
11.2. Myelography Procedures							**a**	**-**	**-**	**-**	**-**	**-**
11.3. Bone Densitometry Procedures							**-**	**a**	**-**	**-**	**-**	**-**
12. COMPUTED TOMOGRAPHY (SEI 478) **TR:** Kelly, L. & Peterson, C. (2018). *Sectional Anatomy for Imaging Professionals,* 4th Ed. Mosby; Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, 15th Ed. Mosby; Seeram, E. (2022). *Computed Tomography: Physical Principles, Clinical Applications, and Quality Control,* 5th Ed. Saunders. Callaway, W. J. (2022). Mosby's comprehensive review of radiography: The complete study guide and career planner, (8th Ed. or later Ed.) Mosby.													
12.1 Safety												
12.1.1. Radiation	**5**						**A**	**-**	**-**	**-**	**-**	**-**
12.1.2. Mechanical	**5**						**-**	**-**	**-**	**-**	**-**	**-**
12.1.3. Laser	**5**						**A**	**-**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
12.2. Contrast media administration **TR:** Ehrlich, R. A., & Daly, J. A. (2009). *Patient care in radiography: With an introduction to medical imaging*, 7th Ed. Mosby Elsevier; Lampignano, J. P. & Bontrager, K. L. (2014). *Textbook of radiographic positioning and related anatomy*, 8th Ed. Mosby Elsevier; Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, 15th Ed. Mosby. Callaway, W. J. (2022). Mosby's comprehensive review of radiography: The complete study guide and career planner, (8th Ed. or later Ed.) Mosby.												
12.2.1. Oral							**a**	**-**	**-**	**-**	**-**	**-**
12.2.2. Rectal							**a**	**-**	**-**	**-**	**-**	**-**
12.2.3. Intravenous							**a**	**-**	**-**	**-**	**-**	**-**
12.2.4. Perform venipuncture							**a**	**2b**	**-**	**-**	**-**	**-**
12.2.5. Document contrast media administration (charting medications)							**a**	**2b**	**-**	**-**	**-**	**-**
12.2.6. Perform contrast-media reaction procedures							**-**	**2a**	**-**	**-**	**-**	**-**
12.2.7. Prepare contrast media							**-**	**2a**	**-**	**-**	**-**	**-**
12.2.8. Assess patients for contraindications prior to contrast administration	**5**						**-**	**-**	**-**	**-**	**-**	**-**
12.3. Image Formation												
12.3.1. Imaging Parameters							**-**	**-**	**-**	**-**	**-**	**-**
12.3.2. Methods Of Data Acquisition							**A**	**-**	**-**	**-**	**-**	**-**
12.3.3. Image Reconstruction							**-**	**-**	**-**	**-**	**-**	**-**
12.3.4. Post Processing							**-**	**-**	**-**	**-**	**-**	**-**
12.3.5. Attenuation Coefficient							**A**	**-**	**-**	**-**	**-**	**-**
12.3.6. Data Processing							**A**	**-**	**-**	**-**	**-**	**-**
12.4. Image Evaluation and Archiving												
12.4.1. Image Display							**-**	**-**	**-**	**-**	**-**	**-**
12.4.2. Image Quality							**-**	**-**	**-**	**-**	**-**	**-**
12.4.3. Artifact Recognition And Reduction							**-**	**-**	**-**	**-**	**-**	**-**
12.5. CT Cross-Sectional Anatomy												

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
12.5.1. Head	**5**						**A**	-	-	-	-	-
12.5.2. Neck	**5**						**A**	-	-	-	-	-
12.5.3. Chest	**5**						**A**	-	-	-	-	-
12.5.4. Abdomen	**5**						**A**	-	-	-	-	-
12.5.5. Pelvis	**5**						**A**	-	-	-	-	-
12.5.6. Spine							**A**	-	-	-	-	-
12.5.7. Extremities							-	-	-	-	-	-
12.5.8. Vascular							-	-	-	-	-	-
12.5.9. Pathology							-	-	-	-	-	-
12.6. Scanner Operation												
12.6.1. Start CT Unit	**5**						-	**2b**	-	-	-	-
12.6.2. Shutdown CT Unit	**5**						-	**2b**	-	-	-	-
12.6.3. Perform Emergency Shutdown	**5**						-	**2b**	-	-	-	-
12.6.4. Perform Tube Warm-Up	**5**						-	**2b**	-	-	-	-
12.6.6. Transmit CT Images	**5**						-	**2b**	-	-	-	-
12.6.7. Perform CT Quality Assurance Tests	**5**						-	**2b**	-	-	-	-
12.6.8. Operate Power Injector	**5**						-	**2b**	-	-	-	-
12.7. Image Display												
12.7.1. Geometric, Distance, or Region of Interest (ROI) Measurements							-	-	-	-	-	-
12.7.2. Multiplanar Reconstruction (MPR)	**5**						**1a**	-	-	-	-	-
12.7.3. 3D Rendering (MIP, SSD, VR)							-	-	-	-	-	-
12.7.4. Retrospective Reconstruction With Different Parameters (E.G., DFOV, Algorithm, Slice Thickness)	**5**						**1a**	-	-	-	-	-
12.8. Quality Assurance And Quality Control												
12.8.1. Perform Calibration Checks	**5**						**2b**	-	-	-	-	-
12.8.2. CT Number And Standard Deviation (Water Phantom)							-	-	-	-	-	-
12.9. Obtain Images Of The:												

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
12.9.1. Head												
12.9.1.1 Head Without Contrast	**5**						-	**2b**	-	-	-	-
12.9.1.2. Head With Contrast							-	-	-	-	-	-
12.9.1.3. Trauma Head							-	-	-	-	-	-
12.9.1.4. Arteriography Head (CTA)							-	-	-	-	-	-
12.9.1.5. Venography Head (CTV)							-	-	-	-	-	-
12.9.1.6. Brain Perfusion							-	-	-	-	-	-
12.9.1.7. Temporal Bones/IAC							-	-	-	-	-	-
12.9.1.8. without contrast							-	-	-	-	-	-
12.9.1.9. Orbits with contrast							-	-	-	-	-	-
12.9.1.10. Orbits without contrast							-	-	-	-	-	-
12.9.1.11. Sinuses without contrast							-	-	-	-	-	-
12.9.1.12. Sinus with Contrast							-	-	-	-	-	-
12.9.1.13. Facial Bones/Mandible without contrast							-	-	-	-	-	-
12.9.1.14. Facial Bones/Mandible with contrast							-	-	-	-	-	-
12.9.2. Spine												
12.9.2.1. Cervical Spine without contrast	**5**						-	**2b**	-	-	-	-
12.9.2.2. Cervical Spine with contrast							-	-	-	-	-	-
12.9.2.3. Thoracic Spine without contrast							-	-	-	-	-	-
12.9.2.4. Thoracic Spine with contrast							-	-	-	-	-	-
12.9.2.5. Lumbar Spine without contrast							-	-	-	-	-	-
12.9.2.6. Lumbar Spine with contrast							-	-	-	-	-	-
12.9.2.7. Spinal Trauma							-	-	-	-	-	-
12.9.2.8. Sacrum/Coccyx							-	-	-	-	-	-
12.9.2.9. Post Myelography							-	-	-	-	-	-
12.9.3. Musculoskeletal												
12.9.3.1. Upper Extremity							-	-	-	-	-	-
12.9.3.2. Lower Extremity							-	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
12.9.3.3. Shoulder And/Or Scapula							-	-	-	-	-	-
12.9.3.4. Bony Pelvis And/Or Hips	**5**						-	**2b**	-	-	-	-
12.9.3.5. Musculoskeletal Trauma							-	-	-	-	-	-
12.9.3.6. Arteriography Extremity/Runoff (CTA)							-	-	-	-	-	-
12.9.3.7. Venography Extremity (CTV)							-	-	-	-	-	-
12.9.4. Neck												
12.9.4.1. Soft Tissue Neck							-	**2b**	-	-	-	-
12.9.4.2. Arteriography Neck (CTA)							-	-	-	-	-	-
12.9.4.3. Venography Neck (CTV)							-	-	-	-	-	-
12.9.5. Chest												
12.9.5.1. Chest Without Contrast	**5**						-	**2b**	-	-	-	-
12.9.5.2. Chest With Contrast	**5**						-	**2b**	-	-	-	-
12.9.5.3. HRCT							-	-	-	-	-	-
12.9.5.4. Low Dose Lung Screening							-	-	-	-	-	-
12.9.5.5. Chest Trauma							-	-	-	-	-	-
12.9.5.6. Pulmonary Angiography/PE Study (CTPA)							-	-	-	-	-	-
12.9.5.7. Vascular Chest (CTA, CTV, Aorta, SVC)							-	-	-	-	-	-
12.9.5.8. Heart (E.G., Coronary Angiography, TAVR, PVS)	**5**						-	-	-	-	-	-
12.9.5.9. Coronary Artery Calcium Scoring							-	-	-	-	-	-
12.9.6. Abdomen And Pelvis												
12.9.6.1. Abdomen/Pelvis Without Contrast	**5**						-	**2b**	-	-	-	-
12.9.6.2. Abdomen/Pelvis With Contrast	**5**						-	**2b**	-	-	-	-
12.9.6.3. Liver (Multi-Phase)							-	-	-	-	-	-
12.9.6.4. Kidneys (Multi-Phase)							-	-	-	-	-	-
12.9.6.5. Pancreas (Multi-Phase)							-	-	-	-	-	-
12.9.6.6. Adrenals (Multi-Phase)							-	-	-	-	-	-
12.9.6.7. Enterography Study							-	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
12.9.6.8. Appendicitis Study							-	-	-	-	-	-
12.9.6.9. Renal Stone Protocol (Without IV Contrast)							-	-	-	-	-	-
12.9.6.10. Abdominal Trauma							-	-	-	-	-	-
12.9.6.11. Arteriography Abdomen/Pelvis (CTA)							-	-	-	-	-	-
12.9.6.12. Venography Abdomen/Pelvis (CTV)							-	-	-	-	-	-
12.9.6.13. Urogram							-	-	-	-	-	-
12.9.6.14. Retrograde Cystogram							-	-	-	-	-	-
12.9.6.15. Pelvic Trauma							-	-	-	-	-	-
12.9.6.16. Colorectal Studies (Rectal Contrast)							-	-	-	-	-	-
12.9.7. Additional Procedures												
12.9.7.1. Biopsies							-	-	-	-	-	-
12.9.7.2. Drainages							-	-	-	-	-	-
12.9.7.3. Aspirations							-	-	-	-	-	-
12.9.7.4. Pediatric (12 And Under)							-	-	-	-	-	-
12.9.7.5. Arthrography							-	-	-	-	-	-
12.9.7.6. Ablations							-	-	-	-	-	-
12.9.7.7. Myelography							-	-	-	-	-	-
13. PICTURE ARCHIVING AND COMMUNICATION SYSTEM (PACS) **TR:** Carter, C. & Veale, B. (2022). *Digital Radiography and PACS.* 4th Ed. Mosby; Dreyer, K. J., Hirschorn, D. S., Thrall, J. H., & Mehta, A. (2005). *PACS: A guide to the digital revolution* 2nd Ed. Springer. Callaway, W. J. (2022). Mosby's comprehensive review of radiography: The complete study guide and career planner, (8th Ed. or later Ed.) Mosby.													
13.1 Picture Archiving and Communication Systems (PACS)												
13.1.1. System Overview (Terminology/Topology)	**5**						**B**	-	-	-	-	-
13.1.2. Hospital Information System/Radiology Information Systems (HIS/RIS)	**5**						**B**	-	-	-	-	-
13.1.3. Workflow	**5**						**B**	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
13.1.4. Contingency Procedures	**5**						**-**	**-**	**-**	**-**	**-**	**-**
13.1.5. Perform Workflow Process	**5**						**1a**	**2b**	**-**	**-**	**-**	**-**
13.1.6. Perform System Functions	**5**						**-**	**-**	**-**	**-**	**-**	**-**
14. PACS ADMINISTRATOR (N-PREFIX, SEI 264) **TR:** Carter, C. & Veale, B. (2022). *Digital Radiography and PACS.* 4th Ed. Mosby; Dreyer, K. J., Hirschorn, D. S., Thrall, J. H., & Mehta, A. (2005). *PACS: A guide to the digital revolution* 2nd Ed. Springer. Callaway, W. J. (2022). Mosby's comprehensive review of radiography: The complete study guide and career planner, (8th Ed. or later Ed.) Mosby.												
14.1. Management							**-**	**-**	**-**	**-**	**-**	**-**
14.1.1. Understand applicable Service Maintenance Agreements (SMA)							**-**	**-**	**-**	**-**	**-**	**-**
14.1.2. Identify Radiology System Requirements							**-**	**-**	**-**	**-**	**-**	**-**
14.1.3. Network Security Requirements							**-**	**-**	**-**	**-**	**-**	**-**
14.1.4. System Security Requirements							**-**	**-**	**-**	**-**	**-**	**-**
14.1.5. Network Administration							**-**	**-**	**-**	**-**	**-**	**-**
14.1.6. Windows OS Administration							**-**	**-**	**-**	**-**	**-**	**-**
14.1.7. Database Administration							**-**	**-**	**-**	**-**	**-**	**-**
14.1.8. Digital Imaging Communications in Medicine (DICOM)							**-**	**-**	**-**	**-**	**-**	**-**
14.1.9. HL7							**-**	**-**	**-**	**-**	**-**	**-**
14.1.10. IHE							**-**	**-**	**-**	**-**	**-**	**-**
14.2. System Tasks												
14.2.1. Maintain System	**5**						**-**	**-**	**-**	**-**	**-**	**-**
14.2.2. Perform Contingency Procedures	**5**						**-**	**-**	**-**	**-**	**-**	**-**
14.2.3. Configure Security Protocol	**5**						**-**	**-**	**-**	**-**	**-**	**-**
14.2.4. Manage User Profiles	**5**						**-**	**-**	**-**	**-**	**-**	**-**
14.2.5. Perform System Security Check	**5**						**-**	**-**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
15. INTERVENTIONAL RADIOGRAPHY (IR, SEI 479) **TR:** Kandarpa, K., Machan L., & Durham, J. D. (2016) *Handbook of Interventional Radiologic procedures,* 5th Ed. Lippincott, Williams, and Wilkins; Mauro, M.A., Kieran P. J., Thompson, K. R., Venbrux, A. C., & Morgan R. A. (2013). *Image-guided interventions: Expert radiology series,* 2nd Ed. Saunders; Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, 15th Ed. Mosby. Callaway, W. J. (2022). *Mosby's comprehensive review of radiography: The complete study guide and career planner*, (8th Ed. or later Ed.) Mosby.												
15.1. Angiography equipment												
15.1.1. Operate							-	-	-	-	-	-
15.1.2 Image capturing							-	-	-	-	-	-
15.1.3. Manipulate single/biplane							-	-	-	-	-	-
15.1.4. 3D/axial rotation							-	-	-	-	-	-
15.1.5. Ultrasound guidance equipment							-	-	-	-	-	-
15.1.6. Thrombosis equipment							-	-	-	-	-	-
15.1.7. Ablation equipment							-	-	-	-	-	-
15.1.8. Perform start-up/shut down of angiography units							-	-	-	-	-	-
15.1.9. Emergency shut-down of angiography units							-	-	-	-	-	-
15.1.10. Perform single/bi-plane warm- up of angiography units							-	-	-	-	-	-
15.1.11. Operate power injector equipment							-	-	-	-	-	-
15.2. Procedure preparation/operation												
15.2.1. Procedure table							-	-	-	-	-	-
15.2.2. Embolics table							-	-	-	-	-	-
15.2.3. Prepare entry site/sterile field							-	-	-	-	-	-
15.2.4. Perform back table responsibilities							-	-	-	-	-	-
15.2.5. Perform room circulation							-	-	-	-	-	-
15.2.6. Perform scrub technician							-	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
15.2.7 Prepare procedural medication							-	-	-	-	-	-
15.2.8. Assess patients for contraindications prior to IV contrast or medication administration							-	-	-	-	-	-
15.3. Patient Care												
15.3.1. Apply dressing							-	-	-	-	-	-
15.3.2. Closure techniques/devices							-	-	-	-	-	-
15.3.3. Intravascular infusion pump							-	-	-	-	-	-
15.3.4. Perform patient care techniques under scope of providers							-	-	-	-	-	-
15.4. Cardiovascular anatomy							-	-	-	-	-	-
15.4.1. Extremities							-	-	-	-	-	-
15.4.2. Head/neck							-	-	-	-	-	-
15.4.3. Chest/abdomen/pelvis							-	-	-	-	-	-
15.5. Procedural familiarization												
15.5.1. Biopsy							-	-	-	-	-	-
15.5.2. Embolization							-	-	-	-	-	-
15.5.3. Vertebroplasty/kyphoplasty							-	-	-	-	-	-
15.5.4. Ablation							-	-	-	-	-	-
15.5.5 Drain/tube placement							-	-	-	-	-	-
15.5.6 Hemorrhage intervention							-	-	-	-	-	-
15.5.7 Central line placement							-	-	-	-	-	-
15.5.8 Thrombosis							-	-	-	-	-	-
15.5.9 Portacath placement							-	-	-	-	-	-
15.5.10. Stent placement							-	-	-	-	-	-
15.6. Product Familiarization							-	-	-	-	-	-
15.6.1. Needles							-	-	-	-	-	-
15.6.2. Guidelines							-	-	-	-	-	-
15.6.3. Catheters							-	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC
15.6.4. Embolization materials							-	-	-	-	-	-
15.6.5. Stents							-	-	-	-	-	-
15.6.6. Balloons							-	-	-	-	-	-
15.6.7. Sheaths							-	-	-	-	-	-
15.6.8. Dilators							-	-	-	-	-	-
15.6.9. Fistulagram materials							-	-	-	-	-	-
15.6.10. Operate computed tomograph (CT) guided equipment							-	-	-	-	-	-
15.6.11. Vascular procedures							-	-	-	-	-	-
15.6.12. Musculoskeletal procedures							-	-	-	-	-	-
15.6.13. Pulmonary procedures							-	-	-	-	-	-
15.6.14. Gastrointestinal procedures							-	-	-	-	-	-

Technical Reference (TR) Source Summary for STS 4R0X1, Diagnostic Imaging
List of commercial and service publications

Note. Most commercial training references are listed in the following format: Author(s), year of publication, title, edition (if applicable), and publisher. Some non-government publications published by organizations are updated quite often, and these may not include edition numbers, year of publication, or an author. Government publications are listed per that department's naming convention. Later or earlier editions of the same publications are acceptable after evaluation.

Diagnostic Imaging, Sections 1 through 13

Commercial Publications

Bushong, S. C. (2019). *Radiologic science for technologists: Physics, biology, and protection*, (12th Ed. or later Ed.) Mosby.

Callaway, W. J. (2022). *Mosby's comprehensive review of radiography: The complete study guide and career planner*, (8th Ed. or later Ed.) Mosby.

Carlton, R. R. & Adler, A. M. (2019). *Principles of radiographic imaging: An art and a science*, *(*6th Ed. or later Ed.) Cenage Learning.

Carter, C. & Veale, B. (2022). *Digital Radiography and PACS. (*4th Ed. or later Ed.) Mosby

Dreyer, K. J., Hirschorn, D. S., Thrall, J. H., & Mehta, A. (2005). *PACS: A guide to the digital revolution* (2nd Ed. or later Ed.) Springer

Ehrlich, R. A., & Daly, J. A. (2009). *Patient care in radiography: With an introduction to medical imaging*, *(*7th Ed. or later Ed.) Mosby Elsevier.

Ettinger, A. G. & Burch, P. F. (2007). *Medical terminology: For health careers*, *(*2nd ed. or later Ed.) Paradigm Publishing.

Kelly, L. & Peterson, C. (2018). *Sectional Anatomy for Imaging Professionals, (*4th Ed. or later Ed.) Mosby

Lampignano, J. P. & Bontrager, K. L. (2014). *Textbook of radiographic positioning and related anatomy*, *(*8th Ed. or later Ed.) Mosby Elsevier.

Mace, J. D. & Kowalczyk, N. (2008). *Radiographic pathology for technologists*, *(*5th Ed. or later Ed.) Mosby Elsevier.

Papp, J. (2024). *Quality management in the imaging sciences*, *(*7th Ed. or later Ed.) Mosby.

Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, (15th Ed. or later Ed.) Mosby.

Seeram, E. (2022). *Computed Tomography: Physical Principles, Clinical Applications, and Quality Control, (*5th Ed. or later Ed.) Saunders

Selman, J. (2000). *The fundamentals of imaging physics and radiobiology: For the radiologic technologist*, *(*9th Ed. or later Ed.) Charles C. Thomas Publishing.

Statkiewicz Sherer, M.A., Visconti, P. J., Ritenour, E. R. & Welch-Haynes, K. (2021). *Radiation Protection in Medical Radiography, (*9th Ed. or later Ed.) Mosby

Tortora, G. J., & Derrickson, B. H. (2020). *Principles of anatomy and physiology*, *(*16th Ed. or later Ed.) Wiley.

Williams, P. A. (2022). *Fundamental Concepts and Skills for Nursing, (*6th Ed. or later Ed.) Saunders.

Wilson, B. G. (1997). *Ethics and basic law for medical imaging professionals. (*1st Ed. or later Ed.) F.A. Davis.

Air Force Publications

Air Force Enlisted Classification Directory (AFECD), current release.

AFI 33-332, *Air Force Privacy and Civil Liberties Program*

AFI 44-102, *Medical Care Management*

AFI 41-106, *Medical Readiness Program*

AFI 41-200, *Health Insurance Portability and Accountability Act (HIPAA)*

AFMAN 48-148, *Ionizing Radiation Protection*

AFPD 44-1, *Medical Operations*

DAFMAN 36-2689, *Training Program*

DAFMAN 91-203, *Air Force Occupational Safety Fire and Health Standards*

DAFMAN 48-125, *Personnel Ionizing Radiation Dosimetry*

Picture Archiving and Communication System (PACS) – SEI 264, Section 14:

Carter, C. & Veale, B. (2022). *Digital Radiography and PACS. (*4th Ed. or later Ed.) Mosby

Dreyer, K. J., Hirschorn, D. S., Thrall, J. H., & Mehta, A. (2005). *PACS: A guide to the digital revolution* (2nd Ed. or later Ed.) Springer

Interventional Radiography – SEI 479, Section 15:

Kandarpa, K., Machan L., & Durham, J. D. (2016) *Handbook of Interventional Radiologic procedures, (*5th Ed. or later Ed.) Lippincott, Williams, and Wilkins

Mauro, M.A., Kieran P. J., Thompson, K. R., Venbrux, A. C., & Morgan R. A. (2013). *Image-guided interventions: Expert radiology series, (*2nd Ed. or later Ed.) Saunders

Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, (15th Ed. or later Ed.) Mosby.

STS 4R0X1, Mammography, SEI 460 (for the formal course)

This Block Is For Identification Purposes Only		
Name Of Trainee		
Printed Name (*Last, First, Middle Initial*)	**Initials (Written*)***	**SSAN**
Printed Name Of Certifying Official And Written Initials		
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	

QUALITATIVE REQUIREMENTS

Proficiency Code Key		
	Scale Value	**Definition: The individual**
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (Extremely Limited)
	2	Can do most parts of the task. Needs only help on hardest parts. (Partially Proficient)
	3	Can do all parts of the task. Needs only a spot check of completed work. (Competent)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (Highly Proficient)
*Task Knowledge Levels	a	Can name parts, tools, and simple facts about the task. (Nomenclature)
	b	Can determine step by step procedures for doing the task. (Procedures)
	c	Can identify why and when the task must be done and why each step is needed. (Operating Principles)
	d	Can predict, isolate, and resolve problems about the task. (Advanced Theory)
**Subject Knowledge Levels	A	Can identify basic facts and terms about the subject. (Facts)
	B	Can identify relationship of basic facts and state general principles about the subject. (Principles)
	C	Can analyze facts and principles and draw conclusions about the subject. (Analysis)
	D	Can evaluate conditions and make proper decisions about the subject. (Evaluation)

Explanations

* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Example: b and 1b)

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.

^ This mark is used in column 2 to indicate the task has to be certified when signed off.

- This mark is used alone instead of a scale value to show that no proficiency training is provided in the course or CDC.

X This mark is used alone in the course columns to show that training is required but not given due to limitations in resources.

NOTES:
--All tasks and knowledge items shown with a proficiency code are trained during war time.
--Column 2 Core tasks, when this includes the numbers 5 or 7, this task is a requirement for 5-skill level or 7-skill level upgrade respectively

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)						
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level		D
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC	AZO Mammo Course
1. MAMMOGRAPHY (SEI 460) **TR:** Hologic (2021). *Selenia dimensions: Quality control manual (MAN-03706, Revision 011)*. Danbury, CT: Hologic Inc; Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, 15th Ed. Mosby; U.S. Department of Health and Human Services; Food & Drug Administration (2016), *Mammography Quality Control Manual*													
1.1. Routine mammography													
1.1.1. Obtain craniocaudad (CC) images							-	-	-	-	-	-	**3c**
1.1.2. Obtain mediolateral oblique (MLO) images							-	-	-	-	-	-	**3c**
1.1.3. Breast Anatomy and physiology							-	-	-	-	-	-	**B**
1.1.4. Breast Pathology							-	-	-	-	-	-	**B**
1.1.5. Breast cancer Risk factors							-	-	-	-	-	-	**B**
1.1.6. Benefits of Mammography							-	-	-	-	-	-	**B**
1.1.7. Breast Imaging Reporting and Data System (BI-RADS) tools							-	-	-	-	-	-	**B**
1.1.8. Navigates EHR applications							-	-	-	-	-	-	**2b**
1.2. Additional procedures													
1.2.1. Perform spot compression images							-	-	-	-	-	-	**c**
1.2.2. Perform magnification images							-	-	-	-	-	-	**c**
1.2.3. Perform exaggerated craniocaudad images							-	-	-	-	-	-	**b**
1.2.4. Perform cleavage images							-	-	-	-	-	-	**b**
1.2.5. Perform axillary tail images							-	-	-	-	-	-	**c**
1.2.6. Perform tangential images							-	-	-	-	-	-	**b**
1.2.7. Perform rolled view							-	-	-	-	-	-	**b**
1.2.8. Perform augmented breast (implants) images							-	-	-	-	-	-	**c**
1.2.9. Perform 90-degree lateral images							-	-	-	-	-	-	**b**
1.2.10. Perform lateromedial (LM) images							-	-	-	-	-	-	**b**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)						
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level		D
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC	AZO Mammo Course
1.2.11. Perform lateral medial oblique (LMO) images							-	-	-	-	-	-	**b**
1.2.12. Perform caudocranial (reverse CC) images							-	-	-	-	-	-	**b**
1.2.13. Perform superolateral to inferomedial oblique images							-	-	-	-	-	-	**b**
1.2.14. Perform post-mastectomy images							-	-	-	-	-	-	**b**
1.2.15. Perform Breast Tomosynthesis							-	-	-	-	-	-	**b**
1.2.16. Breast MRI management							-	-	-	-	-	-	**A**
1.2.17. Perform post-procedures imaging							-	-	-	-	-	-	**b**
1.3. Special procedures													
1.3.1. Provide stereotactic biopsy assistance							-	-	-	-	-	-	**a**
1.3.2. Provide needle localization assistance							-	-	-	-	-	-	**a**
1.3.3. Perform aseptic techniques/sterile procedures							-	-	-	-	-	-	**a**
1.3.4. Provide breast sonography assistance							-	-	-	-	-	-	**a**
1.3.5. Provide ductogram assistance							-	-	-	-	-	-	**a**
1.4. Accreditation Standards													
1.4.1. ACR							-	-	-	-	-	-	**B**
1.4.2. MQSA							-	-	-	-	-	-	**B**
1.4.3. Operate Medical Reporting System (MRS)							-	-	-	-	-	-	**2b**
1.5. Perform QC Tests													
1.5.1. Compression Test 2D/3D							-	-	-	-	-	-	**3c**
1.5.2. Phantom test 2D/3D							-	-	-	-	-	-	**3c**
1.5.3. View boxes							-	-	-	-	-	-	**b**
1.5.4. Sensitometry test							-	-	-	-	-	-	**3c**
1.5.5. Detector (flat field) 2D/3D							-	-	-	-	-	-	**3c**
1.5.6. Signal to noise ratio (SNR) 2D/3D							-	-	-	-	-	-	**3c**
1.5.7. Contrast to noise ratio (CNR) 2D/3D							-	-	-	-	-	-	**3c**
1.5.8. Modulation transfer function (MTF)							-	-	-	-	-	-	**b**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)						
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level		D
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Phase I	(2) Phase II	(1) Course	(2) CDC	(1) Course	(2) CDC	AZO Mammo Course
1.5.9. Conduct repeat analysis							-	-	-	-	-	-	**b**
1.5.10. Visual checklist (mammography unit)							-	-	-	-	-	-	**b**
1.5.11. Inspect image receptors							-	-	-	-	-	-	**b**
1.5.12. Test laser film printer							-	-	-	-	-	-	**b**
1.5.13. Clean monitor (Reading/Exam Rooms)							-	-	-	-	-	-	**b**
1.5.20. Gain Calibration 2D/3D							-	-	-	-	-	-	**3c**
1.5.21. Artifact Eval 2D/3D							-	-	-	-	-	-	**3c**
1.5.22. Geometric Calibration 3D							-	-	-	-	-	-	**b**
1.5.18. Image artifacts							-	-	-	-	-	-	**b**
1.5.19. Computer-Aided Detection (CAD)							-	-	-	-	-	-	**b**
1.5.20. Inspect compression paddles							-	-	-	-	-	-	**b**

Training Reference (TR) Source Summary for Mammography, SEI 460

List of commercial and service publications

Note. Most commercial training references are listed in the following format: Author(s), year of publication, title, edition (if applicable), and publisher. Some non-government publications published by organizations are updated quite often, and these may not include edition numbers, year of publication, or an author. Government publications are listed per that department's naming convention. Later or earlier editions of the same publications are acceptable after evaluation.

Mammography:

Hologic (2021). *Selenia dimensions: Quality control manual (MAN-03706, Revision 011)*. Danbury, CT: Hologic Inc.

Rollins, J. H., Long, B. W., Smith, B. J., & Curtis, T. (2022). *Merrill's atlas of radiographic positioning and procedures, 1-3*, (15th Ed. or later Ed.) Mosby.

U.S. Department of Health and Human Services; Food & Drug Administration (2016), *Mammography Quality Control Manual.*

STS for 4R0X1A, Nuclear Medicine

This Block Is For Identification Purposes Only		
Name Of Trainee		
Printed Name (*Last, First, Middle Initial*)	**Initials (Written*)***	**SSAN**
Printed Name Of Certifying Official And Written Initials		
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	

QUALITATIVE REQUIREMENTS

Proficiency Code Key		
	Scale Value	**Definition: The individual**
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (Extremely Limited)
	2	Can do most parts of the task. Needs only help on hardest parts. (Partially Proficient)
	3	Can do all parts of the task. Needs only a spot check of completed work. (Competent)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (Highly Proficient)
*Task Knowledge Levels	a	Can name parts, tools, and simple facts about the task. (Nomenclature)
	b	Can determine step by step procedures for doing the task. (Procedures)
	c	Can identify why and when the task must be done and why each step is needed. (Operating Principles)
	d	Can predict, isolate, and resolve problems about the task. (Advanced Theory)
**Subject Knowledge Levels	A	Can identify basic facts and terms about the subject. (Facts)
	B	Can identify relationship of basic facts and state general principles about the subject. (Principles)
	C	Can analyze facts and principles and draw conclusions about the subject. (Analysis)
	D	Can evaluate conditions and make proper decisions about the subject. (Evaluation)

Explanations

* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Example: b and 1b)

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.

^ This mark is used in column 2 to indicate the task has to be certified when signed off.

- This mark is used alone instead of a scale value to show that no proficiency training is provided in the course or CDC.

X This mark is used alone in the course columns to show that training is required but not given due to limitations in resources.

NOTES:
--All tasks and knowledge items shown with a proficiency code are trained during war time.
--Column 2 Core tasks, when this includes the numbers 5 or 7, this task is a requirement for 5-skill level or 7-skill level upgrade respectively

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
1. NUCLEAR MEDICINE (A-shred)												
1.1. Bone scan imaging												
1.1.1. Obtain three phase images	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
1.1.2. Obtain whole body planar images	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
2. ENDOCRINE IMAGING												
2.1. Obtain thyroid images	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
2.2. Assess thyroid uptake	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
2.3. Obtain metastatic thyroid images							**b**	**2b**	**-**	**-**	**-**	**-**
2.4. Obtain parathyroid images							**b**	**2b**	**-**	**-**	**-**	**-**
2.5. Obtain adrenal images							**b**	**1b**	**-**	**-**	**-**	**-**
3. CENTRAL NERVOUS SYSTEM IMAGING												
3.1. Obtain planar brain scan images							**a**	**1a**	**-**	**-**	**-**	**-**
3.2. Obtain brain flow images							**a**	**1a**	**-**	**-**	**-**	**-**
3.3. Obtain brain death images							**a**	**1a**	**-**	**-**	**-**	**-**
3.4. Evaluate shunts							**a**	**1a**	**-**	**-**	**-**	**-**
3.5. Obtain cerebral spinal fluid (CSF) cisternography images							**a**	**1a**	**-**	**-**	**-**	**-**
4. PULMONARY IMAGING												
4.1. Obtain perfusion images	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
4.2. Obtain ventilation or Aerosol images	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
4.3. Obtain quantitative (split lung) images							**b**	**3c**	**-**	**-**	**-**	**-**
5. GASTROINTESTINAL AND HEPATOBILIARY IMAGING												
5.1. Obtain liver images	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
5.2. Obtain spleen images							**b**	**3c**	**-**	**-**	**-**	**-**
5.3. Assess hepatobiliary function (ejection fraction: EF)	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
5.4. Gastroesophageal imaging												
5.4.1. Assess gastric emptying	**5**						**b**	**3c**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
5.4.2. Evaluate esophageal transit							a	b	-	-	-	-
5.4.3. Evaluate gastroesophageal reflux							a	b	-	-	-	-
5.4.4. Obtain GI bleed images	5						b	3c	-	-	-	-
5.4.5. Detect Meckel's diverticulum							a	2b	-	-	-	-
6. TUMOR AND INFECTION IMAGING												
6.1. Obtain Gallium-67 images	5						a	3c	-	-	-	-
6.2. Obtain Iodine-131 MIBG images	5						a	3c	-	-	-	-
6.3. Obtain Indium-111 Monoclonal antibodies; white blood cells (MABS) images							a	3c	-	-	-	-
6.4. Obtain Indium-111 WBC images	5						a	3c	-	-	-	-
6.5. Obtain breast images							a	1a	-	-	-	-
6.6. Obtain lymphoscintigraphic images							a	2b	-	-	-	-
6.7. Obtain sentinel node images							a	3b	-	-	-	-
7. RENAL AND GENITOURINARY IMAGING												
7.1. Obtain Renal imaging	5						a	3c	-	-	-	-
7.2. Assess renogram	5						b	3c	-	-	-	-
7.3. Compute glomerular filtration rate	5						b	3c	-	-	-	-
7.4. Compute effective renal plasma flow rate	5						b	3c	-	-	-	-
7.5. Obtain diuretic interventional renographic images							b	3c	-	-	-	-
7.6. Obtain ACE-inhibitor interventional renographic images							b	1b	-	-	-	-
7.7. Obtain dynamic perfusion images	5						b	3c	-	-	-	
7.8. Evaluate transplant function							a	2b	-	-	-	-
7.9. Obtain renal cortical images	5						b	3c	-	-	-	-
7.10. Obtain voiding cystourethrogram images							a	1b	-	-	-	-
7.11. Obtain testicular images							a	-	-	-	-	-
8. PLANAR CARDIAC IMAGING												
8.1. Obtain myocardial perfusion images	5						b	3c	-	-	-	-

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		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
8.2. Obtain infarct avid images	5						a	3c	-	-	-	-
8.3. Gated blood pool imaging												
8.3.1. Acquire resting multiple gated images	5						b	3c	-	-	-	-
8.3.2. Acquire stress multiple gated images	5						a	3c	-	-	-	-
8.3.3. Compute ejection fraction	5						b	3c	-	-	-	-
8.4. Radionuclide ventriculography												
8.4.1. Explain first-pass study							a	b	-	-	-	-
8.4.2. Detect left-to-right shunting							a	b	-	-	-	-
8.4.3. Detect right-to-left shunting							a	b	-	-	-	-
9. SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY (SPECT) PROCEDURES												
9.1. Obtain cardiac images	5						b	3c	-	-	-	-
9.2. Obtain gated myocardial perfusion images	5						b	3c	-	-	-	-
9.3. Administer pharmacologic cardiac stress test	5						b	3c	-	-	-	-
9.4. Obtain bone images	5						b	3c	-	-	-	-
9.5. Obtain abdomen images							a	2b	-	-	-	-
9.6. Obtain thoracic images							a	2b	-	-	-	-
9.7. Obtain brain images							a	2b	-	-	-	-
9.8. Obtain liver and spleen images							a	2b	-	-	-	-
10. OTHER IMAGING METHODS												
10.1. Obtain positron emission tomography (PET) images	5						a	2b	-	-	-	-
10.2. Obtain PET/CT images	5						a	2b	-	-	-	-
10.3. Obtain SPECT/CT images	5						a	-	-	-	-	-
10.4. Obtain MRI fusion images							a	-	-	-	-	-
11. NON-IMAGING NUCLEAR LABORATORY PROCEDURES												
11.1. Conduct Schilling's test							a	-	-	-	-	-

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		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
11.2. Perform therapy procedures												
11.2.1. Administer Phosphorus-32 therapy							**a**	**-**	**-**	**-**	**-**	**-**
11.2.2. Administer Strontium-89 palliative therapy							**a**	**-**	**-**	**-**	**-**	**-**
11.2.3. Administer Yttrium-90 therapy								**-**	**-**	**-**	**-**	**-**
11.2.4. Administer Lutathara (Lutetium-177) therapy								**-**	**-**	**-**	**-**	**-**
11.2.5. Administer Iodine-131 hypothyroidism therapy												
11.2.5.1. Instruct patients							**b**	**3c**	**-**	**-**	**-**	**-**
11.2.5.2. Instruct staff							**b**	**3c**	**-**	**-**	**-**	**-**
11.2.6. Administer Iodine 131 ablative therapy												
11.2.6.1. Prepare room							**a**	**2b**	**-**	**-**	**-**	**-**
11.2.6.2. Instruct patients							**a**	**2b**	**-**	**-**	**-**	**-**
11.2.6.3 Instruct staff							**a**	**2b**	**-**	**-**	**-**	**-**
11.2.6.4 Assess patient release levels							**a**	**2b**	**-**	**-**	**-**	**-**
11.2.6.5 Decontaminate room							**a**	**2b**	**-**	**-**	**-**	**-**
11.3 Radiopharmacy procedures TR: Fundamentals of Nuclear												
11.3.1 Apply radiopharmaceutical safety techniques	**5**						**2b**	**3c**	**-**	**-**	**-**	**-**
11.3.2 Radionuclide generator												
11.3.2.1 Operate radionuclide generator							**2b**	**3c**	**-**	**-**	**-**	**-**
11.3.2.2 Shield radionuclide generator							**2b**	**3c**	**-**	**-**	**-**	**-**
11.3.2.3 Apply elution technique							**2b**	**3c**	**-**	**-**	**-**	**-**
11.3.2.4 Extract radiation from wet-dry column							**2b**	**3c**	**-**	**-**	**-**	**-**
11.3.2.5 Conduct molybdenum assay							**2b**	**3c**	**-**	**-**	**-**	**-**
11.3.2.6 Conduct aluminum ion testing							**2b**	**3c**	**-**	**-**	**-**	**-**
11.3.3 Prepare radiopharmaceutical kit												
11.3.3.1 Apply aseptic technique	**5**						**b**	**3c**	**-**	**-**	**-**	**-**

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		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
11.3.3.2 Maintain quality control	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.4 Operate dose calibrator	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.5 Radiopharmaceutical handling												
11.3.5.1 Handle radiopharmaceuticals	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.5.2 Radioactive receipt methods												
11.3.5.2.1 Inspect package	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.5.2.2 Monitor package	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.5.2.3 Maintain receipt logs	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.6 Radiopharmaceutical storage and disposal												
11.3.6.1 Monitor decay in storage	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.6.2 Package radiopharmaceuticals	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.6.3 Survey disposed radiopharmaceuticals	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.6.4 Dispose radiopharmaceuticals	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.6.5 Transfer radiopharmaceuticals							**b**	**2b**	**-**	**-**	**-**	**-**
11.3.7 Radiopharmaceutical safety												
11.3.7.1 Operate survey instruments	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.7.2 Conduct swipe test analysis	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.7.3 Use syringe shields	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.7.4 Label radiopharmaceuticals	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.8 Inject radiopharmaceuticals	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.9 Blood cell labeling techniques												
11.3.9.1 Prepare in vivo labeling							**a**	**2b**	**-**	**-**	**-**	**-**
11.3.9.2 Prepare modified in vitro labeling							**a**	**1b**	**-**	**-**	**-**	**-**
11.3.9.3 Prepare in vitro labeling	**5**						**a**	**3c**	**-**	**-**	**-**	**-**
11.3.10 Compute staff bioassay	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
11.3.11 Dose calculations												
11.3.11.1 Calculate radiopharmaceutical dose	**5**						**2b**	**3c**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
11.3.11.2 Calculate pharmaceutical dose	**5**						**2b**	**3c**	**-**	**-**	**-**	**-**
12 NUCLEAR MEDICINE SAFETY												
12.1 Prepare a personnel dosimetry program							**a**	**-**	**-**	**-**	**-**	**-**
12.2 Secure lab	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
12.2.1 Renew material license							**a**					
12.2.2 Amend material license							**a**					
12.2.3 Renew material permit							**a**					
12.2.4 Amend material permit							**a**					
12.3 Determine radioactive material shielding requirements							**2b**	**3c**	**-**	**-**	**-**	**-**
12.4 Prepare radiation accident protocol							**b**	**1b**	**-**	**-**	**-**	**-**
12.5 Prepare misadministration protocol							**b**	**1b**	**-**	**-**	**-**	**-**
12.6 Post Nuclear Regulatory Commission (NRC) notices							**b**	**1b**	**-**	**-**	**-**	**-**
12.7 NRC compliance												
12.7.1 Code of Federal Regulations (CFR) Title 10, Part 19							**B**	**-**	**-**	**-**	**-**	**-**
12.7.2 CFR Title 10, Part 20							**B**	**-**	**-**	**-**	**-**	**-**
12.7.3 CFR Title 10, Part 35							**B**	**-**	**-**	**-**	**-**	**-**
12.8 Area survey procedures												
12.8.1 Conduct weekly swipe test	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
12.8.2 Conduct daily contamination survey	**5**						**b**	**3c**	**-**	**-**	**-**	**-**
13. UPTAKE PROBE QUALITY CONTROL												
13.1. Calibrate uptake probe							**2b**	**3b**	**-**	**-**	**-**	**-**
13.2. Determine sensitivity							**2b**	**3b**	**-**	**-**	**-**	**-**
13.3. Determine crystal resolution							**2b**	**3b**	**-**	**-**	**-**	**-**
13.4. Compute chi-square results							**2b**	**3b**	**-**	**-**	**-**	**-**
13.5. Assess linearity							**2b**	**3b**	**-**	**-**	**-**	**-**
13.6. Gamma camera quality control												
13.6.1 Acquire intrinsic field data	**5**						**b**	**3c**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
13.6.2. Acquire extrinsic field data	5						1a	3c	-	-	-	-
13.7. Field artifacts	5						A	-	-	-	-	-
13.7.1. Determine sensitivity	5						1a	3c	-	-	-	-
13.7.2. Determine uniformity	5						1a	3c	-	-	-	-
13.7.3. Determine system resolution							a	3c	-	-	-	-
13.7.4. Detector												
13.7.4.1. Calibrate energy							a	3c	-	-	-	-
13.7.4.2. Calibrate linearity							a	3c	-	-	-	-
13.7.4.3. Calibrate isotope peak (multiple window)	5						a	3c	-	-	-	-
13.8. SPECT/CT*												
13.8.1. Assess center of rotation	5						a	3c	-	-	-	-
13.8.2. Determine resolution							a	3c	-	-	-	-
13.8.3. Determine sensitivity								-	-	-	-	-
13.9. Dose calibrator												
13.9.1. Assess constancy	5						b	3c	-	-	-	-
13.9.2. Assess accuracy	5						b	3c	-	-	-	-
13.9.3. Assess geometry	5						b	3c	-	-	-	-
13.9.4. Assess linearity	5						b	3c	-	-	-	-
14. Nuclear medicine computer applications												
14.1. Acquire static images	5						a	3c	-	-	-	-
14.2. Acquire dynamic images	5						a	3c	-	-	-	-
14.3. Acquire gated images	5						a	3c	-	-	-	-
14.4. Acquire SPECT images	5						a	3c	-	-	-	-
14.5. Acquire SPECT gated images	5						a	3c	-	-	-	-
14.6. Image processing												
14.6.1. Format image	5						a	3c	-	-	-	-
14.6.2. Obtain filter parameters	5						a	3c	-	-	-	-

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		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
4.6.3. Measure region of interest	5						a	3c	-	-	-	-
14.6.4. Reconstruct SPECT/CT image	5						a	3c	-	-	-	-
14.6.5. Correct attenuation	5						a	3c	-	-	-	-
15. Nuclear medicine patient care TR: Patient Care in Radiography												
15.1. Patient safety							A	B	-	-	-	-
15.2. Monitor vital signs	5						2b	3c	-	-	-	-
15.3. Demonstrate lifting techniques	5						b	2b	-	-	-	-
15.4. Perform venipuncture	5						2b	3c	-	-	-	-
15.5. Employ IV precautions	5						2b	3c	-	-	-	-
15.6. Monitor patients							b	c	-	-	-	-
16. Operate patient emergency equipment (crash cart)							b	2b	-	-	-	-
17. Medication administration												
17.1. Administer oral medications: Captopril (e.g., Capoten)							a	-	-	-	-	-
17.2. Administer intramuscular medications: B-12							a	-	-	-	-	-
17.3 Intravenous medications												
17.3.1. Administer adenosine							b	3c	-	-	-	-
17.3.2. Administer furosemide (e.g., Lasix)	5						b	3c	-	-	-	-
17.3.3. Administer dobutamine							b	3c	-	-	-	-
17.3.4. Administer aminophylline	5						b	3c	-	-	-	-
17.3.5. Administer thyrogen							b	3c	-	-	-	-
17.3.6. Administer cholecystokinin (e.g., CCK)	5						b	3c	-	-	-	-
17.3.7. Administer enalapril maleate (e.g., Vasotec)							a	-	-	-	-	-
17.3.8. Administer regadenoson (e.g. Lexiscan)	5						b	3c	-	-	-	-
17.3.9. Document medication administration	5						b	3c	-	-	-	-
18. Applied Technical Mathematics												

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		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
18.1. Solve algebraic equations							**2b**	**3b**	-	-	-	-
18.2. Solve mathematical problems using radicals/exponents							**2b**	**3b**	-	-	-	-
18.3. Solve mathematical problems using logarithms							**2b**	**3b**	-	-	-	-
18.4. Construct a linear and exponential graph to determine the physical half-life of a radionuclide							**2b**	**3b**	-	-	-	-
18.5. Utilize decay formula							**2b**	**3b**	-	-	-	-
18.6. Calculate/Process statistical data from imaging procedures							**2b**	**3b**	-	-	-	-
19. Applied Nuclear Physics												
19.1. Solve mass-energy conversions							**2b**	**3b**	-	-	-	-
19.2. Utilize decay formula							**2b**	**3b**	-	-	-	-
19.3. Solve for the decay scheme for any radionuclide to stability							**2b**	**3b**	-	-	-	-
19.4. Calculate the energy values for given particulate and electromagnetic radiation							**2b**	**3b**	-	-	-	-
20. Applied Technical Chemistry												
20.1. Solve conversions among basic systems of measurement							**2b**	**3b**	-	-	-	-
20.2. Configure the electron configuration of elements reflecting the change in valence states							-	-	-	-	-	-
20.3. Solve conversions among molecules, atoms, or grams of a substance							-	-	-	-	-	-
20.4. Formulate inorganic compounds and their chemical formulas							-	-	-	-	-	-

Training Reference (TR) Source Summary for STS 4R0X1A, Nuclear Medicine
List of commercial and service publications

Note. Most commercial training references are listed in the following format: Author(s), year of publication, title, edition (if applicable), and publisher. Some non-government publications published by organizations are updated quite often, and these may not include edition numbers, year of publication, or an author. Government publications are listed per that department's naming convention. Later or earlier editions of the same publications are acceptable after evaluation.

The following publications apply to all sections of this STS table for 4R0X1A:

Bureau of Radiological Health and the Training Institute Environmental Control Administration. (1970). *Radiological Health Handbook.* Rockville, Maryland: US Department of Health, Education and Welfare.

Bushong, S. C. (2019). *Radiologic science for technologists: Physics, biology, and protection*, (12th Ed. or later Ed.) Mosby.

Cherry, S. R., Sorenson, J. A., & Phelps, M. E. (2012). *Physics in nuclear medicine (*4th Ed. or later Ed.) Saunders.

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Ewen, D., Gary, J. S. & Trefzger, J. E. (2005). *Technical mathematics, (*2nd Ed. or later Ed.) Pearson Prentice Hall.

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Statkiewicz Sherer, M. A., Visconti, P. J., Ritenour, E. R., Haynes, K. W. (2021). *Radiation protection in medical radiography, (*4th Ed. or later Ed.) Mosby

Tortora, G. J., & Derrickson, B. H. (2020). *Principles of anatomy and physiology*, *(*16th Ed. or later Ed.) Wiley.

Watson, S., Warner, G., Snyder, W., & Ford, M. (1975). *MIRD Pamphlet No.11, (*11th Ed. or later Ed.) Society of Nuclear Medicine.

STS for 4R0X1B, Diagnostic Medical Sonography

This Block Is For Identification Purposes Only		
Name Of Trainee		
Printed Name (*Last, First, Middle Initial*)	**Initials (Written*)***	**SSAN**
Printed Name Of Certifying Official And Written Initials		
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	

QUALITATIVE REQUIREMENTS

Proficiency Code Key		
	Scale Value	**Definition: The individual**
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (Extremely Limited)
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	3	Can do all parts of the task. Needs only a spot check of completed work. (Competent)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (Highly Proficient)
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	b	Can determine step by step procedures for doing the task. (Procedures)
	c	Can identify why and when the task must be done and why each step is needed. (Operating Principles)
	d	Can predict, isolate, and resolve problems about the task. (Advanced Theory)
**Subject Knowledge Levels	A	Can identify basic facts and terms about the subject. (Facts)
	B	Can identify relationship of basic facts and state general principles about the subject. (Principles)
	C	Can analyze facts and principles and draw conclusions about the subject. (Analysis)
	D	Can evaluate conditions and make proper decisions about the subject. (Evaluation)

Explanations

* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Example: b and 1b)

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.

^ This mark is used in column 2 to indicate the task has to be certified when signed off.

- This mark is used alone instead of a scale value to show that no proficiency training is provided in the course or CDC.

X This mark is used alone in the course columns to show that training is required but not given due to limitations in resources.

NOTES:
--All tasks and knowledge items shown with a proficiency code are trained during war time.
--Column 2 Core tasks, when this includes the numbers 5 or 7, this task is a requirement for 5-skill level or 7-skill level upgrade respectively

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
1. DIAGNOSTIC MEDICAL SONOGRAPHY (B-shred)												
1.1. Principles of diagnostic ultrasound												
1.1.1. Practical physics							B	-	-	-	-	-
1.1.2. Instrumentation							B	-	-	-	-	-
1.1.3. Artifacts							B	-	-	-	-	-
1.1.4. Safety							B	-	-	-	-	-
1.1.5. Doppler physics							B	-	-	-	-	-
1.1.6. Vascular physics							B	-	-	-	-	-
1.1.7. 3D/4D Physics							A	-	-	-	-	-
1.1.8. Ethics							B	-	-	-	-	-
2. BASIC OPERATING PROCEDURES												
2.1. Adjust sonographic instrumentation	5						2b	3c	-	-	-	-
2.2. Adjust image display	5						2b	3c	-	-	-	-
2.3. Record ultrasound image	5						2b	3c	-	-	-	-
2.4. Prep patient	5						2b	3c	-	-	-	-
2.5. Apply ergonomics							2b	3c	-	-	-	-
2.6. Perform 3D/4D Imaging							a	b	-	-	-	-
2.7. Conduct equipment quality control							a	-	-	-	-	-
2.8. Employ transducer cleaning techniques	5						b	3c	-	-	-	-
2.9. Interact with Patient							2b	3c	-	-	-	-
2.10. Interact with radiologist							a	3b	-	-	-	-
3. SONOGRAPHIC ANATOMY AND PHYSIOLOGY												
3.1. Abdomen							B	-	-	-	-	-
3.2. Pelvis							B	-	-	-	-	-
3.3. Extremities							A	-	-	-	-	-
3.4. Testicular							B	-	-	-	-	-
3.5. Breast							B	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
3.6. Thyroid							B	-	-	-	-	-
3.7. Vascular							A	-	-	-	-	-
3.8. Obstetrics							B	-	-	-	-	-
4. PEDIATRIC												
4.1. Neonatal brain							-	a	-	-	-	-
4.2. Spine							-	-	-	-	-	-
4.3. Hips							-	-	-	-	-	-
5. SONOGRAPHY IMAGING												
5.1. Obtain aorta images	5						2b	3c	-	-	-	-
5.2. Obtain liver images	5						2b	3c	-	-	-	-
5.3. Obtain gallbladder and biliary images	5						2b	3c	-	-	-	-
5.4. Obtain pancreas images	5						2b	3c	-	-	-	-
5.5. Obtain urinary system images	5						2b	3c	-	-	-	-
5.6. Obtain spleen images	5						2b	3c	-	-	-	-
5.7. Obtain abdominal Doppler data							a	2b	-	-	-	-
5.8. Obtain gastrointestinal (GI) tract images							a	-	-	-	-	-
6. PELVIS												
6.1. Obtain transabdominal images	5						2b	3c	-	-	-	-
6.2. Obtain endovaginal images	5						1b	3c	-	-	-	-
7. OBSTETRICAL												
7.1. Obtain first trimester images	5						2a	2b	-	-	-	-
7.2. Obtain second and third trimester images							1a	2b	-	-	-	-
8. PERIPHERAL VASCULAR												
8.1. Obtain upper extremity vascular images	5						1b	2c	-	-	-	-
8.2. Obtain lower extremity vascular images	5						1b	2c	-	-	-	-
8.3. Obtain carotid artery images							1b	2c	-	-	-	-
8.4. Obtain thyroid images	5						2b	3c	-	-	-	-
8.5. Obtain testicular images	5						1b	3c	-	-	-	-

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8.6. Obtain breast images							1b	2b	-	-	-	-
8.7. Obtain superficial images							a	b	-	-	-	-
8.8. Obtain musculoskeletal images (MSK)							a	b	-	-	-	-
9. TRANSPLANT												
9.1. Obtain Renal transplant images							a	-	-	-	-	-
9.2. Obtain liver transplant images							a	-	-	-	-	-
9.3. Provide invasive procedure assistance							a	-	-	-	-	-
10. PEDIATRICS												
10.1. Obtain neonatal head images							a	-	-	-	-	-
10.2. Obtain neonatal spine images							-	-	-	-	-	-
10.3. Obtain neonatal hips							-	-	-	-	-	-
11. PATHOLOGY												
11.1. Abdomen							B	-	-	-	-	-
11.2. Pelvis							B	-	-	-	-	-
11.3. Extremities							B	-	-	-	-	-
11.4. Testicular							B	-	-	-	-	-
11.5. Breast							B	-	-	-	-	-
11.6. Thyroid							B	-	-	-	-	-
11.7. Vascular							B	-	-	-	-	-
11.8. Obstetrics							B	-	-	-	-	-
11.9. Neonatal head							A	-	-	-	-	-
11.10. Musculoskeletal							A	-	-	-	-	-
11.11. Superficial Structures							A	-	-	-	-	-

Training Reference (TR) Source Summary for STS 4R0X1B, Diagnostic Med Sonography
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Curry, R. A. & Tempkin, B. B. (2015) *Sonography: An introduction to normal structure and function, (*4th Ed. or later Ed.) Saunders.

Edelman, S. K. (2012). *Understanding ultrasound physics*, (4th Ed. or later Ed.) E.S.P. Ultrasound

Hagen-Ansert, S.L. (2012). *Textbook of diagnostic sonography: 2-volume set, (*8th Ed. or later Ed.) Mosby

STS 4R0X1C, Magnetic Resonance Imaging

This Block Is For Identification Purposes Only		
Name Of Trainee		
Printed Name (*Last, First, Middle Initial*)	**Initials (Written*)***	**SSAN**
Printed Name Of Certifying Official And Written Initials		
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	
N/I	*N/I*	

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		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
1. MAGNETIC RESONANCE IMAGING (C-shred)												
1.1. Safety in the magnetic resonance (MR) environment												
1.1.1. Contraindications for scanning							**C**	-	-	-	-	-
1.1.2. Projectile Dangers							**C**	-	-	-	-	-
1.1.3. Perform magnet quench							**c**	-	-	-	-	-
1.1.4. Perform Emergency evacuation procedures	**5**						**3c**	-	-	-	-	-
1.1.5. RF Irradiation							**C**	-	-	-	-	-
1.1.6. MRI Zones							**C**	-	-	-	-	-
1.1.7. Assess patients for MRI safety contraindications	**5**						**3c**	-	-	-	-	-
2. PHYSICS OF MAGNETIC RESONANCE												
2.1. Flip angles							**B**	-	-	-	-	-
2.2. Time of inversion							**B**	-	-	-	-	-
2.3. Matrices							**B**	-	-	-	-	-
2.4. Signal averages							**B**	-	-	-	-	-
2.5. Bandwidth							**B**	-	-	-	-	-
2.6. Magnetism							**B**	-	-	-	-	-
2.7. Free Induction Decay							**B**	-	-	-	-	-
2.8. Resonance							**B**	-	-	-	-	-
3. IMAGE WEIGHTING AND CONTRAST												
3.1. Resolution							**B**	-	-	-	-	-
3.2. T1 weighting							**B**	-	-	-	-	-
3.3. T2 weighting							**B**	-	-	-	-	-
3.4. Proton density weighting							**B**	-	-	-	-	-
4. MR PULSE SEQUENCES												
4.1. Spin echo							**B**	-	-	-	-	-
4.2. Gradient echo							**B**	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
4.3. Fast Spin Echo							**B**	-	-	-	-	-
4.4. Echo Planer Imaging							**B**	-	-	-	-	-
4.5. Inversion Recovery							**B**	-	-	-	-	-
4.6. Diffusion Imaging							**B**	-	-	-	-	-
4.7. Spectroscopy							**B**	-	-	-	-	-
4.8. Cine							**B**	-	-	-	-	-
5. ADJUSTS IMAGING PARAMETERS												
5.1. Phase/Frequency direction	**5**						**2b**	-	-	-	-	-
5.2. Echo Train Length	**5**						**2b**	-	-	-	-	-
5.3. Time of Repetition	**5**						**2b**	-	-	-	-	-
5.4. Time of Echo	**5**						**2b**	-	-	-	-	-
5.5. Field of View	**5**						**2b**	-	-	-	-	-
5.6. Phase Field of View	**5**						**2b**	-	-	-	-	-
5.10. Flow Compensation							**a**	-	-	-	-	-
5.11. Respiratory Compensation							**a**	-	-	-	-	-
5.12. Parallel Imaging							**a**	-	-	-	-	-
5.13. Cardiac gating							**a**	-	-	-	-	-
5.14. Respiratory gating							**a**	-	-	-	-	-
6. MR ANGIOGRAPHY												
6.1. Perform Time of flight	**5**						**2b**	-	-	-	-	-
6.2. Phase contrast							**B**	-	-	-	-	-
7. MR SYSTEM COMPONENTS												
7.1. Magnet							**B**	-	-	-	-	-
7.2. Operator's console							**B**	-	-	-	-	-
7.5. Quench box							**B**	-	-	-	-	-
7.8. Cryogen monitors							**B**	-	-	-	-	-
7.9. Coils							**B**	-	-	-	-	-

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
8. SECTIONAL ANATOMY												
8.1. Brain							**B**	**-**	**-**	**-**	**-**	**-**
8.2. Neck							**B**	**-**	**-**	**-**	**-**	**-**
8.3. Spine							**B**	**-**	**-**	**-**	**-**	**-**
8.4. Thorax							**B**	**-**	**-**	**-**	**-**	**-**
8.5. Heart							**B**	**-**	**-**	**-**	**-**	**-**
8.6. Abdomen							**B**	**-**	**-**	**-**	**-**	**-**
8.7. Pelvis							**B**	**-**	**-**	**-**	**-**	**-**
8.8. Extremities							**B**	**-**	**-**	**-**	**-**	**-**
9. MR CONTRAST AGENTS & ADMINISTRATION												
9.1. Types of agents							**B**	**-**	**-**	**-**	**-**	**-**
9.2. Contraindications to contrast							**B**	**-**	**-**	**-**	**-**	**-**
9.3. Perform intravenous (IV) access for contrast media	**5**						**2b**	**-**	**-**	**-**	**-**	**-**
9.4. Perform power injections of contrast media	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
9.5. Perform hand injections of contrast media	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
10. Operate MRI system												
10.1. Start-up	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
10.2. Shutdown	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
10.3. Emergency shutdown	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
10.4. Tuning the magnet							**-**	**-**	**-**	**-**	**-**	**-**
11. Prepare of examination												
11.1. Patient Prep	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
11.2. Room Prep	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
12. Perform examinations												
12.1. Obtain brain images	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
12.2. Obtain internal auditory canal images							**2b**	**-**	**-**	**-**	**-**	**-**
12.3. Obtain pituitary gland images							**2b**	**-**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
		A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
12.4. Obtain orbits images							**2b**	**-**	**-**	**-**	**-**	**-**
12.5. Obtain cranial nerve images							**1a**	**-**	**-**	**-**	**-**	**-**
12.6. Obtain C-spine images	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
12.7. Obtain T-spine images	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
12.8. Obtain L-spine	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
12.9. Obtain anterior neck images							**-**	**-**	**-**	**-**	**-**	**-**
12.10. Obtain shoulder images	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
12.11. Obtain elbow images							**2b**	**-**	**-**	**-**	**-**	**-**
12.12. Obtain wrist images							**2b**	**-**	**-**	**-**	**-**	**-**
12.13. Obtain hand/finger images							**2b**	**-**	**-**	**-**	**-**	**-**
12.14. Obtain knee images	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
12.15. Obtain pelvis/hip images							**2b**	**-**	**-**	**-**	**-**	**-**
12.16. Obtain ankle images							**2b**	**-**	**-**	**-**	**-**	**-**
12.17. Obtain foot/toe images							**2b**	**-**	**-**	**-**	**-**	**-**
12.18. Obtain long bone (e.g., tib/fib, femur, forearm) images	**5**						**3c**	**-**	**-**	**-**	**-**	**-**
12.19. Obtain temporomandibular joint images							**2b**	**-**	**-**	**-**	**-**	**-**
12.20. Obtain heart images							**2b**	**-**	**-**	**-**	**-**	**-**
12.21. Obtain great vessel images							**1a**	**-**	**-**	**-**	**-**	**-**
12.22. Obtain abdomen images							**2b**	**-**	**-**	**-**	**-**	**-**
12.23. Obtain MR mammography images							**-**	**-**	**-**	**-**	**-**	**-**
12.24. Perform Quality Control							**2b**	**-**	**-**	**-**	**-**	**-**
12.25. Perform quality assurance on MRI systems							**1a**	**-**	**-**	**-**	**-**	**-**
13. MR Artifacts TR: MRI in Practice												
13.1. Flow							**B**	**-**	**-**	**-**	**-**	**-**
13.2. Phase Mis-mapping							**B**	**-**	**-**	**-**	**-**	**-**
13.3. Aliasing/Wrap Around							**B**	**-**	**-**	**-**	**-**	**-**
13.4. Chemical Shift							**B**	**-**	**-**	**-**	**-**	**-**

1. Tasks, Knowledge and Technical References	2. Core Tasks	3. Certification For OJT					4. Proficiency Codes Used To Indicate Training/Information Provided (See Note)					
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		Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certifier Initials	(1) Course	(2) CDC	(1) Course	(2) CDC	(1) Course	(2) CDC
13.5. Chemical Mis-registration							**B**	-	-	-	-	-
13.6. Truncation							**B**	-	-	-	-	-
13.7. Magnetic Susceptibility							**B**	-	-	-	-	-
13.8. Cross-Talk							**B**	-	-	-	-	-
13.9. Zipper							**B**	-	-	-	-	-
13.10. Shading							**B**	-	-	-	-	-
13.11. Moire							**B**	-	-	-	-	-
13.12. Magic Angle							**B**	-	-	-	-	-

Training Reference (TR) Source Summary for STS 4R0X1C, Magnetic Resonance Imaging

List of commercial and service publications

Note. Most commercial training references are listed in the following format: Author(s), year of publication, title, edition (if applicable), and publisher. Some non-government publications published by organizations are updated quite often, and these may not include edition numbers, year of publication, or an author. Government publications are listed per that department's naming convention. Later or earlier editions of the same publications are acceptable after evaluation.

The following publications apply to all sections of this STS table for 4R0X1C:

Kelley, L. & Petersen, C.M. (2013). *Sectional Anatomy for Imaging Professionals* (3rd ed. or later ed.). Mosby

Elsevier. Westbrook, C., Talbot, J., & Roth, C. K. (2011). *MRI in Practice* (4th ed. or later ed.). Malden, Massachusetts: Wiley-Blackwell.

Section B – Course Objective List (COL)

1. Course Objectives for Initial Skills Course. To obtain a copy of a COL, contact:

Training Development Element
382 TRS/TRR
2931 Harney Path
San Antonio, TX 78234
Phone: DSN 420-5321 or Commercial: (210) 808-5321

2. Each proficiency coded task or knowledge item taught at the technical school is measured using an objective. An objective is a written instruction for the students, so they know what is expected of them to successfully complete training on each task or knowledge item. Each objective is composed of a condition, behavior, and a standard. The condition is the setting in which the training takes place (type of equipment or references when required). The behavior is the observable portion of the objective (perform hand washing). The standard is the level of performance that is measured to ensure the proficiency code level is maintained (e.g., to a 70% or with no instructor assists). All objectives use a progress check (PC), written test (W) or a (-) combination of both to measure a student's ability (skill) or knowledge.

3. Standard. The minimum standard for written examinations is 70% (A higher standard may be approved by the AETC Training Manager). Standards for performance measurement are indicated in the objective and delineated on the individual progress checklist. Instructor assistance is provided as needed during the progress check and students may be required to repeat all or part of the behavior until satisfactory performance is attained.

4. Proficiency Level. Behavior statements are taught at the analysis, evaluation, and application levels. Prerequisites for course attendance support or augment training provided in the Diagnostic Imaging course.

Section C – Support Materials

There are no support materials requirements for this CFETP. This area is reserved.

Section D – Training Course Index

1. Purpose. This section identifies training courses available for the specialty.

1.1. Air Force In-Residence Courses.

COURSE NUMBER	TITLE	DURATION	LOCATION
L5AQJ4R031 01AB	Diagnostic Imaging Phase I	97 Days	METC – Ft Sam Houston, TX
L5ABO4R031 02AC	Diagnostic Imaging Phase II	165 days	Various Locations
L5ALJ4R031A01AA	Nuclear Medicine Phase I	97 Days	METC – Ft Sam Houston, TX
L5ABO4R031A02AA	Nuclear Medicine Phase II	161 Days	Various Locations
L5AQJ4R031B01AA	Diagnostic Medical Sonography Phase I	54 Days	METC – Ft Sam Houston, TX
L5ALO4R031B02AB	Diagnostic Medical Sonography Phase II	80 Days	Various Locations
L5AZO4R051 00AB	Diagnostic Imaging Mammography	10 days	JBSA-Lackland AFB, TX
L5ALO4R031C00AA	Magnetic Resonance Imaging	50 Days	JBSA-Lackland AFB, TX

1.2. Air Force Career Development Academy (AFCDA) Courses. There are no career

development courses for this AFSC.

Section E – MAJCOM-Unique Requirements

There are currently no MAJCOM unique requirements. This area is reserved.

Section F – Documentation of Training

1. Work Center Training Plans. The purpose of this section is to provide guidelines to document the training of enlisted medical personnel. Training documentation helps to assess readiness capability as well as individual strengths and weaknesses. It also aids compliance with all The Joint Commission, Accreditation Association for Ambulatory Health Care, and Health Services Inspections, and other regulatory requirements as applicable. Many work centers have a Master Task Listing (MTL)--a list containing all the tasks that are to be trained in a work center, and a Duty Tak List (DTL)—a listing containing all the tasks to be trained on in a duty position. Duty sections have a Master Training Plan (MTP) and includes this CFETP along with AF Forms 797 and 1098. The supervisor creates the MTL, DTL, and MTP.

2. Total Force Training Record (TFTR). The enlisted training documentation has migrated from the hard copy to electronic TFTR. Refer to your unit training manager (UTM) for the most current policies and guidance on training documentation. The TFTR is an enterprise-wide custom training management system designed to replace the paper-based training records system. It is the electronic equivalent of an AF Form 623, *Individual Training Record Folder*, and will be used by career fields within the AFMS to document all training actions. The TFTR allows training plans to be established by Career Field/AFSC, duty position/team member, trainee/trainer/certifier, and any group of tasks that require management, tracking, and documentation. The TFTR components are managed by the supervisor.

3. Documentation of Training. The purpose of this section is to provide guidelines and examples of proper documentation on the many forms used in training physical medicine and orthotic personnel. Training documentation helps to assess mission capability and readiness, individual strengths and weaknesses, resources needed to support quality patient care, and defines requirements for individual career progression.

3.1. AF Form 797 is be used to record training for tasks that are not otherwise documented in the CFETP.

3.2. AF Form 1098 is used to list mandatory training requirements that may vary from facility to facility. At a minimum, these requirements should be reviewed on an annual basis and updated as required.

3.3. Qualification Training Progress Records were developed to enhance OJT. They provide the trainer with a breakdown of task performance skills to aid in performance evaluation. The evaluation of each task results in either a satisfactory or unsatisfactory score.

3.4. AF Form 623a. Use the AF Form 623a or electronic equivalent (myTraining) to document all progress of individual training. Document the start and completion dates of unit orientation, and reference the date of the orientation checklist. In addition, document the member's entry into upgrade training, initial evaluation results, and periodic evaluations of training progress to include CDC progress. Information on extensions, waiver requests, or breaks in training should be clearly documented. Document any decertification proceedings, to include dates, reasons for decertification, and other applicable information. Accomplish an initial evaluation when a new

member arrives to the unit or when the member changes duty positions. Document all other actions pertaining to training IAW DAFMAN 36-2689, Training Program. **NOTE:** myTraining includes templates for documentation of orientation, initial upgrade training brief, and upgrade training documentation.