DoD Space Planning Criteria

Chapter 540: Radiology, Nuclear Medicine, and Radiation Oncology
March 25, 2025

Originating Component: Defense Health Agency Facilities Enterprise

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Releasability: No Restrictions

Purpose: This issuance: To provide space planning criteria guidance in support of planning, programming, and budgeting for military Medical Treatment Facilities (MTFs) that fall under the authority of the Defense Health Agency (DHA).

SUMMARY of CHANGE

This revision, dated March 25, 2025, includes the following:

- Sections renamed and numbered: design considerations moved to the front of the document.
- Removed workload driven formula example; now located in Chapter 110. Workload planning factors validated with product line SME's/Leaders.
- Workload driven defaults are now fixed values for this chapter.
- The following spaces have been moved to Chapter 610 Common Areas: staff toilets, lockers, lounges, and conference rooms.
- Moved Graduate Medical Education (GME) administrative spaces to Chapter 230 Education and Training.
- Updated definitions in Glossary.

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SECTION 1: PURPOSE AND SCOPE

1. This chapter outlines space planning criteria for Radiology, Nuclear Medicine, and Radiation Oncology as it applies to a military Medical Treatment Facility (MTF) or other type of facility that supports medical services. Although there is little patient crossover between these units at many facilities, the increasing proliferation of hybrid equipment and integrated care will make the coordination of these programs increasingly important over time. Additionally, these three departments are addressed in a common chapter due to the additional levels of complexity associated with the effective planning for imaging and therapy equipment. All these services, or a select number of them, may be located inside or immediately adjacent to an MTF that may include inpatient care, or full scope ancillary departments.

2. The exam / treatment rooms provided in this chapter are defined with the minimum recommended area and equipment. This is based on lower-acuity patients, non-interventional use, and an absence of special use equipment, unless otherwise noted. As these factors change (e.g., use of general anesthesia or emergent / trauma imaging), the area associated with these services may need to be increased from the provided values. Due to the high cost of capital investment imaging and radiation therapy systems, it is highly recommended that facility space planning should anticipate changes in functional or clinical use that may be likely within a five-year period following the start of normal facility operations.

3. Interventional radiology (imaging services directly in support of concurrent therapeutic care, such as angioplasty or cardiac stenting) is not specifically addressed in this chapter. While many of the areas defined here in Chapter 540 can be modified to support minimally invasive interventional or image-guided procedures (such as image-guided biopsy), information on traditional interventional radiology space planning criteria can be found in Chapter 440: Surgical / Interventional Services & Ambulatory Surgery Center.

4. Imaging resources may be distributed throughout the MTF; therefore, imaging resources for clinical services such as Chapter 311 Specialty Services, Chapter 312 Orthopedics, Podiatry, Chiropractic, Physical Medicine & Rehabilitation (PM&R) and Sports Medicine, Chapter 316 Cardiology, Pulmonary, and Sleep Disorders Services, Chapter 350 Emergency and Ambulance Services and Chapter 360 Women's Health Clinic will reference the modalities specific to those services from this chapter. Care must be taken to avoid duplicate programming of equipment-based spaces on the same workload count, and special attention should also be given to assuring that the resources (to include staffing and clinical support) necessary to provide all services programmed are available and fully supported by the command.

5. The space planning criteria in this chapter apply to all DHA MTFs and are based on current DHA policies and directives, established and/or anticipated best practices, industry guidelines and standards, and input from MHS Subject Matter Experts (SME) and DHA Directorates. As directed by the DHA, these space criteria are primarily workload driven; additional drivers are staffing and mission. Room Codes (RCs) in this document are based

on the latest version of UFC 4-510-01, Design: Military Medical Facilities, Appendix B, Architectural and Engineering Design Requirements.

SECTION 2: PLANNING AND PROGRAMMING REQUIREMENTS

1. Before the start of detailed planning the Planner must coordinate all imaging modality requirements through the DHA Integrated Imaging Services Program Management Office (ICS PMO). This office has Enterprise-wide responsibility for the procurement and management of all imaging and radiation-producing equipment. Additional guidance and points of contact may be found on their website at the following link: https://info.health.mil/dhss/home/ICSPMO/Pages/Home.aspx.

2. Planners will consider local workload projections, staffing, and anticipated services to develop a project based on these criteria. The staffing projections used by planners to program requirements must be validated and aligned with the authorized manning document for the project. When no official guidance, policy or directive exists to validate space or program requirements, the planner will consult with their supervisor, and at their supervisor's discretion, the issue(s) may be elevated to senior leadership for the determination of the final project requirements.

3. Space planning criteria have been developed based on an understanding of the activities involved in the functional areas required for Radiology, Nuclear Medicine, and Radiation Oncology and its relationship with other services in a medical facility. These criteria are predicated on established and/or anticipated best practice standards, as adapted to provide environments supporting the highest quality health care for eligible beneficiaries.

4. To the maximum extent possible general administrative spaces will be programmed into team workroom(s) to promote improved collaboration and coordination of care through increased communication and staff efficiency. Planners should consider programming private offices for professional staff (doctors, radiologists, oncologists, etc.) that require undistracted workspace. Distractions while working in a noisy environment could seriously compromise patient safety. Many military physicians wear multiple "hats", that includes supervisory duties requiring the need for private space for counseling and mentoring staff members.

5. To enhance patient safety, provide a Medication Safety Zone for the Radiology, Nuclear Medicine, and Radiation Oncology area. It can be a medication preparation room (MEDP1), or an area in the treatment/procedure room, as well as a self-contained medication dispensing unit, an automated medication dispensing station, or another system located in the clean utility (UCCL1). The planner should determine whether medications are prepared in the ancillary pharmacy, and then administered to the patient by Radiology, Nuclear Medicine, and Radiation Oncology staff in single, unit doses. In this instance, no medication prep room is required in the clinic area. If the Radiology, Nuclear Medicine, and Radiation Oncology staff are calculating dosages, preparing the medication, and administering it to the patient, an enclosed Medication Preparation Room (MEDP1) will be programmed in the clinic support area.

6. Individual PET uptake rooms are preferable to larger, multiple patient uptake rooms due to radiation safety considerations and the desire to avoid mental stimuli during uptake.

7. Imaging simulators may be dedicated to Radiation Oncology. At lower patient volumes, scanners located in Radiology or Nuclear Medicine may be outfitted with simulation hardware and software to support simulation activities for Radiation Oncology patients.

8. For calculation of the number of building support spaces (Vestibules, Lobbies, Multi-fixture Public and Staff Toilets, Staff Lounges and Locker Rooms, Conference Rooms, Communication Closets, and Janitor Closets), please refer to Chapter 610: Common Areas.

9. For space criteria requirements to support Graduate Medical Education in the MTF, refer to Chapter 230: Education and Training.

10. The range of modality throughput is based upon a calculation that first quantifies the full capacity of that fixed space, then estimates how many annual encounters (imaging studies) it should support, based on other variable resources such as availability of providers, support staff, and patients.

11. Room Default Parameters:

    a. Operating Days per Year SEPS default: *Please refer to Table 1*

    b. Hours of Operation per Day SEPS default: *Please refer to Table 1*

    c. Average Length of Encounter (ALOE) SEPS default: *Please refer to Table 2*, *see Glossary for definition of ALOE.*

    d. Room Utilization Factor SEPS default: 80%

TABLE 1: SYSTEM AVAILABILITY (DAYS PER YEAR & HOURS PER DAY)

MODALITY	MTF DAYS PER YEAR	HOURS OF OPERATION PER DAY
General Radiology	250	8
Radiographic/Fluoroscopy (R/F)	250	8
Mammography (Screening)	250	8
Mammography (Diagnostic)	250	8
Bone Densitometry (DEXA)	250	8
Ultrasound (General Purpose)	250	8
Ultrasound (Maternal/Fetal)	250	8
Ultrasound (OB/GYN)	250	8
Ultrasound (Echocardiology)	250	8
Computed Tomography (CT)	300	16
Magnetic Resonance Imaging (MRI)	300	16
Nuclear Medicine (Cardiac)	250	8
Nuclear Medicine (Bone Scan)	250	8
Nuclear Medicine (Full Scope)	250	8

SPECT / CT	250	8
PET / CT (BCA Driven)	250	8
Single-Axis Linear Accelerator	250	8

12. Calculation of directly workload-driven room types is implemented in SEPS based on the following table and answers to the Input Data Statements:

TABLE 2: WORKLOAD PARAMETER CALCULATION

[redacted]

IMAGING ENCOUNTERS	AVERAGE LENGTH OF ENCOUNTER (minutes)	ANNUAL WORKLOAD PER EXAM / DIAGNOSTIC ROOM (*)	ANNUAL WORKLOAD WITH 80% UTILIZATION FACTOR APPLIED	MINIMUM ANNUAL WORKLOAD TO GENERATE ONE ROOM (25%)
General Radiology	7.5	16,000	12,800	3,200
Radiographic / Fluoroscopy (R/F)	45	1,663	1,330	333
Mammography, (Screening)	15	8,000	6,400	1,600
Mammography (Diagnostic)	30	4,000	3,200	800
Bone Densitometry	15	8,000	6,400	1,600
Ultrasound (General Purpose)	45	2,660	2,128	532
Ultrasound (Maternal/Fetal)	60	2,000	1,600	400
Ultrasound (OB/GYN)	80	1,500	1,200	300
Ultrasound (Echocardiology)	120	1,000	800	200
CT Scanning	20	14,400	11,520	2,880
MRI Scanning	45	6,400	5,120	1,280
Nuclear Medicine (Cardiac)	60	2,000	1,600	400
Nuclear Medicine (Bone Scan)	45	2,660	2,128	532
Nuclear Medicine (Full Scope)	100	1,200	960	240
SPECT / CT Scanning Room	60	1,536	1,229	307
PET / CT Scanning	60	2,000	1,600	400

Single-Axis Linear Accelerator	30	3,072	2,458	614

See Chapter 110: General for an example calculation.

*This column assumes modality utilization at 100%.

SECTION 3: DESIGN CONSIDERATIONS

The following design considerations are intended to provide planners and designers with guidance on how to follow world-class and evidence-based design strategies for new and renovation of existing healthcare facilities. For a more comprehensive list, refer to the latest version of the World Class Checklist (https://home.facilities.health.mil). Also refer to the Facility Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals and Guidelines for Design and Construction of Outpatient Facilities for additional information.

3.1. NET-TO-DEPARTMENT GROSS FACTOR.

The net-to-department gross factor (NTDG) for Radiology, Nuclear Medicine and Radiation Oncology is **1.50**. This number when multiplied by the programmed net square foot (NSF) area determines the departmental gross square feet. This factor accounts for the space occupied by internal department circulation and interior partitions and other construction elements not defined by the net square foot area.

3.2. GENERAL DESIGN CONSIDERATIONS.

1. Consider technology requirements early on in design. Technology can be leveraged for safety and efficiency.

2. Consider space (temporary or fixed) and IM/IT capabilities for all team members to be able to accomplish their required documentation.

3. The clinic design shall be zoned for patient, visitor, support, and staff areas to improve efficiency. A separate flow will be created between patients and visitors (on stage) and staff (off stage) to optimize privacy, safety, and overall satisfaction. "On Stage" is defined as the Public / Reception Zone and the Patient Care / Treatment Zone. "Off Stage" is defined as the Staff / Administration Zone, the Clinic Support Zone and staff/service corridors.

4. Provide a separate staff/delivery entrance in the off-stage area of the clinic. This will be utilized for patient transport to a higher level of care in the event of an emergency, and it will accommodate a transport gurney, inpatient bed, supply delivery, and waste stream management.

5. Many diagnostic and therapeutic services within this chapter make use of ionizing radiation (including X-ray, CT scanner, Mammography, Nuclear Camera, PET / CT, and Linear Accelerator). In each room in which an ionizing radiation emission source is located, stored, prepared, generated, calibrated, used, or disposed of, the Designer of Record (DOR) is responsible to determine the necessary shielding quantities / materials to be used in construction. It is recommended that a health/medical physicist be engaged in early design discussions of radiation therapy and nuclear medicine clinics. Highly penetrating types of radiation used in radiation therapy and nuclear medicine can present significant challenges in department layout and may require innovative solutions when

taking into consideration the type of shielding protection required. (e.g. weight of lead shielding surrounding a PET uptake room will require structural design coordination)

3.3. RECEPTION AREAS.

1. Radiology, nuclear medicine, and radiation oncology services should have a clearly identified Reception Area. If these areas share reception / waiting functions with other clinical services (e.g., laboratory, women's health, or nuclear medicine, etc.), these co-located services should be clearly identified as sharing Reception / Waiting.

2. Patient check-in kiosk should be positioned to be clearly visible to patients and visitors entering the reception area and should be in the line-of-sight from the reception counter.

3. Seating in the waiting area should be comfortable with adequate space for patients with wheelchairs and walking aids. Consider arranging seats into separate, small clusters to accommodate social distancing and enhance physical separation patients.

4. To maximize speech privacy for patients at reception, provide open, clear floor area between the waiting seats and reception.

5. Consider flexible seating options that can accommodate greater demands during peak service hours.

3.4. PATIENT AREAS.

1. Sub-waiting areas should be combined for imaging modalities which share common patient populations and preparations.

2. Inpatient holding areas should provide area for exam preparations around a patient gurney.

3. Inpatient holding areas should allow direct patient observation if a patient's condition warrants.

4. Additional Patient Dressing Cubicles may be subdivided if accessibility requirements are achieved.

5. Radiographic rooms include the area for exposure control alcoves.

6. Adjustable lighting levels are essential in radiology exam areas. Provide dimmable lighting when possible.

7. For ultrasound rooms which may serve abdominal exams, it is recommended that the corresponding ultrasound toilet be directly accessed from the Ultrasound Room.

8. Exam Rooms: No exam room is intended to be dedicated to any specific provider; rather exam rooms can be always available for use. The use of a cart stocked with various

equipment to support each specialty may be considered for immediate functional use as needed, and to provide greater versatility of the exam room.

9. Avoid placing patient spaces on exterior walls at ground level. If patient exam/imaging rooms have windows, they shall be equipped with window treatments that can ensure patient privacy.

3.5. CLINIC SUPPORT.

1. Clean and Soiled Utility areas may be subdivided and distributed to be convenient to each of the imaging areas, as dictated by need.

2. Equipment Storage is identified for only storage needed within the Radiology, Nuclear Medicine, and Radiation Oncology Department. Storage outside of the department for items such as portable X-ray or other radiology resources must be determined independently.

3. Imaging services will require a Picture Archive and Communication System (PACS) host environment. This may be located within the Radiology department, but typically is in a data center. Data center space planning criteria are included in Chapter 240 Information Management (IM) "Server Room".

4. Optimize staff efficiency and performance by providing decentralized support spaces (e.g., supplies, medications, and equipment). Keep staff travel distances to a minimum.

5. In equipment storage rooms, assure adequate power is provided for all equipment requiring charging housed within these rooms.

6. The location and number of recessed or semi-recessed Automatic External Defibrillator (AED) cabinets will be determined during project design. The Designer of Record (DOR) is responsible to ensure quantity, placement, and all appropriate markings (signage) are shown in the final design solution. The DOR will coordinate with the design and construction Agent and clinical representative to ensure adequate placement and facility coverage.

7. In cases where a resuscitation cart with associated equipment and medical supplies is warranted, the planner should determine whether placement is appropriate in an alcove (RCA01) near a patient treatment zone that includes an electrical receptacle for equipment charging, or if they can be added in a treatment space as part of the room code equipment contents.

3.6. STAFF AND ADMINISTRATION.

1. In any room / office with PACS viewing capability, full-range dimmable lighting should be provided.

2. If windows are provided into any room / office with PACS viewing capability, blackout curtains should be provided.

3. Radiologist Workrooms, offices and Viewing Rooms should be provided with acoustic treatments to prevent patient information dictations from being overheard in adjacent spaces.

4. Team Workroom: Team Workrooms and staff areas should be located so staff members may have private conversations regarding patients and clinical matters without being heard by patients or visitors.

3.7. COMPUTED TOMOGRAPHY (CT) PATIENT AREA.

1. Sub-waiting, Inpatient Holding, Screening / Patient Prep, Patient Dressing Cubicle, and Personal Property Locker for CT may be combined with Radiology if services are proximal and there are no associated risks in doing so.

2. If sedation is intended to be provided, the Prep / Recovery Room should be positioned with direct line of sight from the Nurse Station.

3. The Control Room and CT Scanning Room should be configured to allow the technologist at the control console to have a clear view of the patient in the CT gantry.

4. Anticipate additional space needs in CT Scanning Room based on changes in patient acuity and interventional clinical uses.

5. Carefully coordinate siting requirements / restrictions when CT Scanning Room is planned to be adjacent to MRI Scanning Room.

6. Due to temperature regulation considerations, it is recommended that a CT System Component Room be provided and utilized even if the CT manufacturer permits the CT system components to be located within the Scanning Room or the Control Room.

3.8. MAGNETIC RESONANCE IMAGING (MRI) PATIENT AREA.

1. MRI patient area layout should adhere to the safety and security principles of the American College of Radiology (ACR) 4-Zone model as identified in the most current edition of the ACR Manual on MR Safety.

2. In principle, the four-zone model requires greater levels of screening, access control, and supervision as untrained persons approach the MRI Scanning Room.

3. Zone I: Areas with no direct relationship to an MRI service, and no associated physical hazards. This zone includes all areas that are freely accessible to the public.

4. Zone II: Areas within an MRI suite where persons self-select to enter the MRI area, and where both physical and clinical screenings of persons who will be proceeding further are conducted. The design of this area shall facilitate the ability of patient screening to be conducted privately (i.e. technologists should be able to speak loud enough to be understood by patients with modest hearing deficits without being overheard by other patients). There are to be no physical hazards associated with MRI (static magnetic field)

in Zone II areas. This zone is the interface between the uncontrolled, publicly accessible Zone I and the strictly controlled Zones III and IV.

5. Zone III: Areas in proximity to the MRI scanner that meet one or both of the following criteria must be treated as Zone III areas: Areas in which a person may access static magnetic fields more than 5 Gauss, or areas from which a person can directly access the MRI Scanning Room. Zone III areas must be physically restricted from Zone II areas. Independent access is to be provided only to facility-designated personnel who have demonstrated competence in MRI safety. Persons should only be permitted to enter Zone III following successful completion of physical and clinical screening for MRI contraindications, as appropriate. Patients or other non-MRI personnel within Zone III must always be under the direct supervision of facility-designated personnel who have demonstrated competence in MRI safety.

6. Zone IV: The MRI Scanning Room, itself. It is within this room that the physical hazards related to MRI are the greatest. Relevant gauss lines (5 Gauss, 200 Gauss) should be marked on the floor of this zone as these limits are often stipulated in MR Conditional equipment, device labeling.

7. Ferromagnetic Detection Alcove may be located immediately prior to the MRI Scanning Room Entrance, or near the entrance to the MRI Control Room. It is preferable to locate the Ferromagnetic Detection systems such that doors do not swing into / through the detection zone.

8. The Control Room and MRI Scanning Room should be configured to allow the technologist at the control console to have a clear view of the patient in the MRI gantry.

9. Due to the unique risks associated with MRI scanning equipment, patient support spaces for MRI shall not be shared / combined with those of other imaging modalities.

10. Inpatient holding areas should provide area for MRI Scanning preparations around a patient gurney.

11. Inpatient holding areas should allow direct patient observation if a patient's condition warrants.

12. If sedation is intended to be provided, the Prep / Recovery Room should be positioned with direct line of sight from a nurse station.

13. Inpatient Holding may be integrated with sedation.

14. Additional Patient Dressing Cubicles may be subdivided if accessibility requirements are achieved.

15. MRI scanners are highly sensitive to vibration. It is recommended that the locations of MRI suites be planned to avoid proximity to fans, motors, pumps, drives, elevators, and loading docks and other such equipment.

16. MRI scanners may be highly sensitive to ferromagnetic materials used in construction, particularly in the floor assembly. Seek to minimize / eliminate ferrous materials in the floor structure beneath the MRI Scanning Room.

17. It is generally preferable to place MRI Scanning Rooms on slab-on-grade construction to minimize potential conflicts with structure-borne vibration and ferrous content in structured floors.

18. MRI scanners can produce damaging levels of sound pressure during the image acquisition process. Enclosing walls, floor, and deck construction should be selected to control acoustic transmission to other areas. Similarly, HVAC ductwork which communicates with other areas should be provided with acoustic treatment. Finish materials within the MRI Scanning Room should be selected with consideration of their acoustic properties.

19. Due to temperature regulation considerations, it is recommended that an MRI System Component Room be provided and utilized even if the MRI manufacturer permits the MRI system components to be located within the Exam Room or the Control Room.

20. MRI Scanners require chilled water supplies. Dedicated water chillers are preferred. Extreme care should be exercised before alternative sources are used (e.g. main hospital supply). Some past uses of hospital chilled water have had difficulty maintaining the tight temperature tolerances required by MRIs. It can also complicate future modifications/maintenance to the hospital chilled water supply.

3.9. NUCLEAR MEDICINE PATIENT AREA.

1. Nuclear / Gamma Camera Scanning Room, SPECT / CT Scanning Room, and PET / CT Scanning Room should each be located / positioned such that the scanner's detectors are not oriented towards another Nuclear / Gamma Camera Scanning Room, Testing / Treadmill Room, Dose Storage / Calibration, Hot Lab, Decay Storage, Radiopharmaceutical Injection Room, PET / CT Injection / Uptake Room, other nuclear medicine scanning room, or other radiological sources.

2. Patient flow should be carefully considered to segregate patients injected with higher-energy radiopharmaceuticals (typically used for PET imaging) from other persons.

3. Workflow in support of PET imaging services should minimize the travel distance and crossing circulation routes of 'hot' patients with other persons.

4. PET/CT uptake rooms should be located adjacent to the imaging room. Additionally, they should have direct or near direct access to a hot restroom to minimize patient movement after dosing.

5. If gaseous or aerosolized radiopharmaceuticals are to be used, additional HVAC system controls should be designed accordingly. Closely coordinate the clinical / research intentions with the facility design.

6. Coordinate storage security requirements for radioisotopes with Radioactive Materials (RAM) license requirements.

7. Coordinate shielding design requirements with an appropriately credentialed health/medical physicist.

3.10. NUCLEAR MEDICINE SUPPORT.

1. It is recommended to locate Decay Storage and Hot Lab facilities off-axis from the line of detection of Nuclear / Gamma Camera Scanning Room, SPECT / CT Scanning Room, or hybrid PET imaging device scanning room.

2. Hot Lab / Radiopharmacy design program requirements depend extensively upon nuclear medicine scanning equipment, utilized radiopharmaceuticals, and clinical applications. Coordinate closely with end-user(s) to develop appropriate program and space needs. Consider US Pharmacopeia (USP) standard 825 during the design.

3. Radioisotope generator, if utilized, may require significant room shielding; however, storing them in shielded cabinets is the preferred method. Carefully coordinate the selection of generator equipment with siting and shielding requirements. Coordinate shielding design requirements with an appropriately credentialed health/medical physicist.

3.11. RADIATION ONCOLOGY BEAM PATIENT AREA.

1. Adjustable lighting levels are essential in beam therapy exam areas. Provide dimmable lighting when possible.

2. If beam therapy vault(s) are provided to support High Dose Rate (HDR) procedures (see FAs 15 & 16 notes), coordinate the layout and infrastructural supports (e.g., procedure lighting and medical gasses) to accommodate these procedures. For multi-purpose vaults, allocated NSF may need to be increased.

3. Due to extreme thicknesses of vault wall construction and their disproportionate and concentrated effect on net-to-gross floor area, NSF area associated with the thickness of each vault wall assembly may need to be factored independently from standard departmental grossing factors. Vault wall thickness (and resulting NSF) will depend upon specific properties of the beam therapy equipment and vault design.

4. In addition to the imaging and therapy devices defined in the earlier sections of this chapter, there are other imaging and therapy devices available. MHS facilities specific space planning criteria are not provided. Because of their availability, however, it is appropriate to minimally identify them:

    a. Multi-Axis Robotic Beam Therapy (e.g. “Cyber-knife”)

    b. Proton Beam Therapy

c. Stereotactic Radiosurgery

d. Tomotherapy Room

e. PET / MRI

f. MRI / Beam Therapy

Each of the above devices will have specific programmatic needs beyond the immediate scanning room. Should one of these advanced devices be identified for a project, the planning and design teams are advised to carefully coordinate siting and space needs requirements with the equipment manufacturer / vendor. Additionally, it is strongly recommended to enlist expert radiology / therapy architects as early in the process as possible.

3.12. RADIATION ONCOLOGY ISOTOPE PATIENT AREA.

1. Low Dose Rate (LDR) Brachytherapy may be performed in a procedure room that has been provided with appropriate shielding. Coordinate shielding design requirements with an appropriately credentialed health/medical physicist.

2. High Dose Rate (HDR) Brachytherapy may require vault-style assembly to achieve necessary shield attenuation. For lower volume HDR services, it may be possible to utilize beam therapy vault enclosure(s) for HDR procedures. Coordinate functional and space requirements. Coordinate shielding design requirements with an appropriately credentialed health/medical physicist. Bulk seed storage and decay storage for HDR and LDR brachytherapy is recommended to be centrally provided in 7.3.FA3: Nuclear Medicine Radiopharmacy.

3.13. RADIATION ONCOLOGY SUPPORT.

1. Where feasible (and if provided independently), Radiation Oncology's Hot Lab / Radiopharmacy may be co-located with Nuclear Medicine's Hot Lab / Radiopharmacy.

2. Where feasible, Radiation Oncology's Decay Storage may be co-located with Nuclear Medicine's Decay Storage.

SECTION 4: PROGRAM DATA REQUIRED: RADIOLOGY

4.1. INPUT DATA STATEMENTS. Input Data Statements are based on questions about Workload (W), Mission (M), Staffing (S) and Miscellaneous (Misc) information.

1. Are inpatient services projected in the facility? (M)
2. Are Sedation services projected to support Radiology? (M)
3. How many annual General Radiology encounters are projected? (W)
4. How many annual Radiographic / Fluoroscopy (R/F) encounters are projected? (W)
5. How many annual Screening Mammography encounters are projected? (W)
6. How many annual Diagnostic Mammography encounters are projected? (W)
7. How many annual Bone Densitometry encounters are projected? (W)
8. How many annual General Purpose Ultrasound encounters are projected? (W)
9. How many annual Maternal/Fetal Ultrasound encounters are projected? (W)
10. How many annual OB/GYN Ultrasound encounters are projected? (W)
11. How many annual Echocardiology Ultrasound encounters are projected? (W)
12. Is Computed Tomography (CT) services projected to support Radiology? (M)
    - 12.1. How many annual Computed Tomography (CT) Scanning encounters are projected? (W)
    - 12.2. Is Uninterrupted Power Supply (UPS) for the CT System Component Room projected to support Radiology services? (Misc)
13. Is a Computed Tomography (CT) Simulator projected to support Radiology? (M)
14. Is Magnetic Resonance Imaging (MRI) services projected to support Radiology? (M)
    - 14.1. How many annual MRI encounters are projected? (W)
    - 14.2. Is Uninterrupted Power Supply (UPS) for the MRI System Component Room projected to support Radiology services? (Misc)
15. Is an On-Call Room projected to support Radiology? (Misc)
16. Is a Picture Archiving and Communication System (PACS) Viewing Room within Radiology Staff and Administration projected to support Radiology services? (Misc)
17. How many Radiology FTE positions are projected on peak shift per the authorized manning document? (S)

4.2. COMPUTED STATEMENTS.

1. Room Utilization Factor (Computed) (Default: .80)
2. Hours per day (Computed) (Default:8)
3. Days per year (Computed) (Default:250)
4. Patient care hours per year (Computed) (Default: [Hours per day] x [Days per year])
5. General Radiology Average Length of Encounter (ALOE) in Hours (Computed) (Default: .125)
6. Radiographic / Fluoroscopy (R/F) Average Length of Encounter (ALOE) in Hours (Computed) (Default: .75)
7. Screening Mammography Average Length of Encounter (ALOE) in Hours (Computed) (Default: .25)

8. Diagnostic Mammography Average Length of Encounter (ALOE) in Hours (Computed) (Default: .5)
9. Bone Densitometry Average Length of Encounter (ALOE) in Hours (Computed) (Default: .25)
10. General Purpose Ultrasound Average Length of Encounter (ALOE) in Hours (Computed) (Default: .75)
11. Maternal/Fetal Ultrasound Average Length of Encounter (ALOE) in Hours (Computed) (Default: 1.0)
12. OB/GYN Ultrasound Average Length of Encounter (ALOE) in Hours (Computed) (Default: 1.33)
13. Echocardiology Ultrasound Average Length of Encounter (ALOE) in Hours (Computed) (Default: 2.0)
14. General Radiology Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [General Radiology Average Length of Encounter (ALOE) in Hours])
15. Calculated number of General Radiology rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual General Radiology encounters are projected?] / [General Radiology Workload Capacity]))
16. Radiographic / Fluoroscopy (R/F) Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [Radiographic / Fluoroscopy (R/F) Average Length of Encounter (ALOE) in Hours])
17. Calculated number of Radiographic / Fluoroscopy (R/F) rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Radiographic / Fluoroscopy (R/F) encounters are projected?] / [Radiographic / Fluoroscopy (R/F) Workload Capacity]))
18. Screening Mammography Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [Screening Mammography Average Length of Encounter (ALOE) in Hours])
19. Calculated number of Screening Mammography rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Screening Mammography encounters are projected?] / [Screening Mammography Workload Capacity]))
20. Diagnostic Mammography Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [Diagnostic Mammography Average Length of Encounter (ALOE) in Hours])
21. Calculated number of Diagnostic Mammography rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Diagnostic Mammography encounters are projected?] / [Diagnostic Mammography Workload Capacity]))
22. Bone Densitometry Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [Bone Densitometry Average Length of Encounter (ALOE) in Hours])
23. Calculated number of Bone Densitometry rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Bone Densitometry encounters are projected?] / [Bone Densitometry Workload Capacity]))
24. General Purpose Ultrasound Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [General Purpose Ultrasound Average Length of Encounter (ALOE) in Hours])

25. Calculated number of General Purpose Ultrasound rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual General Purpose Ultrasound encounters are projected?] / [General Purpose Ultrasound Workload Capacity]))
26. Maternal/Fetal Ultrasound Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [Maternal/Fetal Ultrasound Average Length of Encounter (ALOE) in Hours])
27. Calculated number of Maternal/Fetal Ultrasound rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Maternal/Fetal Ultrasound encounters are projected?] / [Maternal/Fetal Ultrasound Workload Capacity]))
28. OB/GYN Ultrasound Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [OB/GYN Ultrasound Average Length of Encounter (ALOE) in Hours])
29. Calculated number of OB/GYN Ultrasound rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual OB/GYN Ultrasound encounters are projected?] / [OB/GYN Ultrasound Workload Capacity]))
30. Echocardiology Ultrasound Workload Capacity (Computed) (Default: ([Room Utilization Factor] x [Patient care hours per year]) / [Echocardiology Ultrasound Average Length of Encounter (ALOE) in Hours])
31. Calculated number of Echocardiology Ultrasound rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Echocardiology Ultrasound encounters are projected?] / [Echocardiology Ultrasound Workload Capacity]))
32. CT and MRI Scanning Room Utilization Factor (Computed) (Default: .80)
33. CT and MRI Scanning Hours per day (Computed) (Default: 16)
34. CT and MRI Scanning Days per year (Computed) (Default:300)
35. CT and MRI Patient care hours per year (Computed) (Default: [CT and MRI Scanning Hours per day] x [CT and MRI Scanning Days per year])
36. CT Scanning Average Length of Encounter (ALOE) in Hours (Computed) (Default: .33)
37. MRI Scanning Average Length of Encounter (ALOE) in Hours (Computed) (Default: .75)
38. CT Scanning Workload Capacity (Computed) (Default: ([CT and MRI Scanning Room Utilization Factor] x [CT and MRI Patient care hours per year]) / [CT Scanning Average Length of Encounter (ALOE) in Hours])
39. Calculated number of CT Scanning rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Computed Tomography (CT) Scanning encounters are projected?] / [CT Scanning Workload Capacity]))
40. MRI Scanning Workload Capacity (Computed) (Default: ([CT and MRI Scanning Room Utilization Factor] x [CT and MRI Patient care hours per year]) / [MRI Scanning Average Length of Encounter (ALOE) in Hours])
41. Calculated number of MRI Scanning rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual MRI encounters are projected?] / [MRI Scanning Workload Capacity]))
42. Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning) (Computed) (Default: [General Radiology (XDR01)], [Radiographic / Fluoroscopy (R/F) (XDRF1)], [Mammography, Screening (XDM01)], [Mammography, Diagnostic (XDM02)], [Bone Densitometry (XDBD1)], [General Purpose Ultrasound (XDUS1)], [Maternal/Fetal Ultrasound (XDUS1)], [OB/GYN Ultrasound (XDUS1)], [Echocardiology Ultrasound (XDUS1)])

43. Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning) (Computed) (Default: [General Radiology (XDR01)], [Radiographic / Fluoroscopy (R/F) (XDRF1)], [Mammography, Screening (XDM01)], [Mammography, Diagnostic (XDM02)], [Bone Densitometry (XDBD1)], [General Purpose Ultrasound (XDUS1)], [Maternal/Fetal Ultrasound (XDUS1)], [OB/GYN Ultrasound (XDUS1)], [Echocardiology Ultrasound (XDUS1)], [Scanning Room, Computed Tomography (CT) (XCTS1)], [Scanning, MRI (XMRS1)])

4.3. SHORTCUTS.

1. number of General Radiology rooms: [Calculated number of General Radiology rooms based on workload]
2. number of Radiographic / Fluoroscopy (R/F) rooms: [Calculated number of Radiographic / Fluoroscopy (R/F) rooms based on workload]
3. number of Screening Mammography rooms: [Calculated number of Screening Mammography rooms based on workload]
4. number of Diagnostic Mammography rooms: [Calculated number of Diagnostic Mammography rooms based on workload]
5. number of Bone Densitometry rooms: [Calculated number of Bone Densitometry rooms based on workload]
6. number of General Purpose Ultrasound rooms: [Calculated number of General Purpose Ultrasound rooms based on workload]
7. number of Maternal/Fetal Ultrasound rooms: [Calculated number of Maternal/Fetal Ultrasound rooms based on workload]
8. number of OB/GYN Ultrasound rooms: [Calculated number of OB/GYN Ultrasound rooms based on workload]
9. number of Echocardiology Ultrasound rooms: [Calculated number of Echocardiology Ultrasound rooms based on workload]
10. number of CT Scanning rooms: [Calculated number of CT Scanning rooms based on workload]
11. number of MRI Scanning rooms: [Calculated number of MRI Scanning rooms based on workload]

SECTION 5: SPACE PLANNING CRITERIA: RADIOLOGY

For calculation of the number of building support spaces (Vestibules, Lobbies, Vending Machine areas, Multi-fixture Public and Staff Toilets, Staff Lounges and Locker Rooms, Conference Rooms, Security Services, Communication Closets, and Janitor Closets), please refer to Chapter 610: Common Areas.

5.1. FA1: RADIOLOGY RECEPTION.

1. Waiting (WRC01) — 120 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional 64 NSF for every increment of two [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] greater than four

The minimum NSF accommodates 6 chairs at 16 NSF and 1 chair at 25 NSF.

2. Kiosk, Patient Check-in (CLSC1) — 15 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional one for every increment of eight [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] greater than sixteen

3. Reception (RECP1) — 100 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional 50 NSF for every increment of eight [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] greater than sixteen

Minimum allocated NSF accommodates two FTEs.

5.2. FA2: RADIOLOGY PATIENT AREA.

1. Sub-Waiting (WRC03) — 60 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional 30 NSF per each [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] greater than two

Allocated NSF for Sub-Waiting can be subdivided during project development.

2. Inpatient Holding (WRL01) — 90 NSF

a. Provide one if [Are inpatient services projected in the facility?]

3. Screening / Patient Prep (EXRG4) — 120 NSF

a. Provide one if [Are Sedation services projected to support Radiology?]

Dedicated to Point of Care blood testing and IV preparation, patient consult, venipuncture.

4. Cubicle, Patient Dressing (DR001) 50 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional one for every increment of two [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] greater than two

Allocated NSF provides space for a seat or bench, mirror, locker for securing valuables and provisions for hanging patients' clothing. Cubicles should be provided convenient to the waiting areas and procedure room(s) and may be grouped together.

5. General Radiology (XDR01) 300 NSF

a. Provide one per each [number of General Radiology rooms]

6. Radiographic / Fluoroscopy (R/F) (XDRF1) 300 NSF

a. Provide one per each [number of Radiographic / Fluoroscopy (R/F) rooms]

7. Toilet, Radiographic / Fluoroscopy (R/F) Patient (TLTU1) 60 NSF

a. Provide one per each [Radiographic / Fluoroscopy (R/F) (XDRF1)]

Dedicated R/F Toilet accessed directly from the R/F Room.

8. Mammography, Screening (XDM01) 150 NSF

a. Provide one per each [number of Screening Mammography rooms]

Mammography may be separately provided in Women's Health Clinic if in clinic concept of operations, please refer to Chapter 360: Women's Health Clinic. While used frequently for breast exams for women, Mammography may also be used for screening male patients for breast cancer. Consideration should be paid to the location of Mammography services based on the beneficiary population being served.

9. Mammography, Diagnostic (XDM02) 180 NSF

a. Provide one per each [number of Diagnostic Mammography rooms]

Mammography may be separately provided in Women's Health Clinic if in clinic concept of operations, please refer to Chapter 360: Women's Health Clinic. While used frequently for breast exams for women, Mammography may also be used for screening male patients for breast cancer. Consideration should be paid to the location of Mammography services based on the beneficiary population being served.

10. Bone Densitometry (XDBD1) 100 NSF

a. Provide one per each [number of Bone Densitometry rooms]

Allocated NSF provides space for performing bone densitometry (DEXA) scan. This room may be separately provided in Nuclear Medicine or Women's Health Clinic.

11. General Purpose Ultrasound (XDUS1) 150 NSF

a. Provide one per each [number of General Purpose Ultrasound rooms]

12. Maternal/Fetal Ultrasound (XDUS1) 150 NSF

a. Provide one per each [number of Maternal/Fetal Ultrasound rooms]

13. OB/GYN Ultrasound (XDUS1) 150 NSF

a. Provide one per each [number of OB/GYN Ultrasound rooms]

14. Echocardiology Ultrasound (XDUS1) 150 NSF

a. Provide one per each [number of Echocardiology Ultrasound rooms]

15. Toilet, Ultrasound Patient (TLTU1) 60 NSF

a. Provide one per each [General Purpose Ultrasound (XDUS1)], [Maternal/Fetal Ultrasound (XDUS1)], [OB/GYN Ultrasound (XDUS1)], [Echocardiology Ultrasound (XDUS1)]

16. Toilet, Unisex (TLTU1) 60 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional one for every increment of eight [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] greater than eight

17. Cleaning Room, Transducer (USCL1) 90 NSF

a. Provide one if [General Purpose Ultrasound (XDUS1)], [Maternal/Fetal Ultrasound (XDUS1)], [OB/GYN Ultrasound (XDUS1)], [Echocardiology Ultrasound (XDUS1)] is at least one

5.3. FA3: COMPUTED TOMOGRAPHY (CT) PATIENT AREA.

FA Condition: [Is Computed Tomography (CT) services projected to support Radiology?]

1. Sub-Waiting (WRC03) 60 NSF

a. Provide one
b. Provide an additional 30 NSF per each [Scanning Room, Computed Tomography (CT) (XCTS1)] greater than two

Area dedicated to prepared patient waiting proximal to Computed Tomography (CT) Scanning Rooms (may be combined with Radiology sub-waiting).

2. Inpatient Holding (WRL01) 90 NSF

a. Provide one

3. Screening / Patient Prep (EXRG4) 120 NSF

a. Provide one

Dedicated to Point of Care blood testing and IV preparation, patient consult and venipuncture.

4. Cubicle, Patient Dressing (DR001) 50 NSF

a. Provide one
b. Provide an additional one for every increment of two [number of CT Scanning rooms] greater than two

Allocated NSF provides space for a seat or bench, mirror, locker for securing valuables and provisions for hanging patients' clothing. Cubicles should be provided convenient to the waiting areas and procedure room(s) and may be grouped together.

5. Toilet, Computed Tomography (CT) Patient (TLTU1) 60 NSF

a. Provide one

6. Medication Room (MEDP1) 100 NSF

a. Provide one if [Are Sedation services projected to support Radiology?]

Allocated NSF is provided for medication in support of moderate sedation / general anesthesia exams.

7. Prep / Recovery, Moderate Sedation (RROP1) 240 NSF

a. Provide one if [Are Sedation services projected to support Radiology?]

Allocated NSF may be combined with Inpatient Holding.

8. Nurse Station (NSTA3) 30 NSF

a. Provide one

9. Alcove, Blanket Warmer (RCA04) 15 NSF

a. Provide one

10. Scanning Room, Computed Tomography (CT) (XCTS1) 360 NSF

a. Provide one per each [number of CT Scanning rooms]

Due to specific functional and service clearances around the CT Scanner, room length, width, and height should be closely coordinated with siting requirements for CT scanner equipment. Coordinate siting considerations / magnetic field conflicts if located immediately adjacent to an MRI scanner.

11. Control Room, Computed Tomography (CT) (XCTC1) 100 NSF

a. Provide one per each [number of CT Scanning rooms]
b. Provide an additional one for every increment of two [Scanning Room, Computed Tomography (CT) (XCTS1)] greater than two

12. System Component Room, Computed Tomography (CT) (XCTC2) 90 NSF

a. Provide one per each [Scanning Room, Computed Tomography (CT) (XCTS1)]
b. Provide an additional 60 NSF if [Is Uninterrupted Power Supply (UPS) for the CT System Component Room projected to support Radiology services?]

Size, capacity, thermal load, and hazard issues with UPS may necessitate separate / larger area than indicated. Coordinate with design requirements.

13. Alcove, Clean Linen (LCCL3) 15 NSF

a. Provide one

14. Alcove, Soiled Linen (LCSL3) 15 NSF

a. Provide one

15. Alcove, Crash Cart (RCA01) 15 NSF

a. Provide one if [Are Sedation services projected to support Radiology?]

Locate this space near CT Scanning Room.

5.4. FA4: MAGNETIC RESONANCE IMAGING (MRI) PATIENT AREA.

FA Condition: [Is Magnetic Resonance Imaging (MRI) services projected to support Radiology?]

The Magnetic Resonance Imaging (MRI) Patient Area is zoned based on patient screening and access to MRI services. The Zones used in this document are Zone II, Zone III or Zone IV.

1. Sub-Waiting (WRC03) 60 NSF

a. Provide one
b. Provide an additional 30 NSF per each [Scanning, MRI (XMRS1)] greater than two

Patient waiting, holding, changing / gowning, and screening functions (areas in which a patient may interact with other persons who have not been successfully screened for MRI contraindications) are all Zone II functions within the Four Zone principle.

2. Inpatient Holding (WRL01) 90 NSF

a. Provide one if [Are inpatient services projected in the facility?]

This space is in Zone II.

3. Screening / Patient Prep (EXRG4) 120 NSF

a. Provide one

Dedicated to Point of Care blood testing, IV preparation, patient consult and venipuncture. This space is in Zone II.

4. Toilet, MRI Patient (TLTU1) 60 NSF

b. Provide one

This space is in Zone II.

5. Cubicle, Patient Dressing (DR001) 50 NSF

a. Provide one
b. Provide an additional one for every increment of two [Scanning, MRI (XMRS1)] greater than two

This space is in Zone II. Allocated NSF provides space for a seat or bench, mirror, locker for securing valuables and provisions for hanging patients' clothing. Cubicles should be provided convenient to the waiting areas and procedure room(s) and may be grouped together.

6. Medication Room (MEDP1) 100 NSF

a. Provide one if [Are Sedation services projected to support Radiology?]

Depending on the location within the MRI suite, where – operationally – screenings are conducted, location of secured access points, and access control protocols, the Medication Room, Moderate Sedation Prep / Recovery, Nurse Station, and Blanket Warmer Alcove could be located within either Zone II or Zone III.

7. Prep / Recovery, Moderate Sedation (RROP2) 240 NSF

a. Provide one if [Are Sedation services projected to support Radiology?]

Allocated NSF may be combined with Inpatient Holding. This space is in Zone II.

8. Nurse Station (NSTA3) 30 NSF

a. Provide one

This space is in Zone II.

9. Ferromagnetic Detection (XMRF1) 30 NSF

a. Provide one per each [Scanning, MRI (XMRS1)]

This space is in Zone III. Patients shall access the MRI Scanning Room(s) having first passed through this area.

10. Scanning, MRI (XMRS1) 480 NSF

a. Provide one per each [number of MRI Scanning rooms]

Due to specific functional and service clearances around the MRI scanner, room length, width, and height should be closely coordinated with siting requirements for MRI scanner equipment. It is preferable to increase the NSF of the MRI Scanning Room(s) if it eliminates the need for passive magnetic shielding in exam room walls. The MRI Scanning Room is, by definition, a Zone IV area (area in which the physical hazards are greatest).

11. Control Room, MRI (XMRC1) 150 NSF

a. Provide one
b. Provide an additional one for every increment of two [Scanning, MRI (XMRS1)] greater than two

This space can also be used as secured access vestibule for MRI Scanning Room. This space is in Zone III.

12. System Component Room, MRI (XMRC2) 180 NSF

a. Provide one per each [Scanning, MRI (XMRS1)]
b. Provide an additional 60 NSF if [Is Uninterrupted Power Supply (UPS) for the MRI System Component Room projected to support Radiology services?]

Depending on access pathway and magnetic field hazards, an MRI System Component Room may be a Zone II space.

13. Storage, MRI (SRS01) 100 NSF

a. Provide one

Dedicated storage for MRI consumables, equipment, and coils. This space is in Zone II.

14. Alcove, Clean Linen (LCCL3) 15 NSF

a. Provide one

This space is in Zone III.

15. Alcove, Soiled Linen (LCSL3) 15 NSF

a. Provide one

This space is in Zone III.

16. Alcove, Stretcher (SRLW2) 50 NSF

a. Provide one if [Are inpatient services projected in the facility?]

This space is in Zone II.

17. Alcove, Blanket Warmer (RCA04) 15 NSF

a. Provide one if [Are inpatient services projected in the facility?]

This space is in Zone II.

18. Alcove, Crash Cart (RCA01) 15 NSF

a. Provide one

Locate near MRI Scanning room / Inpatient Holding / Moderate Sedation Prep / Recovery Room. This space is in Zone III.

5.5. FA5: RADIOLOGY COMPUTED TOMOGRAPHY (CT) SIMULATION.

FA Condition: [Is a Computed Tomography (CT) Simulator projected to support Radiology?]

1. Scanning Room, Computed Tomography (CT) Simulator (XTSG1) 360 NSF

a. Provide one

2. Control Room, Computed Tomography (CT) Simulator (XTSC1) 100 NSF

a. Provide one

3. System Component, Computed Tomography (CT) Simulator (XTSC2) 90 NSF

a. Provide one

5.6. FA6: RADIOLOGY SUPPORT.

1. Utility Room, Clean (UCCL1) 100 NSF

a. Provide one if [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional one for every increment of eight [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] greater than sixteen

Allocated NSF may be subdivided for distributed storage of linens / supplies throughout Radiology / X-ray service area.

2. Utility Room, Soiled (USCL1) 90 NSF

a. Provide one if [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional one for every increment of sixteen [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] greater than sixteen

3. Storage, Equipment (SRSE1) 100 NSF

a. Provide one if [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional one for every increment of eight [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] greater than sixteen

4. Alcove, Blanket Warmer (RCA04) 15 NSF

a. Provide one if [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] is at least one

5. Alcove, Crash Cart (RCA01) 15 NSF

a. Provide one if [Total number of Radiology Rooms (including Computed Tomography (CT) or MRI Scanning)] is at least one

5.7. FA7: RADIOLOGY STAFF AND ADMINISTRATION.

If additional administrative spaces other than those listed in this Functional Area are required to support patient care, consider adding shared offices or cubicles, and include comments with justification in the PFD. Refer to Chapter 210: General Administration for administrative space criteria.

1. Office, Radiology Supervisor (OFA04) — 100 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one

2. Team Workroom (WKTM1) — 180 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one
b. Provide an additional 50 NSF per each [How many Radiology FTE positions are projected on peak shift per the authorized manning document?] greater than three

Accommodates one radiologist workspace at 50 NSF and two radiology tech hot desks at 15 NSF each, and a collaboration area. Adjust the size based on the number of FTE staff on the team during peak shift.

3. Copy / Office Supply (RPR01) — 50 NSF

a. Provide one if [Total number of Radiology Rooms (not including Computed Tomography (CT) or MRI Scanning)] is at least one

Planner must determine the availability and the volume of use of each Copy /Office Supply space within the specific service or the facility to share the function and optimize the space requirement for copy areas.

4. On-Call Room (DUTY1) — 100 NSF

a. Provide one if [Is an On-Call Room projected to support Radiology?]

5. Viewing Room, Picture Archiving and Communication System (PACS) (XVC01) — 100 NSF

a. Provide one if [Is a Picture Archiving and Communication System (PACS) Viewing Room within Radiology Staff and Administration projected to support Radiology services?]

SECTION 6: PROGRAM DATA REQUIRED: NUCLEAR MEDICINE

6.1. INPUT DATA STATEMENTS. Input Data Statements are based on questions about Workload (W), Mission (M), Staffing (S) and Miscellaneous (Misc) information.

1. Is Nuclear Medicine services projected in the facility? (M)
   1.1. How many annual Nuclear / Gamma Camera (Cardiac) encounters are projected? (W)
   1.2. How many annual Nuclear / Gamma Camera (Bone Scan) encounters are projected? (W)
   1.3. How many annual Nuclear / Gamma Camera (Full Scope) encounters are projected? (W)
   1.4. How many annual SPECT / CT encounters are projected? (W)
   1.5. How many annual PET / CT encounters are projected? (W)
2. Is Dose Storage / Calibration projected to be performed within the Hot Lab / Radiopharmacy? (M)
3. Is a Radiopharmaceutical Injection Room projected to support Nuclear Medicine? (M)
4. Is Uninterrupted Power Supply (UPS) in the SPECT / CT System Component Room projected to support Nuclear Medicine? (M)
5. Is Uninterrupted Power Supply (UPS) in the PET / CT System Component Room projected to support Nuclear Medicine? (M)
6. Is a Non-Sterile Compounding Room projected to support Nuclear Medicine? (M)
7. Is a Hot Lab / Radiopharmacy in the Nuclear Medicine Radiopharmacy Area projected? (M) (Note: An area dedicated to the safe storage and preparation of radiopharmaceuticals for use in nuclear medicine and / or radiation oncology areas.)

6.2. COMPUTED STATEMENTS.

1. Nuclear Medicine Room Utilization Factor (Computed) (Default: .80)
2. Nuclear Medicine Hours per day (Computed) (Default: 8)
3. Nuclear Medicine Days per year (Computed) (Default: 250)
4. Nuclear Medicine Patient care hours per year (Computed) (Default: [Nuclear Medicine Hours per day] x [Nuclear Medicine Days per year])
5. Nuclear / Gamma Camera (Cardiac) Scanning Average Length of Encounter (ALOE) in Hours (Computed) (Default: 1.0)
6. Nuclear / Gamma Camera (Bone Scan) Scanning Average Length of Encounter (ALOE) in Hours (Computed) (Default: .75)
7. Nuclear / Gamma Camera (Full Scope) Scanning Average Length of Encounter (ALOE) in Hours (Computed) (Default: 1.67)
8. SPECT / CT Scanning Average Length of Encounter (ALOE) in Hours (Computed) (Default: 1.0)
9. PET / CT Scanning Average Length of Encounter (ALOE) in Hours (Computed) (Default: .75)
10. Nuclear / Gamma Camera (Cardiac) Scanning Workload Capacity (Computed) (Default: ([Nuclear Medicine Room Utilization Factor] x [Nuclear Medicine Patient care hours per year]) / [Nuclear / Gamma Camera (Cardiac) Scanning Average Length of Encounter (ALOE) in Hours])
11. Calculated number of Nuclear / Gamma Camera (Cardiac) Scanning rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Nuclear / Gamma

Camera (Cardiac) encounters are projected?] / [Nuclear / Gamma Camera (Cardiac) Scanning Workload Capacity]))

12. Nuclear / Gamma Camera (Bone Scan) Scanning Workload Capacity (Computed) (Default: ([Nuclear Medicine Room Utilization Factor] x [Nuclear Medicine Patient care hours per year]) / [Nuclear / Gamma Camera (Bone Scan) Scanning Average Length of Encounter (ALOE) in Hours])
13. Calculated number of Nuclear / Gamma Camera (Bone Scan) Scanning rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Nuclear / Gamma Camera (Bone Scan) encounters are projected?] / [Nuclear / Gamma Camera (Bone Scan) Scanning Workload Capacity]))
14. Nuclear / Gamma Camera (Full Scope) Scanning Workload Capacity (Computed) (Default: ([Nuclear Medicine Room Utilization Factor] x [Nuclear Medicine Patient care hours per year]) / [Nuclear / Gamma Camera (Full Scope) Scanning Average Length of Encounter (ALOE) in Hours])
15. Calculated number of Nuclear / Gamma Camera (Full Scope) Scanning rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Nuclear / Gamma Camera (Full Scope) encounters are projected?] / [Nuclear / Gamma Camera (Full Scope) Scanning Workload Capacity]))
16. SPECT / CT Scanning Workload Capacity (Computed) (Default: ([Nuclear Medicine Room Utilization Factor] x [Nuclear Medicine Patient care hours per year]) / [SPECT / CT Scanning Average Length of Encounter (ALOE) in Hours])
17. Calculated number of SPECT / CT Scanning rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual SPECT / CT encounters are projected?] / [SPECT / CT Scanning Workload Capacity]))
18. PET / CT Scanning Workload Capacity (Computed) (Default: ([Nuclear Medicine Room Utilization Factor] x [Nuclear Medicine Patient care hours per year]) / [PET / CT Scanning Average Length of Encounter (ALOE) in Hours])
19. Calculated number of PET / CT Scanning rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual PET / CT encounters are projected?] / [PET / CT Scanning Workload Capacity]))
20. Total number of Nuclear Medicine Rooms (Computed) (Default: [Scanning, Nuclear / Gamma Camera (NMGS1)], [Scanning, SPECT / CT (XCTS1)], [Scanning, PET / CT (XCTS1)])

6.3. SHORTCUTS.

1. number of Nuclear / Gamma Camera (Cardiac) Scanning rooms: [Calculated number of Nuclear / Gamma Camera (Cardiac) Scanning rooms based on workload]
2. number of Nuclear / Gamma Camera (Bone Scan) Scanning rooms: [Calculated number of Nuclear / Gamma Camera (Bone Scan) Scanning rooms based on workload]
3. number of Nuclear / Gamma Camera (Full Scope) Scanning rooms: [Calculated number of Nuclear / Gamma Camera (Full Scope) Scanning rooms based on workload]
4. number of SPECT / CT Scanning rooms: [Calculated number of SPECT / CT Scanning rooms based on workload]

5. number of PET / CT Scanning rooms: [Calculated number of PET / CT Scanning rooms based on workload]

SECTION 7: SPACE PLANNING CRITERIA: NUCLEAR MEDICINE

For calculation of the number of building support spaces (Vestibules, Lobbies, Vending Machine areas, Multi-fixture Public and Staff Toilets, Staff Lounges and Locker Rooms, Conference Rooms, Security Services, Communication Closets, and Janitor Closets), please refer to Chapter 610: Common Areas.

7.1. FA1: NUCLEAR MEDICINE RECEPTION.

FA Condition: [Is Nuclear Medicine services projected in the facility?]

1. Waiting (WRC01) 120 NSF

a. Provide one
b. Provide an additional 60 NSF for every increment of four [Total number of Nuclear Medicine Rooms] greater than four

2. Kiosk, Patient Check-in (CLSC1) 15 NSF

a. Provide one
b. Provide an additional one for every increment of eight [Total number of Nuclear Medicine Rooms] greater than sixteen

Allocated NSF accommodates two check-in terminals.

3. Reception (RECP1) 100 NSF

a. Provide one
b. Provide an additional 50 NSF for every increment of eight [Total number of Nuclear Medicine Rooms] greater than sixteen

Allocated NSF accommodates two FTES.

7.2. FA2: NUCLEAR MEDICINE PATIENT AREA.

FA Condition: [Is Nuclear Medicine services projected in the facility?]

1. Sub-Waiting (WRC03) 60 NSF

a. Provide one

2. Toilet, Patient (TLTU1) 60 NSF

a. Provide one

3. Inpatient Holding (WRL01) 90 NSF

a. Provide one

4. Consult Room (EXR10) 120 NSF

a. Provide one
b. Provide an additional one for every increment of eight [Scanning, Nuclear / Gamma Camera (NMGS1)] greater than eight

5. Cubicle, Patient Dressing (DR001) 50 NSF

a. Provide one
b. Provide an additional one for every increment of two [Total number of Nuclear Medicine Rooms] greater than two

Allocated NSF provides space for a seat or bench, mirror, locker for securing valuables and provisions for hanging patients' clothing. Cubicles should be provided convenient to the waiting areas and procedure room(s) and may be grouped together.

6. Alcove, Wheelchair (SRLW1) 15 NSF

a. Provide one
b. Provide an additional one for every increment of sixteen [Total number of Nuclear Medicine Rooms] greater than sixteen

7. Alcove, Stretcher (SRLW2) 50 NSF

a. Provide one if [Total number of Nuclear Medicine Rooms] is at least one

8. Scanning, Nuclear / Gamma Camera (NMGS1) 380 NSF

a. Provide one per each [number of Nuclear / Gamma Camera (Cardiac) Scanning rooms], [number of Nuclear / Gamma Camera (Bone Scan) Scanning rooms], [number of Nuclear / Gamma Camera (Full Scope) Scanning rooms]

Due to specific functional and service clearances around the Nuclear / Gamma Camera, room length, width, and height should be closely coordinated with siting requirements for Nuclear / Gamma Camera equipment.

9. Testing / Treadmill (OPTM1) 175 NSF

a. Provide one per each [number of Nuclear / Gamma Camera (Cardiac) Scanning rooms]

Collocate directly adjacent / proximal to SPECT / CT or Nuclear / Gamma Camera (Cardiac) Scanning Room.

10. Radiopharmaceutical Injection (NMIR1) 150 NSF

a. Provide one if [Is a Radiopharmaceutical Injection Room projected to support Nuclear Medicine?]

11. Dose Storage / Calibration (NMDC1) 120 NSF

a. Provide one if [Is Dose Storage / Calibration projected to be performed within the Hot Lab / Radiopharmacy?]

12. Scanning, SPECT / CT (XCTS1) 360 NSF

a. Provide one per each [number of SPECT / CT Scanning rooms]

Due to specific functional and service clearances around the SPECT / CT scanner, room length, width, and height should be closely coordinated with siting requirements for SPECT / CT scanner. This NSF is based on non-interventional use of the room; interventional or high acuity uses may need additional NSF.

13. Control Room, SPECT / CT (XPCC1) 120 NSF

a. Provide one per each [Scanning, SPECT / CT (XCTS1)]

14. System Component, SPECT / CT (XPCC2) 90 NSF

a. Provide one per each [Scanning, SPECT / CT (XCTS1)]
b. Provide an additional 60 NSF if [Is Uninterrupted Power Supply (UPS) in the SPECT / CT System Component Room projected to support Nuclear Medicine?]

Size, capacity, thermal load, and hazard issues with UPS may necessitate separate / larger area than indicated. Coordinate with design requirements.

15. Injection / Uptake, PET / CT (NMIR1) 120 NSF

a. Provide three per each [Scanning, PET / CT (XCTS1)]

Three per PET / CT Scanning Room (requires greater shielding from the SPECT CT). Patient spends about 45 minutes here prior to the exam. May also be additional equipment storage in this room.

16. Scanning, PET / CT (XCTS1) 360 NSF

a. Provide one per each [number of PET / CT Scanning rooms]

Due to specific functional and service clearances around the PET / CT scanner, room length, width, and height should be closely coordinated with siting requirements for PET / CT scanner.

17. Control Room, PET / CT (XPCC1) 120 NSF

a. Provide one per each [Scanning, PET / CT (XCTS1)]

18. System Component, PET / CT (XPCC2) 90 NSF

a. Provide one per each [Scanning, PET / CT (XCTS1)]
b. Provide an additional 60 NSF if [Is Uninterrupted Power Supply (UPS) in the PET / CT System Component Room projected to support Nuclear Medicine?]

Size, capacity, thermal load, and hazard issues with UPS may necessitate separate / larger area than indicated. Coordinate with design requirements.

19. Thyroid Probe Uptake (NMUR1) 120 NSF

a. Provide one

20. Sub-Waiting, Hot / Cool Down (NMWR1) 120 NSF

a. Provide one if [Scanning, Nuclear / Gamma Camera (NMGS1)] is at least one
b. Provide an additional one for every increment of three [Scanning, Nuclear / Gamma Camera (NMGS1)] greater than three

21. Toilet, Hot (TLTU1) 60 NSF

a. Provide one per each [Sub-Waiting, Hot / Cool Down (NMWR1)]

7.3. FA3: NUCLEAR MEDICINE RADIOPHARMACY.

FA Condition: [Is Nuclear Medicine services projected in the facility?]

1. Vestibule, Radiopharmacy (NMVC1) 90 NSF

a. Provide one if [Total number of Nuclear Medicine Rooms] is at least one

Air lock, sally-port mechanism. Access form the Vestibule shall be provided to each of the following rooms: Non-Sterile Compounding Room, Hot Lab / Radiopharmacy Anteroom, Receiving / Storage Radiopharmacy, and Decay Storage. Please refer to each room for additional comments.

2. Non-Sterile Compounding (NMPC1) 90 NSF

a. Provide one if [Is a Non-Sterile Compounding Room projected to support Nuclear Medicine?]

Space provided for Pharmaceutical Compounding Non-Sterile Preparations per USP 795.

3. Anteroom, Hot Lab / Radiopharmacy (NMLA1) 120 NSF

a. Provide one per each [Hot Lab / Radiopharmacy (NMRP1)]

ISO Class 8 (or better) area for hand hygiene, garbing procedures, order entry, labeling of compounded sterile products and perform other high-particulate generating activities. Anteroom provides access to Hot Lab / Radiopharmacy.

4. Receiving / Decay Storage Radiopharmacy (NMDS1) 120 NSF

a. Provide one if [Is a Hot Lab / Radiopharmacy in the Nuclear Medicine Radiopharmacy Area projected?]
b. Provide an additional 30 NSF for every increment of two [Total number of Nuclear Medicine Rooms] greater than four

This room requires Ionizing Radiation shielding.

5. Hot Lab / Radiopharmacy (NMRP1) 240 NSF

a. Provide one if [Is a Hot Lab / Radiopharmacy in the Nuclear Medicine Radiopharmacy Area projected?]
b. Provide an additional 90 NSF if [Is Dose Storage / Calibration projected to be performed within the Hot Lab / Radiopharmacy?]

6. Blood Product Compounding (NMBP1) 90 NSF

a. Provide one if [Is a Hot Lab / Radiopharmacy in the Nuclear Medicine Radiopharmacy Area projected?]

For blood cell tagging; per ISO 7 and USP 797 requirement. This space shall be accessed exclusively from Hot Lab / Radiopharmacy.

7.4. FA4: NUCLEAR MEDICINE SUPPORT.

FA Condition: [Is Nuclear Medicine services projected in the facility?]

1. Storage, Equipment (SRSE1) 100 NSF

a. Provide one
b. Provide an additional 30 NSF for every increment of eight [Total number of Nuclear Medicine Rooms] greater than eight

2. Alcove, Clean Linen (LCCL3) 15 NSF

a. Provide one if [Total number of Nuclear Medicine Rooms] is at least one

3. Alcove, Soiled Linen (LCSL3) 15 NSF

a. Provide one if [Total number of Nuclear Medicine Rooms] is at least one

4. Alcove, Crash Cart (RCA01) 15 NSF

a. Provide one if [Total number of Nuclear Medicine Rooms] is at least one

5. Alcove, Blanket Warmer (RCA04) 15 NSF

a. Provide one if [Total number of Nuclear Medicine Rooms] is at least one

6. Group Viewing / Reading (XVC01) 100 NSF

a. Provide one if [Scanning, Nuclear / Gamma Camera (NMGS1)], [Scanning, SPECT / CT (XCTS1)] is at least one
b. Provide an additional 100 NSF if [Scanning, Nuclear / Gamma Camera (NMGS1)], [Scanning, SPECT / CT (XCTS1)] is greater than three

This space shall be shared by all Nuclear Medicine services except PET / CT.

7. PET / CT Viewing / Reading (XVC01) 100 NSF

a. Provide one if [Scanning, PET / CT (XCTS1)] is at least one

7.5. FA5: NUCLEAR MEDICINE STAFF AND ADMINISTRATION.

FA Condition: [Is Nuclear Medicine services projected in the facility?]

If additional administrative spaces other than those listed in this Functional Area are required to support patient care, consider adding shared offices or cubicles, and include comments with justification in the PFD. Refer to Chapter 210: General Administration for administrative space criteria.

1. Office, Nuclear Medicine Supervisor (OFA04) 100 NSF

a. Provide one

2. Team Workroom (WKTM1) 380 NSF

a. Provide one

b. Provide an additional one for every increment of eight [Total number of Nuclear Medicine Rooms] greater than eight

Accommodates two providers and one RN workspace at 50 NSF each, four LPN workspaces and two shared hot desks for techs/medics at 30 NSF each, and a collaboration area. Adjust the size based on the number of providers and support staff on the team. The planner must determine whether each type of specialty will have a dedicated team workroom or if specialties with fewer staff members can be combined in one team workroom with other specialty staff.

3. Copy / Office Supplies (RPR01) 50 NSF

a. Provide one

Planner must determine the availability and the volume of use of each Copy /Office Supply space within the specific service or the facility to share the function and optimize the space requirement for copy areas.

SECTION 8: PROGRAM DATA REQUIRED: RADIATION ONCOLOGY

8.1. INPUT DATA STATEMENTS. Input Data Statements are based on questions about Workload (W), Mission (M), Staffing (S) and Miscellaneous (Misc) information.

1. Is Radiation Oncology services projected in the facility? (M)
2. Is a Radiation Oncology Beam Patient Area projected in the facility? (M)
3. Is a Block Preparation / Storage projected in the Radiation Oncology Beam Patient Area? (M)
4. Is a Radiation Oncology Isotope Patient Area projected in Radiation Oncology? (M)
5. Is an HDR Brachytherapy Procedure Room projected in the facility? (M)
6. Is a Computed Tomography (CT) Simulator projected to support Radiation Oncology? (M)
   6.1. Is an Uninterrupted Power Supply (UPS) for the CT Simulator System Component Room projected to support Radiation Oncology? (M)
7. How many annual Single-Axis Linear Accelerator encounters are projected? (W)

8.2. COMPUTED STATEMENTS.

1. Radiation Oncology Room Utilization Factor (Computed) (Default: .80)
2. Radiation Oncology Hours per day (Computed) (Default: 8)
3. Radiation Oncology Days per year (Computed) (Default: 250)
4. Radiation Oncology Patient care hours per year (Computed) (Default: [Radiation Oncology Hours per day] x [Radiation Oncology Days per year])
5. Single-Axis Linear Accelerator Average Length of Encounter (ALOE) in Hours (Computed) (Default: 0.5)
6. Single-Axis Linear Accelerator Workload Capacity (Computed) (Default: ([Radiation Oncology Room Utilization Factor] x [Radiation Oncology Patient care hours per year]) / [Single-Axis Linear Accelerator Average Length of Encounter (ALOE) in Hours])
7. Calculated number of Single-Axis Linear Accelerator rooms based on workload (Computed) (Default: Round Up From (.25, [How many annual Single-Axis Linear Accelerator encounters are projected?] / [Single-Axis Linear Accelerator Workload Capacity]))

8.3. SHORTCUTS.

1. number of Single-Axis Linear Accelerator rooms: [Calculated number of Single-Axis Linear Accelerator rooms based on workload]

SECTION 9: SPACE PLANNING CRITERIA: RADIATION ONCOLOGY

For calculation of the number of building support spaces (Vestibules, Lobbies, Vending Machine areas, Multi-fixture Public and Staff Toilets, Staff Lounges and Locker Rooms, Conference Rooms, Security Services, Communication Closets, and Janitor Closets), please refer to Chapter 610: Common Areas.

9.1. FA1: RADIATION ONCOLOGY RECEPTION.

FA Condition: [Is Radiation Oncology services projected in the facility?]

1. Waiting (WRC01) 240 NSF

a. Provide one
b. Provide an additional 64 NSF for every increment of two [number of Single-Axis Linear Accelerator rooms] greater than eight

2. Kiosk, Patient Check-in (CLSC1) 15 NSF

a. Provide one
b. Provide an additional one for every increment of eight [number of Single-Axis Linear Accelerator rooms] greater than sixteen

3. Reception (RECP1) 100 NSF

a. Provide one
c. Provide an additional 50 NSF for every increment of eight [number of Single-Axis Linear Accelerator rooms] greater than sixteen

9.2. FA2: RADIATION ONCOLOGY BEAM PATIENT AREA.

FA Condition: [Is Radiation Oncology services projected in the facility?] and [Is a Radiation Oncology Beam Patient Area projected in the facility?]

1. Sub-Waiting (WRC03) 60 NSF

a. Provide one
b. Provide an additional 30 NSF for each [Linear Accelerator (Single-Axis) Vault (XTLA1)] greater than two

Area dedicated to prepared patient waiting near Beam Therapy rooms.

2. Inpatient Holding (WRL01) 90 NSF

a. Provide one if [Are inpatient services projected in the facility?]

3. Cubicle, Patient Dressing (DR001) 50 NSF

a. Provide one
b. Provide an additional one for every increment of two [Linear Accelerator (Single-Axis) Vault (XTLA1)] greater than two

Allocated NSF provides space for a seat or bench, mirror, locker for securing valuables and provisions for hanging patients' clothing. Cubicles should be provided convenient to the waiting areas and procedure room(s) and may be grouped together.

4. Alcove, Stretcher (SRLW2) 50 NSF

a. Provide one

5. Exam Room, Radiation Oncology Beam (EXRG1) 120 NSF

a. Provide three
b. Provide an additional two per each [Linear Accelerator (Single-Axis) Vault (XTLA1)] greater than one

6. Consult Room (OFDC2) 120 NSF

a. Provide one

7. Linear Accelerator (Single-Axis) Vault (XTLA1) 1,200 NSF

a. Provide one per each [number of Single-Axis Linear Accelerator rooms]

Allocated NSF includes NSF for the Maze Entrance and may need to be increased if vault is to serve High Dose Rate (HDR) brachytherapy procedures. Coordinate functional program requirements and includes maze entrance. Refer to vendor siting requirements. Anticipate future equipment replacements / upgrades when sizing maze entrance clear widths.

8. Control Room, Linear Accelerator (XTLC1) 120 NSF

a. Provide one per each [Linear Accelerator (Single-Axis) Vault (XTLA1)]

9. System Component, Linear Accelerator (XTLE1) 90 NSF

a. Provide one per each [Linear Accelerator (Single-Axis) Vault (XTLA1)]

10. Immobilizer Preparation / Storage (XTMF1) 100 NSF

a. Provide one if [number of Single-Axis Linear Accelerator rooms] is at least one

Space to create anatomy specific immobilizers for the patient.

11. Block Preparation / Storage (XTMF1) 100 NSF

a. Provide one if [Is a Block Preparation / Storage projected in the Radiation Oncology Beam Patient Area?]

Space for machining metal blocks for beam therapy and associated storage.

12. Storage, Beam Therapy (SRE01) 100 NSF

a. Provide one
b. Provide an additional 30 NSF for every increment of two [Linear Accelerator (Single-Axis) Vault (XTLA1)] greater than two

9.3. FA3: RADIATION ONCOLOGY COMPUTED TOMOGRAPHY (CT) SIMULATION.

FA Condition: [Is Radiation Oncology services projected in the facility?] and [Is a Computed Tomography (CT) Simulator projected to support Radiation Oncology?]

1. Scanning Room, Computed Tomography (CT) Simulator (XTSG1) 360 NSF

a. Provide one

2. Control Room, Computed Tomography (CT) Simulator (XTSC1) 100 NSF

a. Provide one

3. System Component, Computed Tomography (CT) (XTSC2) 90 NSF

a. Provide one
b. Provide an additional 60 NSF if [Is an Uninterrupted Power Supply (UPS) for the CT Simulator System Component Room projected to support Radiation Oncology?]

9.4. FA4: RADIATION ONCOLOGY ISOTOPE PATIENT AREA.

FA Condition: [Is Radiation Oncology services projected in the facility?]

1. Sub-Waiting (NMWR1) 60 NSF

a. Provide one if [Is a Radiation Oncology Isotope Patient Area projected in Radiation Oncology?]

Area dedicated to prepared patient waiting near Beam Therapy rooms.

2. Inpatient Holding (WRL01) 90 NSF

a. Provide one if [Are inpatient services projected in the facility?]

3. Screening / Patient Prep (EXRG4) 120 NSF

a. Provide one
b. Provide an additional one for every increment of eight [number of Single-Axis Linear Accelerator rooms] greater than eight

Dedicated to Point of Care blood testing and IV preparation, patient consult, venipuncture.

4. Cubicle, Patient Dressing (DR001) 50 NSF

a. Provide one
b. Provide an additional one for every increment of two [Procedure Room, HDR Brachytherapy (XTBT1)] greater than two

5. Alcove, Stretcher (SRLW2) 50 NSF

a. Provide one if [Is a Radiation Oncology Isotope Patient Area projected in Radiation Oncology?]

6. Exam Room, Radiation Oncology Isotope (EXRG1) 120 NSF

a. Provide one

7. Consult Room (OFDC2) 120 NSF

a. Provide one if [Is a Radiation Oncology Isotope Patient Area projected in Radiation Oncology?]

8. Procedure Room, HDR Brachytherapy (XTBT1) 180 NSF

a. Provide one if [Is an HDR Brachytherapy Procedure Room projected in the facility?]

9. Control Room, Brachytherapy (XTBC1) 150 NSF

a. Provide one per each [Procedure Room, HDR Brachytherapy (XTBT1)]

10. Storage, Isotope / HDR (NMDC1) 120 NSF

a. Provide one if [Procedure Room, HDR Brachytherapy (XTBT1)] is at least one

Allocated NSF accommodates the secure HDR unit storage, non-HDR radioactive isotope storage and decay storage.

11. Toilet, Unisex (TLTU1) 60 NSF

a. Provide one

9.5. FA5: RADIATION ONCOLOGY SUPPORT.

FA Condition: [Is Radiation Oncology services projected in the facility?]

1. Utility Room, Clean (UCCL1) 100 NSF

a. Provide one
b. Provide an additional one for every increment of eight [number of Single-Axis Linear Accelerator rooms] greater than eight

2. Utility Room, Soiled (USCL1) 90 NSF

a. Provide one
b. Provide an additional one for every increment of sixteen [number of Single-Axis Linear Accelerator rooms] greater than sixteen

3. Storage, Equipment (SRE01) 100 NSF

a. Provide one
b. Provide an additional 30 NSF for every increment of two [[number of Single-Axis Linear Accelerator rooms] greater than two

4. Alcove, Wheelchair (SRLW1) 15 NSF

a. Provide one

5. Work Area, Dosimetry / Treatment Planning (XTTP1) 240 NSF

a. Provide one if [Linear Accelerator (Single-Axis) Vault (XTLA1)] is at least one

This space is a collaborative work area for treatment planning.

6. Workroom, Physics (XTLB1) 240 NSF

a. Provide one if [Linear Accelerator (Single-Axis) Vault (XTLA1)], [Procedure Room, HDR Brachytherapy (XTBT1)] is at least one

This room provides additional space for radiation physicists to perform special planning and calibration work for Linear Accelerators and Brachytherapy cases.

9.6. FA6: RADIATION ONCOLOGY STAFF AND ADMINISTRATION.

FA Condition: [Is Radiation Oncology services projected in the facility?]

If additional administrative spaces other than those listed in this Functional Area are required to support patient care, consider adding shared offices or cubicles, and include comments with justification in the PFD. Refer to Chapter 210: General Administration for administrative space criteria.

1. Office, Radiation Oncology Supervisor (OFA04) 100 NSF

a. Provide one

2. Team Workroom (WKTM1) 380 NSF

a. Provide one
b. Provide an additional one for every increment of eight [number of Single-Axis Linear Accelerator rooms] greater than eight

Accommodates two providers and one RN workspaces at 50 NSF each, four LPN workspaces and two shared hot desks for techs/medics at 30 NSF each, and a collaboration area. Adjust the size based on the number of providers and support staff on the team. The planner must determine whether each type of specialty will have a dedicated team workroom or if specialties with fewer staff members can be combined in one team workroom with other specialty staff.

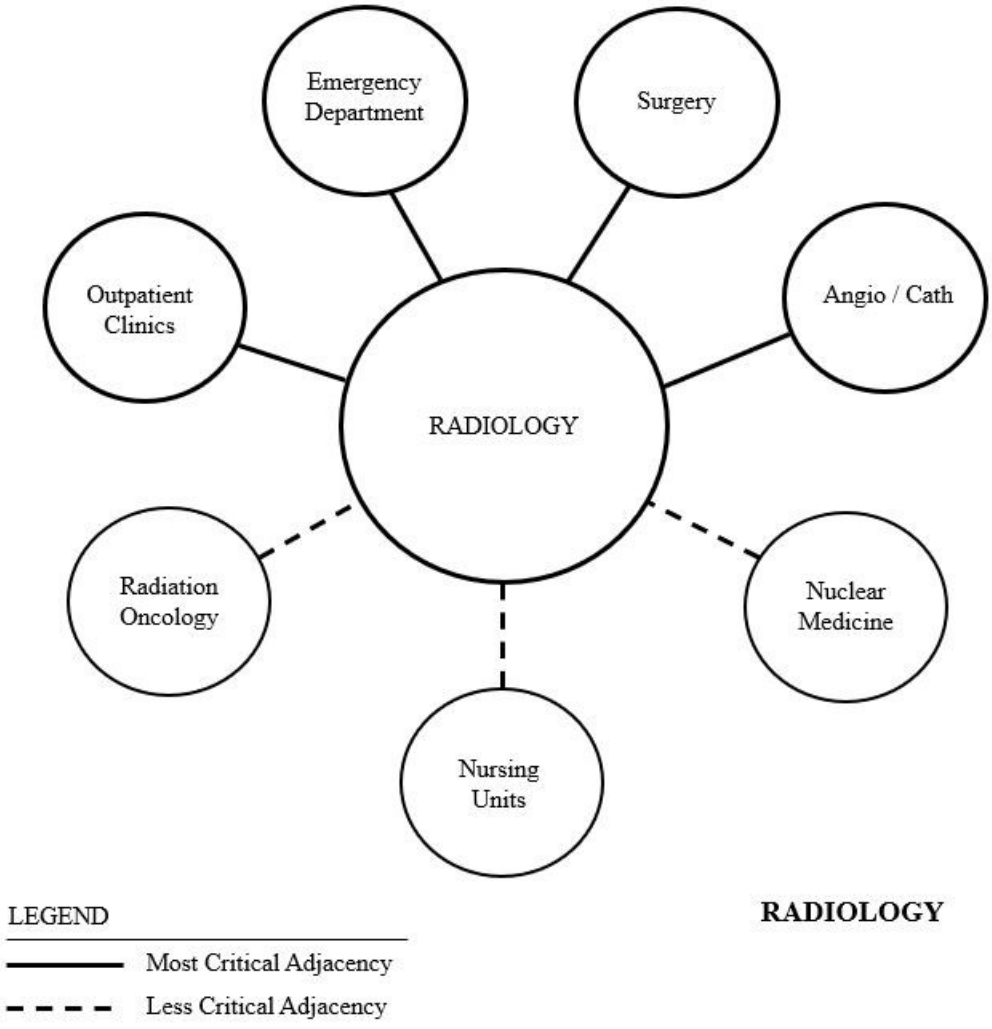
3. Copy / Office Supplies (RPR01) 50 NSF

a. Provide one

Planner must determine the availability and the volume of use of each Copy /Office Supply space within the specific service or the facility to share the function and optimize the space requirement for copy areas.

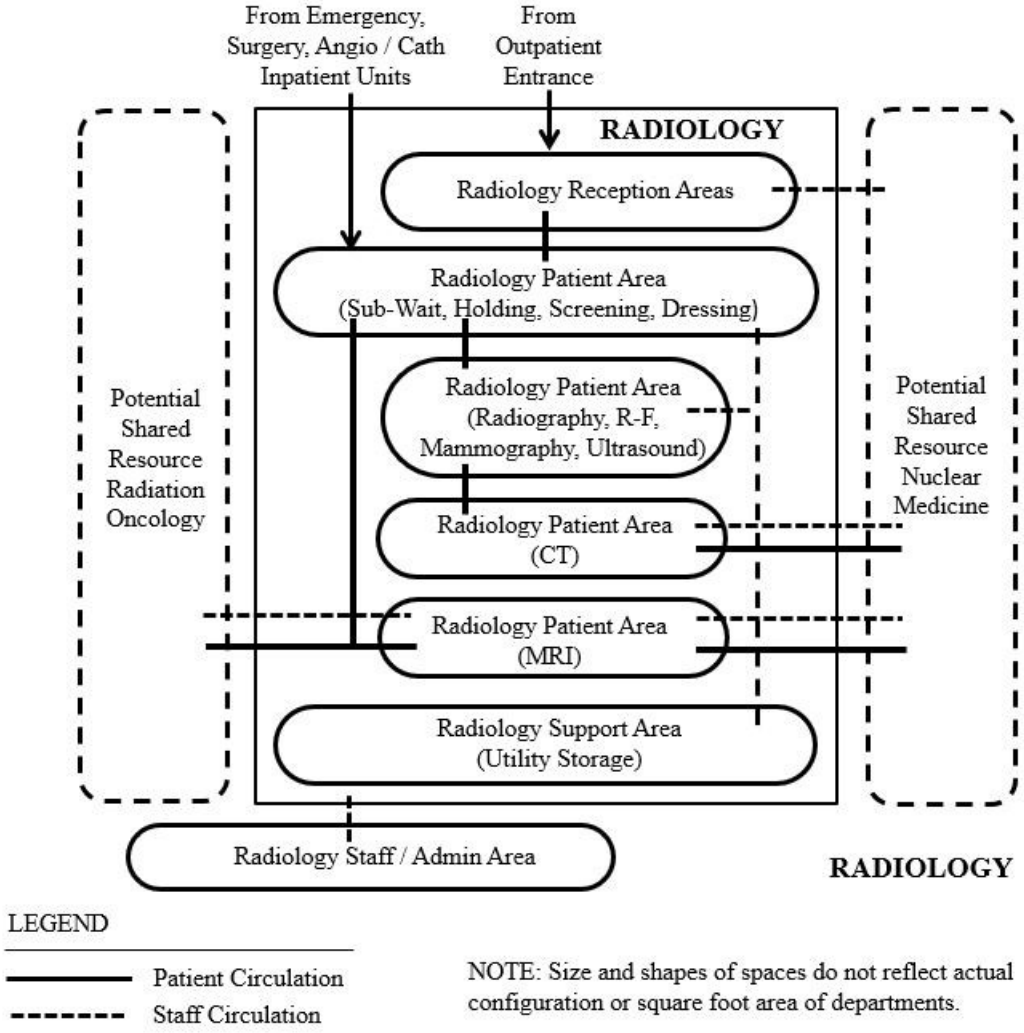
SECTION 10: FUNCTIONAL RELATIONSHIP (INTERDEPARTMENTAL): RADIOLOGY

The Radiology Services will rely on several other services in the MTF for patient care and support functions. The diagram below represents desirable relationships based on efficiency and functional considerations.



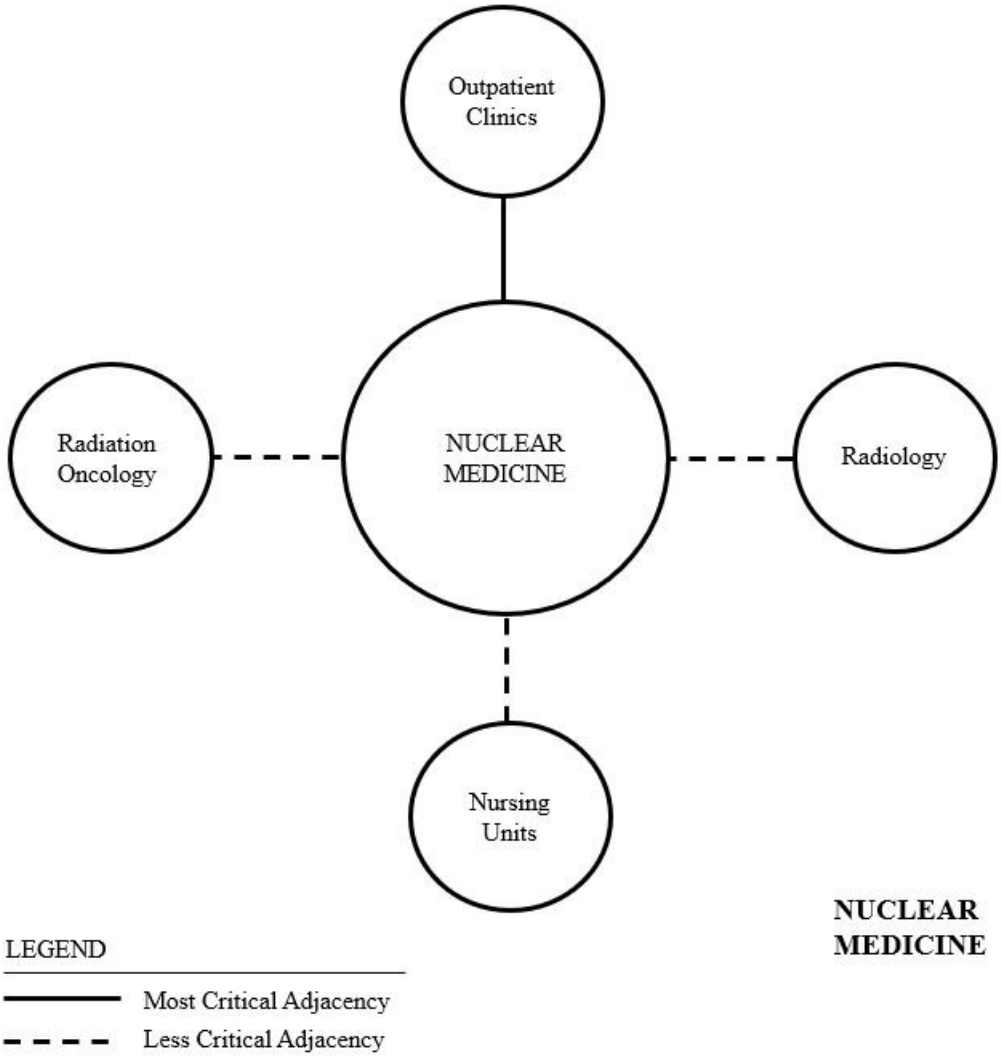
SECTION 11: FUNCTIONAL DIAGRAM (INTRADEPARTMENTAL): RADIOLOGY

The diagram below illustrates intradepartmental relationships among key areas / spaces within Radiology. The diagram is necessarily generic. The planner shall use this as a basis for design only and shall consider project-specific requirements for each MTF.



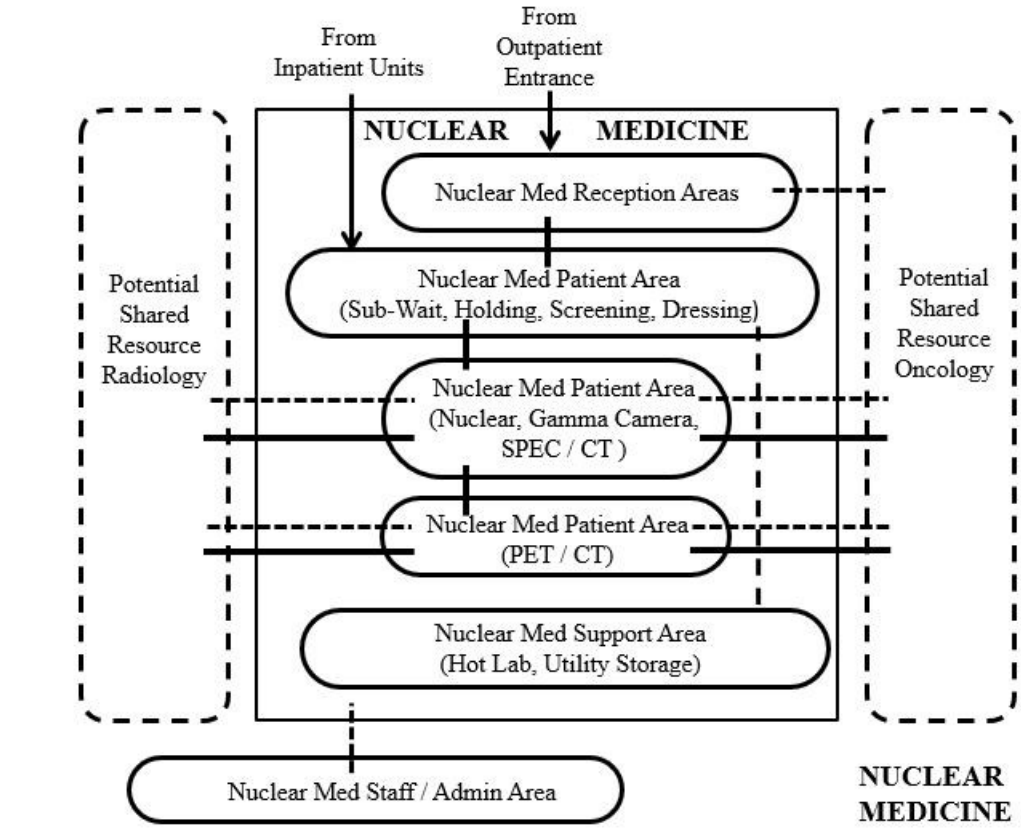
SECTION 12: FUNCTIONAL RELATIONSHIP (INTERDEPARTMENTAL): NUCLEAR MEDICINE

The Nuclear Medicine will rely on several other services in the MTF for patient care and support functions. The diagram below represents desirable relationships based on efficiency and functional considerations.



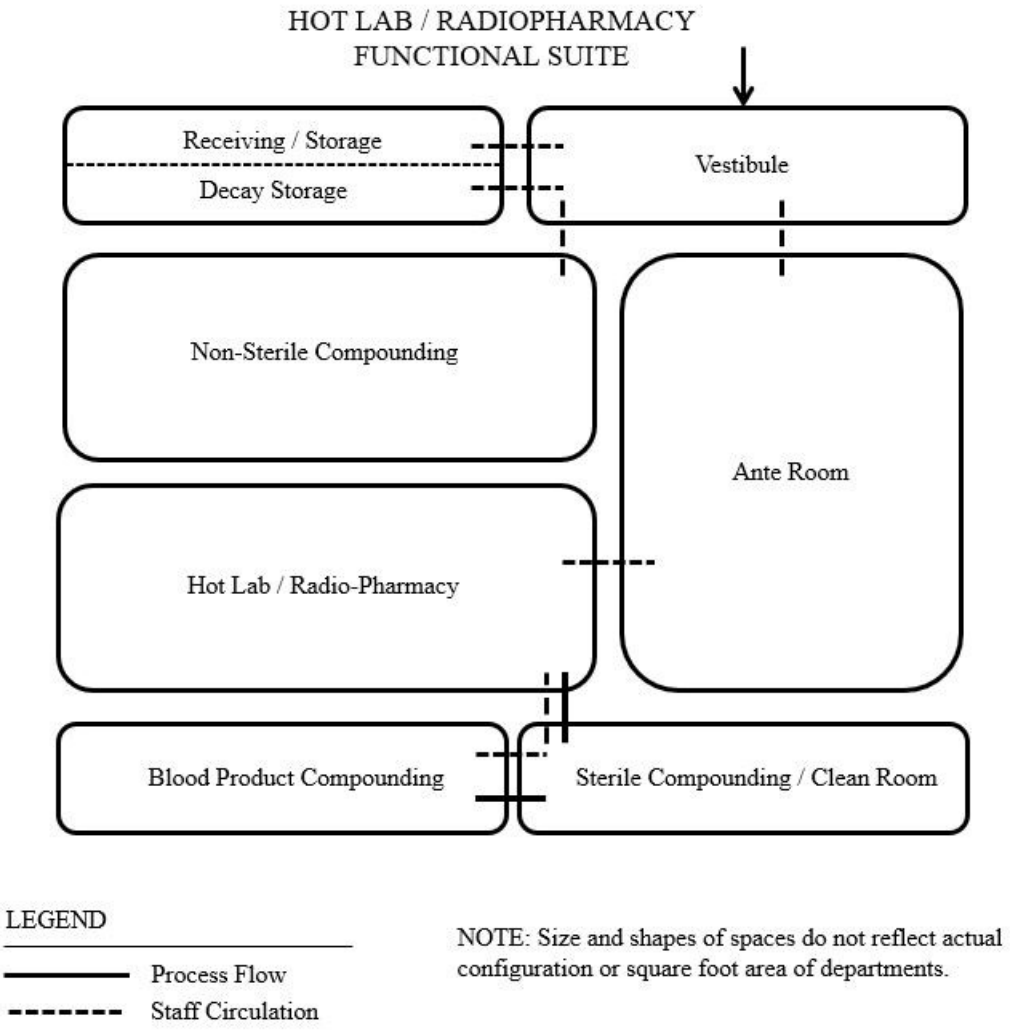
SECTION 13: FUNCTIONAL DIAGRAM (INTRADEPARTMENTAL): NUCLEAR MEDICINE

The diagram below illustrates intradepartmental relationships among key areas / spaces within Nuclear Medicine. The diagram is necessarily generic. The planner shall use this as a basis for design only and shall consider project-specific requirements for each MTF.



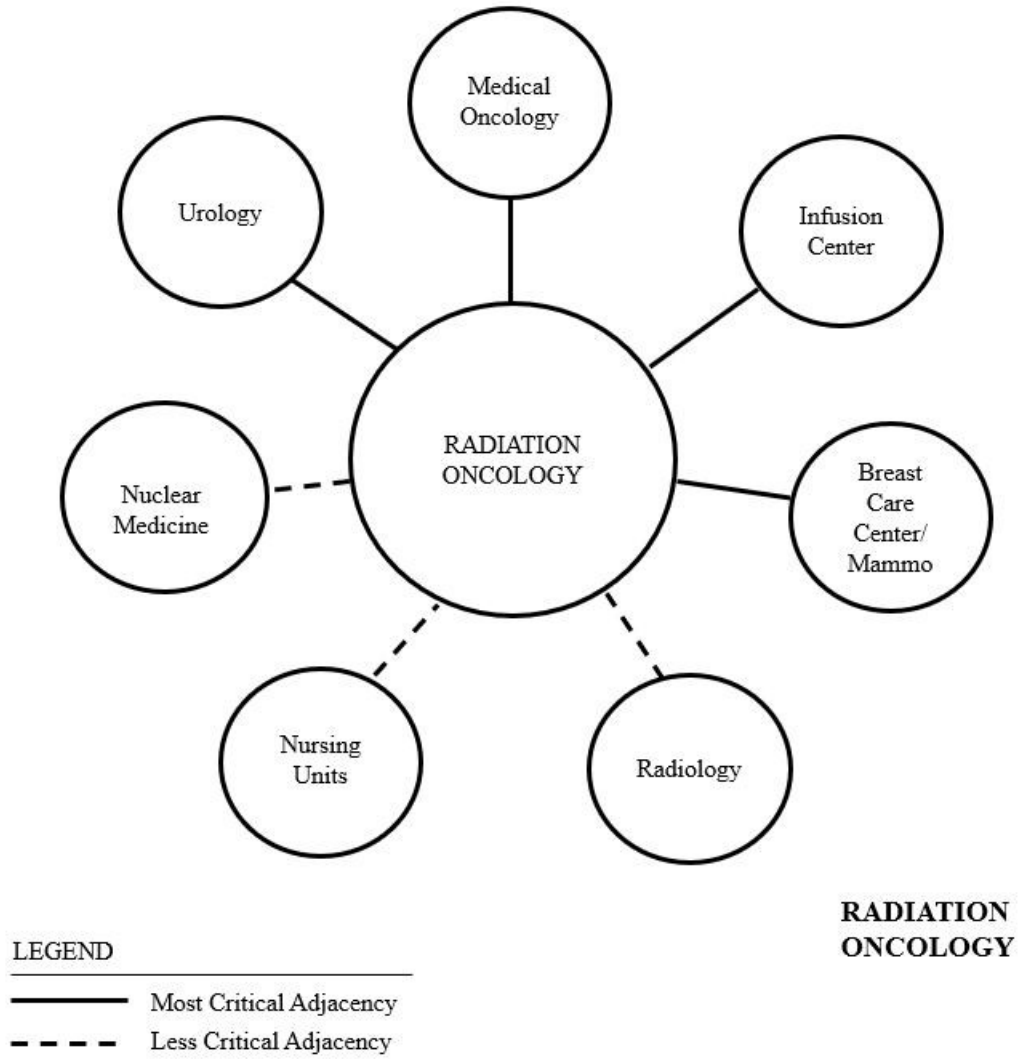
SECTION 14: FUNCTIONAL DIAGRAM (INTRADEPARTMENTAL): HOT LAB SUITE

The diagram below illustrates intradepartmental relationships among key areas / spaces within the Hot Lab Suite. The diagram is necessarily generic. The planner shall use this as a basis for design only and shall consider project-specific requirements for each MTF.



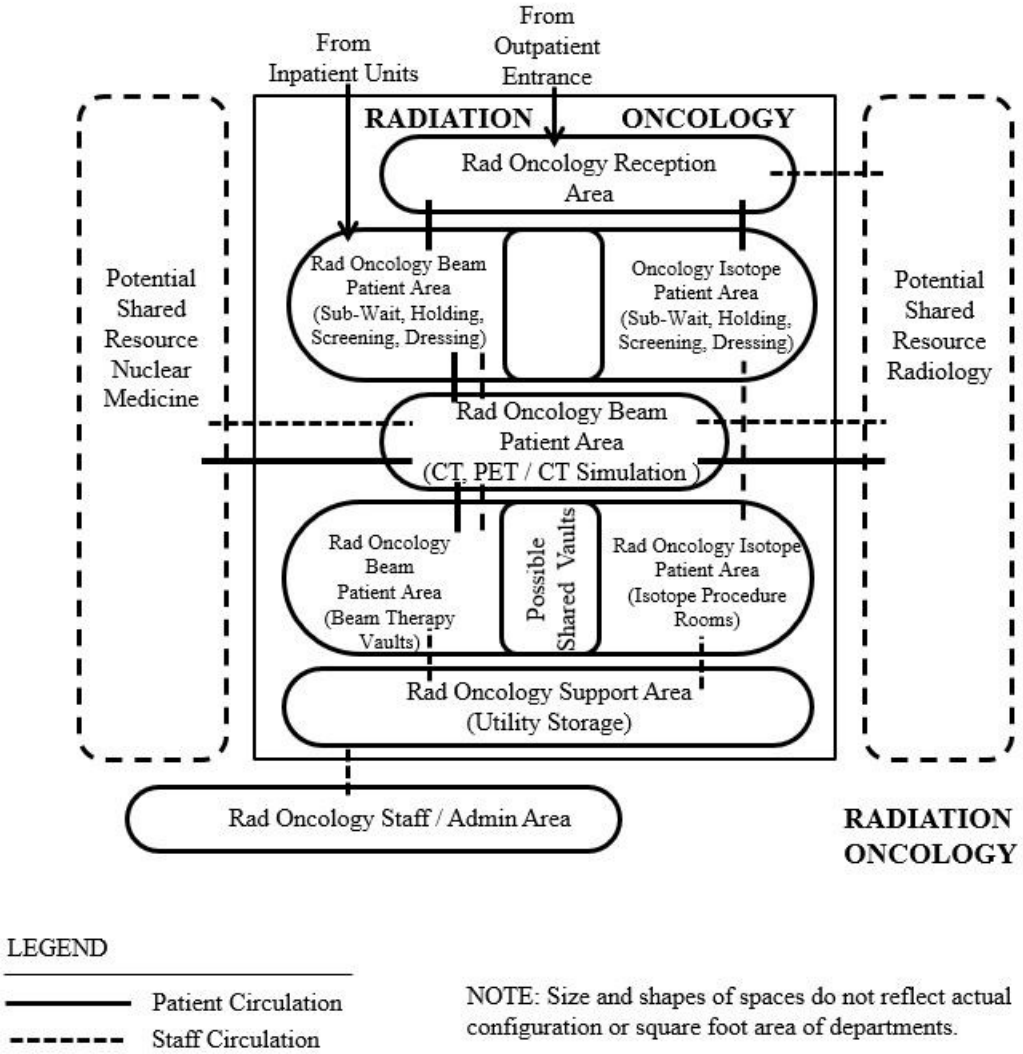
SECTION 15: FUNCTIONAL RELATIONSHIP (INTERDEPARTMENTAL): RADIATION ONCOLOGY

The Radiation Oncology will rely on several other services in the MTF for patient care and support functions. The diagram below represents desirable relationships based on efficiency and functional considerations.



SECTION 16: FUNCTIONAL DIAGRAM (INTRADEPARTMENTAL): RADIATION ONCOLOGY

The diagram below illustrates intradepartmental relationships among key areas / spaces within Radiation Oncology. The diagram is necessarily generic. The planner shall use this as a basis for design only and shall consider project-specific requirements for each MTF.



GLOSSARY

Average Length of Encounter (ALOE): In these space criteria, an encounter is defined as a face-to-face professional contact between a patient and a provider vested with responsibility for diagnosing, evaluating, and treating the patient's condition. The Length of Encounter is the time between set-up and clean-up of the Scanning Room. The Average Length of Encounter is used to capture variations in length of encounter among similar clinical encounters that will take place in a Scanning Room.

Beam Therapy: A class of radiation therapy which deposit high-energy beams or particles into the subject from a device external to the subject.

Blood Product Compounding: The creation of a particular pharmaceutical product within a sterile environment to fit the unique needs of a patient.

Brachytherapy: A radiation therapy procedure in which a radioactive object is placed within a diseased structure inside the patient's body. The radiation emitted by the object (seed) damages the diseased tissues.

Clean Room: An area / room designed to very specific tolerances for particulate matter in the air.

Clean Utility Room: This room is used for the storage and holding of clean and sterile supplies. Clean linen may be stored in a designated area in the clean utility room if space is not provided in a separate room or in an alcove.

"Cold": A term used to describe areas (typically within nuclear medicine or radiation therapy departments) that have not been exposed to radioactive materials and are intended to be kept free of exposure to radioactive materials.

Computed Radiology (CR): A technology by which conventional film images are precisely scanned to create a digital image for electronic viewing / storage. Legacy imaging equipment may be CR, but new systems should all be Digital Radiography (DR).

Computed Tomography (CT): A technique to produce derived cross-sectional images from a series of multi-dimensional X-ray images. The series of sectional, planar images may be manipulated to produce different planar or volumetric view of the areas of interest. CT is used for diagnostic imaging, interventional radiology, and therapy planning.

Consult Room: This is a consultation room for patients to meet with physicians or other providers privately and is ideally located near the waiting room.

Control Room: The separate room from which a technologist operates a radiologic / nuclear medicine device, such as a CT scanner, MRI scanner, or PET scanner.

Cubicle: A cubicle is a partially enclosed workspace, separated from neighboring workspaces by partitions. Staff with no supervisory responsibilities, or who do not deal with

confidential information for 75% or more of their workday, as well as part-time, seasonal, and job-sharing staff will be assigned a cubicle.

DEXA: Dual-Energy X-ray Absorptiometry (DEXA) is a technology through which bone density can be measured through the absorption of X-rays which pass through the body originating from a calibrated source.

Diagnostic Radiology: The medical specialty that utilizes imaging examinations to inform diagnosis.

Digital Radiography (DR): The direct capture of radiographic images in a digital format.

Encounter: A contact between an eligible beneficiary and a credentialed provider. An encounter may consist of examination, diagnosis, treatment, evaluation, consultation or counseling or a combination of the above. The encounter may take place in a clinic, by telephone, computer, or in other treatment or observation areas. Encounter volume used to generate exam room requirements should not include telephone encounters.

Ferromagnetic Detection: Equipment used to assist in the screening of subjects and equipment for MRI. Unlike conventional 'airport style' metal detectors, these specialized detectors detect only ferromagnetic (magnetizable) materials.

Four-Zone Principle: A concept of planning MRI suites which ties access privileges to areas of increasing hazard to access controls and direct supervision by safety-trained MRI Staff.

Fluoroscopy: The technique of capturing real-time cinematic X-ray images showing motion.

Full-Time Equivalent (FTE): A staffing parameter equal to the amount of time assigned to one full time employee. It may be composed of several part-time employees whose total time commitment equals that of a full-time employee. One FTE equals a 40-hour a week workload. The FTE measure may also be used for specific workload staffing parameters such as a clinical FTE; the amount of time assigned to an employee providing clinical care. For example, a 0.5 clinical FTE for a healthcare worker would indicate that the healthcare worker provides clinical care half of the time per a 40-hour work week.

Functional Area (FA): The grouping of rooms and spaces based on their function within a service. Typical Functional Areas are Reception, Patient Exam and Treatment Area, Clinic Support Area, Staff and Administration.

General Radiology Room: A room in which direct radiography is performed.

High Dose Rate / Low Dose Rate (HDR / LDR): Different forms of brachytherapy in which a small radioactive object is placed within the body of the patient to damage diseased tissues. For HDR brachytherapy, the object is placed for a short time (minutes) and removed. For LDR brachytherapy, the object is placed for months or even permanently left within the body of the patient.

"Hot": Term used to describe radioactive materials that are giving off ionizing radiation. Materials or areas that have been in contact with radioactive materials will also be considered "hot" for a period of time specific to the radioactive material in question.

Hot Lab / Radiopharmacy: An area dedicated to the safe storage and preparation of radiopharmaceuticals for use in nuclear medicine and/or radiation oncology areas.

Hours of Operation per Day: These are the hours of operation within a department, or a facility. For example, a hospital nursing unit and an emergency department will operate 24 hours per day; whereas a clinic or an ambulatory care center may be operational 8 hours or more.

Interventional Radiology (IR): The clinical subspecialty that uses radiology imaging modalities to guide minimally invasive procedures. IR Procedures are complex, requiring a team of doctors and technicians. As such, they are often performed in the Surgical Suite, and scheduled in advance as they require special preparation. Refer to Chapter 440: Surgical, Interventional Services and Ambulatory Surgery Center.

Input Data Statement: A set of questions designed to elicit information about the healthcare project in order to create a Program for Design (PFD) (see definition below); based on the space criteria parameters (refer to Section 5,7 & 9) set forth in this document. Input Data Statements are defined as Mission, Workload, Staffing or Miscellaneous.

Linear Accelerator (Single-Axis / Multi-Axis) / Linac: A beam therapy modality which propels high energy ionizing beams through a patient to damage diseased tissue. Total planned therapy is typically divided into multiple fractional doses, applied incrementally over periods of weeks or months. Traditional Linear Accelerators rotate around a single axis. Newer systems have the capability to robotically control the Linear Accelerator's orientation throughout multiple axes of movement.

Magnetic Resonance (MR) / Magnetic Resonance Imaging (MRI): A modality which uses magnetic fields and radiofrequency energy to generate tomographic and three-dimensional images of a patient. MR can also produce non-image diagnostic data, such as spectrographic analyses.

Mammography: A modality utilizing ionizing X-ray imaging for breast examinations.

Mammography, Stereotactic: Imaging of the breast from two slightly angled directions from which a three-dimensional model of the breast can be computer generated.

Moderate Sedation: Also referred to as "Conscious Sedation", is a drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

Net-to-Department Gross Factor (NTDG): A parameter used to calculate the Department Gross Square Foot (DGSF) area based on the programmed Net Square Foot (NSF) area. Refer to Section 3.

Net Square Feet (NSF): The area of a room or space derived by multiplying measurements of the room or space taken from the inside surface of one wall to the inside surface of the opposite wall.

Nuclear / Gamma Camera: A modality which measures the energy given off by low-energy radiopharmaceuticals, introduced within a patient to measure specific anatomic / metabolic functions.

Operating Days per Year: The number of days per calendar year a facility is operational for patient care.

Personal Property Lockers: This is a small-sized locker, commonly called purse or cell phone locker, and is generally used to secure purses and smaller valuables. Staff members who do not have an office or cubicle space where they can safely store belongings will be assigned these lockers.

Picture Archiving and Communication System (PACS) Viewing Room: A digital radiology reading room that consists of workstations for interpretation.

Positron Emission Tomography (PET): A modality which measures and triangulates the energy given off by radiopharmaceuticals within a patient to measure specific anatomic / metabolic functions. Formerly a stand-alone modality, PET imaging is now integrated in hybrid scanners (PET/CT and PET/MRI).

Program for Design (PFD): A listing of all of the rooms / spaces generated based on answers to the Input Data Statements (see Section 4) and the space planning criteria outlined in this document (Section 5) in SEPS. The list is organized by Functional Area and includes the Room Quantity, Room Code, Room Name and generated Net Square Feet (NSF), Construction Phase and Construction Type.

Project Room Contents (PRC): A listing of the assigned contents (medical equipment, FF&E, etc.) for each room in a PFD generated by the Space and Equipment Planning System (SEPS).

Provider: A medical professional, such as a physician, nurse practitioner, or physician assistant, who examines, diagnoses, treats, prescribes medications, and manages the care of patients within the scope of their practice as established by the governing body of a healthcare organization.

Radiography: A still X-ray image utilizing ionizing radiation.

Radiographic / Fluoroscopic (R/F) Room: A room containing a radiographic / fluoroscopic system that produces either still X-ray records or real-time images of internal body structures / functions.

Radiosurgery: High-intensity radio frequency (RF) beam therapy used to ablate / destroy diseased tissues within the body in a few therapy visits.

Resident Collaboration Room: This room is provided for the Residents. It will contain one cubicle per Resident, a table with chairs for collaboration space and bookcases.

Room Utilization Factor: The percentage of time that a room is in use to the time it could be in use over the course of a year. This factor provides flexibility to accommodate variability caused by other resources and processes involved in patient encounters. Smaller clinics should assume a lower utilization factor than larger clinics, because operational issues like provider and support staff absences and seasonal demand fluctuations have more significant impacts on patient scheduling.

Shortcuts: Shortcuts can be used by criteria managers to make the space criteria document more readable. They are used to replace any part of a condition with more readable text.

Soiled Utility Room: This space provides an area for cleanup of medical equipment and instruments, and for disposal of medical waste material. It provides temporary holding for material that will be picked up by Sterile Processing or Environmental Services.

Space and Equipment Planning System (SEPS): A digital tool developed by the Department of Defense (DoD) and the Department of Veterans Affairs to generate a Program for Design (PFD) and a Project Room Contents list (PRC) for a DoD project based on approved Space Planning Criteria, the chapter and specific project-related Mission, Workload and Staffing information entered in response to the Program Data Required - Input Data Statements (IDSs).

Scanning Room: For large-gantry imaging modalities (CT, MRI, PET), this is the room in which the patient is imaged within the scanner.

Simulation Room: An imaging room used to simulate the positioning of a patient for radiation therapy. The imaging modality may be CT, MRI, or hybrid modalities with PET.

SPECT / CT: A modality which combines the functional capabilities of a Nuclear / Gamma Camera with those of a CT scanner.

Sub-Waiting: An area for patient waiting dedicated to an individual modality (or multiple modalities with common screening / patient preparation procedures).

System Component Room: For many pieces of imaging / therapy equipment it is necessary (or minimally recommended) to place the supporting electronic componentry in a dedicated room.

Tomography: Imaging modalities which are capable of generating a ‘slice’ view. CT, MRI, and PET imaging are examples of tomographic imaging modalities.

Ultrasound: High frequency sound waves are utilized to view soft tissue and determine the size and shape of internal organs based on the differential rates of reflection. Images can be observed in real time to reveal motion and can include coloration of directional blood flow.

Unit Dose: A medication that is purchased or re-packaged in unit-of-use format, typically utilizing barcode technology to facilitate medication management. Unit dose medications can be dispensed directly to patients.

Vault: While shielding for most radiology and nuclear medicine modalities can be readily incorporated in conventional construction methods, shielding for many radiation therapy systems must be much more robust. Linear accelerators, for example, may have high-density reinforced concrete shield assemblies around the therapy device of one meter (or more) in thickness. HDR brachytherapy procedures may also require vault enclosures.

Workload: Space Planning Criteria per DHA Policy takes projected workload into account. In-person patient encounter projections divided by the throughput range included in this document for each exam room assists planners with estimating the quantity of rooms needed to satisfy the projected workload demand.