

CHAPTER 277: RADIATION THERAPY SERVICE

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1 PURPOSE AND SCOPE

This document outlines space planning criteria for Radiation Therapy Service. It applies to all medical facilities at the Department of Veterans Affairs (VA).

2 DEFINITIONS

Block / Mold Room: Dedicated area in which blocks are created for the purpose of shielding areas that need to be spared from treatment. These are then filled with a molten alloy to form the needed shielding for the patient as designed by the Radiation Oncologist. In addition, stints, bite blocks, bolus and other specialized devices are generated in this area. On a case-by-case basis, depending on the linear accelerator used, a block-mold room is not always required.

CT Simulation: CT Simulators are in the process of overtaking the conventional simulator for the treatment simulation / planning process. The CT-Simulator (CT-sim) provides the same type of images, described in the CT section of Chapter 276-Radiology while the patient is in the treatment position. This allows for immediate localization of treatment volume and subsequent planning. Using a CT-sim combines both conventional simulation and the planning CT scan. Since tumor localization and planning can be done in “real time” while the patient is present, it can also eliminate second simulations after the planning process is completed.

Intensity Modulated Radiation Therapy (IMRT): IMRT is one of the most advanced external beam radiation technology available for radiation treatment. This therapy varies the shape and intensity of the radiation beam across the treatment area minimizing damage to surrounding normal cell structures. IMRT uses the same medical linear accelerators that deliver x-ray beams in conventional Radiation Therapy, employing multi-leaf collimators, (computer-controlled devices) to conform the radiation beam to the shape of the tumor from any angle, and deliver higher or lower radiation doses to protect adjacent tissue.

Picture Archiving and Communication System (PACS): The digital capture, transfer, and storage of diagnostic images. A PACS system consists of workstations for interpretation, image/data producing modalities, a web server for distribution, printers for file records, image servers for information transfer and holding, and an archive of off-line information. A computer network is needed to support each of these devices.

Procedure / Suite Stop: A procedure / suite stop is one encounter of a patient with a healthcare provider. Per these criteria, the procedure / suite stop is the workload unit of measure for space planning. One individual patient can have multiple procedure / suite stops in a single visit or in one day.

Radiation Therapy: The use of high-energy X-Ray beams to produce ionizing radiation that may be used to treat cancer and some benign diseases. The modern linear accelerator provides both photon (X-Ray) and particle (electron) beams. Typically, the photons are available in two intensities that can be chosen as a function of the thickness of the body part to be treated. Radiation Therapy is also referred to as Radiotherapy or Radiation Oncology Room.



Simulator Unit: The simulator unit allows the radiation therapy to examine under fluoroscopic means the possible treatment field size and determine treatment volumes and daily setup parameters.

Tomotherapy: A form of cancer radiation therapy that combines the precision of a CT scan with the potency of radiation treatment to selectively destroy cancerous tumors while avoiding surrounding tissue. Tomotherapy rotates the beam source around the patient, thus allowing the beam to enter the patient from many different angles in succession. Thus, the tumor is more precisely targeted and the healthy tissue surrounding the tumor is subjected to much lower doses of radiation.

Treatment Planning Unit: In the planning unit, the planning of the patient's treatment is determined by precisely locating the diseased areas and deciding the best method of treatment.

Space Planning / SEPS

Accessible: A site, building, facility, or portion thereof that complies with provisions outlined in the Architectural Barriers Act of 1968 (ABA).

Architectural Barriers Act (ABA): A set of standards developed to ensure that all buildings financed with federal funds are designed and constructed to be fully accessible to everyone. This law requires all construction, renovation, or leasing of sites, facilities, buildings, and other elements, financed with federal funds, to comply with the Architectural Barriers Act Accessibility Standards (ABAAS). The ABAAS replaces the Uniform Federal Accessibility Standards (UFAS).

Average Length of Encounter (ALoE): Averaged length of time, in minutes, a patient spends in an Exam / Treatment Room interacting with a provider and the clinical support team. It is accounted from room “set-up” to “clean-up” by staff. This metric is used to determine the number of annual patient / provider encounters that take place in an Exam / Treatment Room which, in turn, is used to calculate the number of Exam / Treatment Rooms needed in a facility based on projected annual workload. The ALoE is determined with VHA SME input during a PG-18-9 clinical chapter revision / update.

Average Length of Stay (ALoS): The average number of days a patient Veteran stays in an inpatient care unit. The ALoS is used to calculate the number of patient bedrooms for a specialty by dividing the site's projected workload by the ALoS.

Building Gross (BG) Factor: A Factor applied to the sum of all the Departmental Gross Square Footage (DGSF) in a project to determine the Building Gross Square Footage. This factor accounts for square footage used by the building envelope, structural systems, horizontal and vertical circulation including main corridors, elevators, stairs and escalators, shafts, and mechanical spaces. The Department of Veterans Affairs has set this factor at 1.35 and included guidance in case of variance when developing a Program for Design (PFD) in SEPS.



Clinic Stop: Per these criteria, a clinic stop is the workload unit of measure for space planning. Clinic Stops are codified by VSSC, when applicable, they are referenced by number in the calculation of workload driven patient care spaces in this document.

Department Net to Gross (DNTG) Factor: A parameter, determined by the VA for each clinical and non-clinical department PG-18-9 space planning criteria chapter, used to convert the programmed Net Square Feet (NSF) area to the Department Gross Square Feet (DGSF) area.

Encounter: An interaction between a patient Veteran and a VA provider or providers in an Exam Room / Treatment Room / Consultation Room / Procedure Room, spaces where a patient Veteran received clinical care.

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 combined time commitment equals that of one full-time employee (i.e., 40 hours per week).

Functional Area (FA): The grouping of rooms and spaces based on their function within a clinical service or department.

Functional Area Criteria Statement (FACS): A verbalized mathematical / logical formulation assigned to a FA incorporating answers to Input Data Statements (IDSs) to determine the condition for providing the rooms / spaces listed in the FA in the baseline space program or Program for Design (PFD) for a project. Certain rooms / spaces may or may not have additional conditions.

Input Data Statement(s): A question or set of questions designed to elicit information about the healthcare project to generate a Program for Design (PFD) based on the parameters set forth in this set of documents. This information is processed through mathematical and logical operations in the VA Space and Equipment Planning System (SEPS).

JSN (Joint Schedule Number): A unique five alpha-numeric code assigned to each content item in the PG-18-5 Standard. JSNs are defined in DoD's Military Standard 1691 and included in SEPS Content Table.

Net Square Feet / Net Square Meters (NSF/NSM): The area of a room or space derived from that within the interior surface of the bounding walls or boundaries.

Patient Unique: (or Unique Patient), A Veteran patient counted as a unique in each division from which they receive care. Patient Uniques are included in the Registry for a VA Medical Center.

Program for Design (PFD): A project specific itemized listing of the spaces, rooms, and square foot area required for the proper operation of a specific service / department, and the corresponding area for each. PFDs are generated by SEPS based on the PG-18-9 Standard.

PG-18-5: A Department of Veterans Affairs' Equipment Guidelist Standard for planning, design, and construction of VA healthcare facilities; a Program Guide (PG) that lists assigned



room contents (medical equipment, furniture, and fixtures) to each room in PG-18-9. PG-18-5 follows PG-18-9's chapter organization and nomenclature.

PG-18-9: A Department of Veterans Affairs' Program Guide for the Space Planning Criteria Standard use to develop space planning guidance for the planning, design, and construction of VA healthcare facilities; a Program Guide (PG) that provides space planning guidance for VA Medical Centers (VAMCs) and Community Bases Outpatient Clinics (CBOCs). PG-18-9 is organized by chapters, as of September 2021 there are 56 clinical and non-clinical PG-18-9 chapters; they are implemented and deployed in SEPS so that space planners working on VA healthcare projects can develop baseline space programs.

PG-18-12: A Department of Veterans Affairs' Design Guide Standard for planning, design and construction of VA healthcare facilities, a Program Guide (PG) that provides design guidance for VA Medical Centers (VAMCs) and Community Bases Outpatient Clinics (CBOCs). The narrative section details functional requirements and the Room Template section details the planning and design of key rooms in PG-18-9. Not all PG-18-9 chapters have a corresponding PG-18-12 Design Guide; one Design Guide can cover more than one PG-18-9 chapter.

Provider: An individual who examines, diagnoses, treats, prescribes medication, and manages the care of patients within his or her scope of practice as established by the governing body of a healthcare organization.

Room Area: The square footage required for a clinical or non-clinical function to take place in a room / space. It takes into account the floor area required by equipment (medical and non-medical), furniture, circulation, and appropriate function / code-mandated clearances. Room area is measured in Net Square Feet (NSF).

Room Code (RC): A unique five alpha-numeric code assigned to each room in the PG-18-9 Standard. Room Codes in PG-18-9 are unique to VA and are the basis for SEPS's Space Table for VA projects.

Room Criteria Statement (RCS): A mathematical / logical formulation assigned to each room / space included in PG-18-9 incorporating answers to Input Data Statements (IDSs) to determine the provision of the room / space in the baseline space program or Program for Design (PFD) for a project.

Room Efficiency Factor: A factor that provides flexibility in the utilization of a room to account for patient delays, scheduling conflicts, and equipment maintenance. Common factors are in the 75% to 85% range. A room with 80% room efficiency provides a buffer to assume that this room would be available 20% of the time beyond the planned operational practices for this room. This factor may be adjusted based on the actual and/or anticipated operations and processes of the room/department at a particular facility.

SEPS: Acronym for Space and Equipment Planning System which produces equipment lists and Program for Design for a healthcare project based on specific information entered in response to Input Data Questions.



SEPS Importer: A style-based format developed to allow upload of RCSs and IDs to SEPS to implement and operationalize space planning criteria in PG-18-9 in the SEPS digital tool. This format establishes the syntax used in the RCSs and allows the use of Shortcuts. Shortcuts allow developers of space planning criteria statements to simplify RCSs making full use of their logical and mathematical functionality. A shortcut can refer to an RCS, a room in any FA or a formula. Shortcuts are [bracketed] when used in FAs and RCSs and are listed along with their equivalences at the end of the Space Planning Criteria section.

Space Planning Concept Matrix (SPCM): A working document developed during the chapter update process. It lists all the rooms organized by Functional Area and establishes ratios between the directly and the indirectly workload driven rooms for the planning range defined in this document. The matrix is organized in ascending workload values in ranges reflecting existing facilities and potential future increase. Section 5 of this document Space Planning Criteria reflects the values in the SPCM.

Stop Code: A measure of workload including clinic stops forecasted by the Office of Policy and Planning (OPP) for all Strategic Planning Categories at Medical Center and Outpatient Clinic levels.

Telehealth: The use of technology, such as computers and mobile devices, to manage healthcare remotely. It includes a variety of health care services, including but not limited to online support groups, online health information and self-management tools, email and online communication with health care providers, remote monitoring of vital signs, video, or online doctor visits. Depending on the concept of operations for this space, it may be equipped as an exam room or as a consult room with video/camera capability.

Utilization Rate: A factor used in the calculation of a directly workload-driven room throughput. It represents, in a percent value, the room is idle based on the planning assumptions. For example, if a directly workload-driven room is available for use 8 hours a day, the Utilization Rate represents the assumed time it will be used, an 85% utilization rate indicates, for planning purposes, the room will be used 6.8 hours a day. An additional directly workload-driven room will be provided in the calculation once the previous room has reached 100% utilization. The utilization Rate is embedded in the Room Throughput value calculated in Section 3 of this document.

VA Room Family (VARF): An organizational system of rooms / spaces grouped by function, a 'Room Family'. There are two "Orders" in the VARF: Patient Care and Patient Care Support; Patient Care features four sub-orders: Clinical, Inpatient, Outpatient and Residential Clinical. There are also four sub-orders in the Patient Care Support order: Building Support, Clinical Support, Staff Support and Veteran Support. Each room in a Family has a unique Room Code and NSF assigned based on its Room Contents and function which correspond to the specific use of the room. The same RC can be assigned to different Room Names with the same function in this document and can be assigned an NSF that varies based on the PG-18-5 Room Contents assigned to the room.

VA Technical Information Library (TIL): A resource website maintained by the Facilities Standards Service (FSS) Office of Construction and Facilities Management (CFM) containing



a broad range of technical publications related to the planning, design, leasing, and construction of VA facilities. VA-TIL can be accessed at: <https://www.cfm.va.gov/TIL/>

Workload: Workload is the anticipated number of procedures, clinic stops, clinic encounters etc. that is processed through a department/service area. The total workload applied to departmental operational assumptions will determine overall room requirements by modality.

Workstation: Area outfitted with equipment and furnishings, typically allocated 56 NSF each. Managers and other staff with no direct reports as well as part-time, seasonal, and job-sharing staff may qualify for a workstation. Such environments are particularly conducive to team-oriented office groupings. These environments work best when they have access to conference and small group meeting spaces.

3 OPERATING RATIONALE AND BASIS OF CRITERIA

- A. Space planning criteria included in this Standard have been specifically developed for this Department/ Service in a Department of Veterans Affairs healthcare facility based on established VHA policy and guidelines to define the scope of services provided for the existing workload demand as well as that in the foreseeable future. Rooms and Functional Areas are provided based on research of clinical and non-clinical activities performed in this Department.
- B. Development / update of VA's Program Guide (PG) standards is a research based effort executed with participation of VHA Subject Matter Experts (SMEs), VA-Construction and Facilities Management Office (CFM) professional staff and specialty consultants hired for the task. These space planning standards are based on current applicable VHA policies and guidelines, established and/or anticipated best practice standards, and latest medical technology developments. Workload metrics were tailored to satisfy current and anticipated veteran workload demand.
- C. The space planning component of PG-18-9 is based on the Space Planning Concept Matrix (SPCM) which lists all the rooms organized by Functional Area and assigns room quantity (Q) and area (NSF) for a series of ranges corresponding to the smallest to the largest department for this service in the VA healthcare system in incremental size; each range corresponds to a workload parameter which determines the number and area of each directly workload-driven room. The remainder of the rooms in the range i.e., waiting, storage, staff workstations, etc. are determined by ratios to the resulting number of or NSF of the workload-driven rooms.
- D. Sections 4 and 5 of these space planning standards as well as the PG-18-5 standard are implemented in the Space and Equipment Planning System (SEPS) and hosted at the MAX.gov website so planners working on VA Construction projects can develop single or multi-department projects based on these PG-18-9- and the PG-18-5 standards. Output from SEPS is through Space and Contents Reports; the Space Report is the Program for Design (PFD), the Content Report is the Project Room Contents (PRC). Inclusion of a Functional Area as well as Room quantity (Q) and determination of the room area (NSF)



in the PFD is based on the projected Workload input which triggers calculations included in the Room Criteria Statements (RCSs). The RCSs are placed immediately after each room name, room code and baseline area (NSF). The PRC list the medical equipment, furniture and fixtures associated to each Room Code in the project. The PFD & PRC are the baseline requirements for the planning phase of a VA project based on a site's projected workload for the target planning year. This chapter's corresponding PG-18-12, Design Guide -if available- is intended for use during the design phase of the project.

- E. Space Planning parameters and metrics in this document are based on the Radiation Therapy Service Space Planning Criteria Matrix (SPCM) developed as the basis for this chapter. The Radiation Therapy Service SPCM lists all the spaces a VA Radiation Therapy Service site would require; the quantity and NSF for each room is calculated based on the Radiation Therapy Service projected workload or number of FTE positions authorized. The SPCM is organized in 12 ranges, each range represents an incremental workload value equivalent to one Patient Care Room, this way all current VA Radiation Therapy Service sites are covered in the SPCM. The upper ranges are calculated for future facilities in case a higher projected workload or FTE positions authorized than those at the present time for Radiation Therapy Service. The SPCM is organized in 12 ranges as follows:
 - 1. Ranges 1 to 4: Linear Accelerator (IMRT) procedures between 1,920 and 25,600 annual procedures (in increments of 6,400)
 - 2. Ranges 1 to 4: CT Simulator procedures between 480 and 6,400 annual procedures (in increments of 1,600)
 - 3. Ranges 1 to 4: Ultrasound Planning procedures between 570 and 7,600 annual procedures (in increments of 1,900)
- F. The SPCM metrics are translated into one (or more) Room Criteria Statement (RCS) for each room in Section 5 of this document. The SPCM Planning Range, the maximum number of directly workload-driven patient care rooms, in this document is 10. If a project shall require provision of workload driven rooms above the maximum range value refer to CFM for guidance. Rooms in this space planning document are organized in 5 Functional Areas (FAs).
- G. Based on its intended function, each room / space is assigned a:
 - 1. Room Name (RN),
 - 2. Room Code (RC),
 - 3. Room Area, the Net Square Feet (NSF) and its corresponding "soft metric" Net Square Meters (NSM),
 - 4. Unique Room Criteria Statement(s) (RCSs) correlated to answers to Input Data Statements (IDSs), and
 - 5. Room Comment as needed.
- H. The Room Codes included in this chapter stem from the VA Room Family. A unique support space, that may have variable area, is assigned a unique Room Code, and adopts the square footage, as needed, correlated to the room contents assigned which in turn correspond to the range for those rooms. A unique clinical space or a direct



clinical support room, i.e., control room, system components room, etc. typically does not feature variable NSF. Patient Care room names for rooms unique to this chapter end in “, Rad Thrpy Svc”. Patient Care Support room names end in “, Bldg Sprt”, “Clncl Sprt”, “Stff Sprt”, or “, Vet Sprt”, correlating to Building, Clinical, Staff or Veteran Support room families.

- I. Section 5, Sub-Section F lists the SEPS Importer Shortcuts used for implementation of Sections 4 & 5 in SEPS. These shortcuts are inserted into the Room Criteria Statement (RCS) for each room which upon upload into the Space and Equipment Planning System (SEPS) allowing planners developing VA healthcare projects to determine quantity and square footage of each room by performing mathematical or logical calculations. Shortcuts refer Input Data Statements (IDSs), Rooms or calculation parameters stemming from the SPCM.
- J. SEPS is accessible to government healthcare planners and private sector consultants working on VA HC projects during their Period of Performance (PoP) through the MAX.gov website; government provided Training is a requisite for access.
- K. SEPS incorporates a Net-to-Department Gross factor (NTDG) factor of **1.60** for Radiation Therapy Service and a Building Gross factor of 1.35 in the space calculation to generate the Department Gross Square Feet (DGSF) and the Building Gross Square Feet (BGSF) respectively for the project based on the aggregate resulting Net Square Feet (NSF) for each range. Planners can adjust the BGSF factor in SEPS; the NTDG factor is fixed.
- L. Refer to the chapter corresponding PG-18-5 Equipment Guidelist for the Room Content assignment for each room during the planning phase of a project.
- M. Refer to the chapter corresponding PG-18-12: Design Guide, if available, during the planning and design phases of a project. Not all PG-18-9 clinical chapters have a corresponding PG-18-12 document, please refer to the VA-TIL.
- N. The space planning and design Program Guides: PG-18-9, PG-18-5, and PG-18-12 are available at the [Department of Veterans Affairs Office of Construction and Facilities Management \(CFM\) Technical Information Library \(TIL\)](#) website.

4 INPUT DATA STATEMENTS (IDS)

- A. How many annual Radiation Therapy procedures are projected? (W) (Values: 1,920 to 25,600)
- B. How many annual CT Simulator procedures are projected? (W) (Values: 480 to 25,600)
- C. How many annual Ultrasound procedures are projected? (W) (Values: 570 to 25,600)



5 SPACE PLANNING CRITERIA

A. FA 1: RECEPTION AREA

1. **Rad Thrpy Waiting, Bldg Sprr (SB003) 100 NSF (9.3 NSM)**
 - a. *Provide one if [number of patient rooms] is 1*
 - b. *Provide one at 130 NSF if [number of patient rooms] is 2*
 - c. *Provide one at 170 NSF if [number of patient rooms] is 3*
 - d. *Provide one at 215 NSF if [number of patient rooms] is 4*
 - e. *Provide one at 260 NSF if [number of patient rooms] is 5*
 - f. *Provide one at 290 NSF if [number of patient rooms] is 6*
 - g. *Provide one at 330 NSF if [number of patient rooms] is 7*
 - h. *Provide one at 370 NSF if [number of patient rooms] is 8*
 - i. *Provide one at 415 NSF if [number of patient rooms] is 9*
 - j. *Provide one at 465 NSF if [number of patient rooms] is 10*
 - k. *Provide one at 520 NSF if [number of patient rooms] is 11*
 - l. *Provide one at 530 NSF if [number of patient rooms] is 12*

Patient Rooms are:

IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)

CT Simulator Unit Room, Rad Thrpy Svc (CRT11)

Ultrasound Planning Unit, Rad Thrpy Svc (CRT21)

2. **Rad Thrpy Reception, Cncl Sprr (SC183) 85 NSF (7.9 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 4*
 - b. *Provide one at 260 NSF if [number of patient rooms] is between 5 and 12*

Allocated NSF accommodates two Receptionist FTEs, patient privacy area, and circulation.

3. **Rad Thrpy Patient Education Workstation, Cncl Sprr (SC172) 40 NSF (3.8 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*

4. **Rad Thrpy Visitor Toilet, Bldg Sprr (SB191) 60 NSF (5.6 NSM)**
 - a. *Provide two if [number of patient rooms] is between 1 and 12*

Allocated NSF accommodates one accessible toilet @ 25 NSF, one wall-hung lavatory @ 12 NSF, ABA clearances, and circulation. One for male and one for female.

B. FA 2: PATIENT AREA

1. **Rad Thrpy Patient Waiting, Bldg Sprr (SB003) 80 NSF (7.5 NSM)**
 - a. *Provide one if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is between 1 and 2*
 - b. *Provide one at 130 NSF if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is between 3 and 4*

2. **Rad Thrpy Consult Room, Cncl Sprr (SC271) 120 NSF (11.2 NSM)**
 - a. *Provide one if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is between 1 and 4*



- 3. IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)1,240 NSF (115.2 NSM)**
 - a. Provide one if [annual Radiation Therapy procedures projected] is between 1,920 and 6,400
 - b. Provide two if [annual Radiation Therapy procedures projected] is between 6,401 and 12,800
 - c. Provide three if [annual Radiation Therapy procedures projected] is between 12,801 and 19,200
 - d. Provide four if [annual Radiation Therapy procedures projected] is between 19,201 and 25,600

Area includes an allowance of 720 NSF for Procedure Room and 520 NSF estimated for wall thickness / shielding. Tomotherapy procedures are performed here.

- 4. Linear Accelerator Entrance Maze, Rad Thrpy Svc (CRT03)140 NSF (13.1 NSM)**
 - a. Provide one per each [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)]
- 5. Linear Accelerator Control Room, Rad Thrpy Svc (CRT04)120 NSF (11.2 NSM)**
 - a. Provide one per each [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)]
- 6. Rad Thrpy Patient Toilet, Bldg Sprt (SB201) 60 NSF (5.6 NSM)**
 - a. Provide one if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is between 1 and 2
 - b. Provide two if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is between 3 and 4

Allocated NSF accommodates one accessible toilet @ 25 NSF, one accessible wall-hung lavatory @ 13 NSF, ABA clearances, and circulation.

- 7. Procedure / Exam Room, Rad Thrpy Svc (CRT06)160 NSF (14.9 NSM)**
 - a. Provide one per each [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)]
- 8. Exam Room, Rad Thrpy Svc (CRT08)120 NSF (11.2 NSM)**
 - a. Provide one per each [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)]
- 9. Rad Thrpy Exam Room Patient Toilet, Bldg Sprt (SB201) 60 NSF (5.6 NSM)**
 - a. Provide one if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is between 1 and 2
 - b. Provide two if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is between 3 and 4

Allocated NSF accommodates one accessible toilet @ 25 NSF, one accessible wall-hung lavatory @ 13 NSF, ABA clearances, and circulation.

- 10. Rad Thrpy Patient Dressing Cubicle, Bldg Sprt (SB137) 35 NSF (3.3 NSM)**
 - a. Provide two if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is 1
 - b. Provide three if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is 2
 - c. Provide four if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is 3
 - d. Provide five if [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] is 4



Locate Dressing Room / Cubicles in proximity to Linear Accelerator Room and Treatment Planning Area.

- 11. Rad Thrpy Stretcher Holding Bay, Bldg Sprt (SB254) 80 NSF (7.5 NSM)**
a. Provide one per each [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)]

Provides space for staging/observation of patient pre/post procedure. Stretcher waiting should be adjacent to reception because patients transported by stretchers may require closer supervision.

C. FA 3: TREATMENT PLANNING UNIT AREA

- 1. CT Simulator Unit Room, Rad Thrpy Svc (CRT11)400 NSF (37.2 NSM)**
a. Provide one if [annual CT Simulator procedures projected] is between 480 and 1,600
b. Provide two if [annual CT Simulator procedures projected] is between 1,601 and 3,200
c. Provide three if [annual CT Simulator procedures projected] is between 3,201 and 4,800
d. Provide four if [annual CT Simulator procedures projected] is between 4,801 and 6,400

- 2. CT Simulator Control Room, Rad Thrpy Svc (CRT12)120 NSF (11.2 NSM)**
a. Provide one per each [CT Simulator Unit Room, Rad Thrpy Svc (CRT11)]

- 3. Film Processing Room, Rad Thrpy Svc (CRT16).....120 NSF (11.2 NSM)**
a. Provide one if [annual CT Simulator procedures projected] is between 480 and 6,400

Locate this room next to and with direct access to the simulator room. This area consists of a dark room and a light room and is used for developing and printing plates and film used in patient treatment.

- 4. Block / Mold Room, Rad Thrpy Svc (CRT17).....220 NSF (20.5 NSM)**
a. Provide one if [annual CT Simulator procedures projected] is between 480 and 6,400

- 5. Ultrasound Planning Unit, Rad Thrpy Svc (CRT21)180 NSF (16.8 NSM)**
a. Provide one if [annual Ultrasound procedures projected] is between 570 and 1,900
b. Provide two if [annual Ultrasound procedures projected] is between 1,901 and 3,800
c. Provide three if [annual Ultrasound procedures projected] is between 3,801 and 5,700
d. Provide four if [annual Ultrasound procedures projected] is between 5,701 and 7,600

This room provides space for a general-purpose scanning device which can be used for therapy planning, initial examinations, and follow-up examinations of patients.



6. Treatment Planning

Computer Room / Dosimetry, Rad Thrpy Svc (CRT26).....300 NSF (27.9 NSM)

- a. *Provide one if [Ultrasound Planning Unit, Rad Thrpy Svc (CRT21)] is between 1 and 4*

This room provides space for a radiation therapy treatment planning computer system.

7. Rad Thrpy Team Room, Clncl Sprt (SC243).....180 NSF (16.8 NSM)

- a. *Provide one if [number of patient rooms] is between 1 and 4*
- b. *Provide one at 240 NSF if [number of patient rooms] is between 5 and 8*
- c. *Provide one at 360 NSF if [number of patient rooms] is between 9 and 12*

D. FA 4: SUPPORT AREA

1. Sealed Source Room, Rad Thrpy Svc (CRT31).....120 NSF (11.2 NSM)

- a. *Provide one if [number of patient rooms] is between 1 and 12*

This room is used to store and prepare sealed sources containing radium or other radioactive material for use in surface, interstitial or intra-cavity application. This room may need to be isolated and/or shielded to avoid radiation exposure to individuals and radiation sensitive objects in the vicinity.

2. Physics Laboratory, Rad Thrpy Svc (CRT34)300 NSF (27.9 NSM)

- a. *Provide one if [number of patient rooms] is between 1 and 12*

Radiation scientific instrumentation and highly specialized equipment used by this service are kept in this room. Personnel in this area repair and maintain measuring devices and check their accuracy and precision. Carts may be stored in this area with oscilloscope, meters, and other electronic testing equipment.

3. Rad Thrpy Clean Utility Room, Lgstcs Svc (SB737)..... 100 NSF (9.3 NSM)

- a. *Provide one if [number of patient rooms] is between 1 and 4*
- b. *Provide one at 120 NSF if [number of patient rooms] is between 5 and 8*
- c. *Provide one at 140 NSF if [number of patient rooms] is between 9 and 12*

4. Rad Thrpy Soiled Utility Room, Lgstcs Svc (SB743)..... 100 NSF (9.3 NSM)

- a. *Provide one if [number of patient rooms] is between 1 and 4*
- b. *Provide one at 120 NSF if [number of patient rooms] is between 5 and 8*
- c. *Provide one at 140 NSF if [number of patient rooms] is between 9 and 12*

5. Rad Thrpy Housekeeping Aides Closet (HAC), Bldg Sprt (SB244) 60 NSF (5.6 NSM)

- a. *Provide one if [number of patient rooms] is between 1 and 12*

6. Rad Thrpy Clean Linen Alcove, EMS (SC467) 20 NSF (1.9 NSM)

- a. *Provide one if [number of patient rooms] is between 1 and 4*
- b. *Provide one at 30 NSF if [number of patient rooms] is between 5 and 8*
- c. *Provide one at 40 NSF if [number of patient rooms] is between 9 and 12*



- 7. PACS Quality Control Room, Rad Thrpy Svc (CRT36) 100 NSF (9.3 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*
- 8. PACS Files Storage Room, Rad Thrpy Svc (CRT37)140 NSF (13.1 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*
- 9. Non-Teaching**
 - Viewing / Consultation Room, Rad Thrpy Svc (CRT81)120 NSF (11.2 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*
- 10. Teaching**
 - Viewing / Consultation Room, Rad Thrpy Svc (CRT82)240 NSF (22.3 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*

The Viewing and Consultation Room is the focal point of activity where staff and residents will review patient results. Activities also include training, film viewing, and reading.
- 11. 3D Workstation, Rad Thrpy Svc (CRT41)120 NSF (11.2 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*
- 12. Computed Radiology (CR) Reader, Rad Thrpy Svc (CRT42) 40 NSF (3.8 NSM)**
 - a. *Provide one if [annual Radiation Therapy procedures projected] is between 1,920 and 6,400*
 - b. *Provide two if [annual Radiation Therapy procedures projected] is between 6,401 and 12,800*
 - c. *Provide three if [annual Radiation Therapy procedures projected] is between 12,801 and 19,200*
 - d. *Provide four if [annual Radiation Therapy procedures projected] is between 19,201 and 25,600*

Locate adjacent to each Linear Accelerator Room, CT Simulator Room, Ultrasound Planning Unit Room with CR capability.
- 13. Film Processing Darkroom, Rad Thrpy Svc (CRT46) 100 NSF (9.3 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*

Not required if also providing a daylight processor.
- 14. Daylight Processing Room, Rad Thrpy Svc (CRT47) 100 NSF (9.3 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*

Not required if also providing a darkroom.
- 15. Film Sorting Room, Rad Thrpy Svc (CRT48) 80 NSF (7.5 NSM)**
 - a. *Provide one if [number of patient rooms] is between 1 and 12*



- 16. Equipment Storage Room, Rad Thrpy Svc (CRT51).....200 NSF (18.6 NSM)**
a. Provide one if [number of patient rooms] is between 1 and 2
b. Provide one at 240 NSF if [number of patient rooms] is between 3 and 4
c. Provide one at 280 NSF if [number of patient rooms] is between 5 and 6
d. Provide one at 320 NSF if [number of patient rooms] is between 7 and 8
e. Provide one at 360 NSF if [number of patient rooms] is between 9 and 10
f. Provide one at 400 NSF if [number of patient rooms] is between 11 and 12

- 17. Rad Thrpy Wheelchair / Stretcher Storage Room,
Bldg Sprt (SB261) 40 NSF (3.8 NSM)**
a. Provide one if [number of patient rooms] is between 1 and 2
b. Provide two if [number of patient rooms] is between 3 and 4
c. Provide three if [number of patient rooms] is between 5 and 6
d. Provide four if [number of patient rooms] is between 7 and 8
e. Provide five if [number of patient rooms] is between 9 and 10
f. Provide six if [number of patient rooms] is between 11 and 12

- 18. Film Files Storage Room, Rad Thrpy Svc (CRT61)250 NSF (23.3 NSM)**
a. Provide one if [number of patient rooms] is between 1 and 12

- 19. Film Storage Room, Rad Thrpy Svc (CRT62) 60 NSF (5.6 NSM)**
a. Provide one if [number of patient rooms] is between 1 and 12

- 20. Chemical Storage Room, Rad Thrpy Svc (CRT66)..... 40 NSF (3.8 NSM)**
a. Provide one if [number of patient rooms] is between 1 and 12

E. FA 5: STAFF AND ADMINISTRATIVE AREA

- 1. Rad Thrpy Chief Office, Stff Sprt (SS204) 100 NSF (9.3 NSM)**
a. Provide one if [number of patient rooms] is between 1 and 12
- 2. Rad Thrpy Administration Waiting, Bldg Sprt (SB003) 80 NSF (7.5 NSM)**
a. Provide one if [number of patient rooms] is between 1 and 12

Allocated space accommodates one standard chair @ 9 NSF, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation: total three people.

- 3. Rad Thrpy
Administration Support Workstation, Stff Sprt (SS218) 56 NSF (5.3 NSM)**
a. Provide one if [number of patient rooms] is between 1 and 4
b. Provide two if [number of patient rooms] is between 5 and 8
c. Provide three if [number of patient rooms] is between 9 and 12



- 4. Rad Thrpy Staff Physician Workstation, Stff Sprt (SS218)..... 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 2*
 - b. Provide two if [number of patient rooms] is between 3 and 4*
 - c. Provide three if [number of patient rooms] is between 5 and 6*
 - d. Provide four if [number of patient rooms] is between 7 and 8*
 - e. Provide five if [number of patient rooms] is between 9 and 10*
 - f. Provide six if [number of patient rooms] is between 11 and 12*
- 5. Rad Thrpy Nurse Workstation, Stff Sprt (SS218) 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 2*
 - b. Provide two if [number of patient rooms] is between 3 and 4*
 - c. Provide three if [number of patient rooms] is between 5 and 6*
 - d. Provide four if [number of patient rooms] is between 7 and 8*
 - e. Provide five if [number of patient rooms] is between 9 and 10*
 - f. Provide six if [number of patient rooms] is between 11 and 12*
- 6. Rad Thrpy Professional Non-Physician Workstation, Stff Sprt (SS218) 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 4*
 - b. Provide two if [number of patient rooms] is between 5 and 8*
 - c. Provide three if [number of patient rooms] is between 9 and 12*
- 7. Rad Thrpy Physicist Workstation, Stff Sprt (SS218)..... 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 4*
 - b. Provide two if [number of patient rooms] is between 5 and 8*
 - c. Provide three if [number of patient rooms] is between 9 and 12*
- 8. Rad Thrpy Technologist Supervisor Workstation, Stff Sprt (SS218)..... 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 4*
 - b. Provide two if [number of patient rooms] is between 5 and 8*
 - c. Provide three if [number of patient rooms] is between 9 and 12*
- 9. Rad Thrpy PACS Administrator Workstation, Stff Sprt (SS218)..... 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 12*
- 10. Rad Thrpy Quality Assurance Workstation, Stff Sprt (SS218) 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 4*
 - b. Provide two if [number of patient rooms] is between 5 and 8*
 - c. Provide three if [number of patient rooms] is between 9 and 12*
- 11. Rad Thrpy Clerical Workstation, Stff Sprt (SS218)..... 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 6*
 - b. Provide two if [number of patient rooms] is between 7 and 12*
- 12. Rad Thrpy Data Processing Workstation, Stff Sprt (SS218) 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 6*
 - b. Provide two if [number of patient rooms] is between 7 and 12*



- 13. Rad Thrpy Scheduler Workstation, Stff Sprt (SS218)..... 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 6*
 - b. Provide two if [number of patient rooms] is between 7 and 12*
- 14. Rad Thrpy Transcriptionist Workstation, Stff Sprt (SS218) 56 NSF (5.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 6*
 - b. Provide two if [number of patient rooms] is between 7 and 12*
- 15. Rad Thrpy Patient Records File Room, Clncl Sprt (SC176) 80 NSF (7.5 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 4*
 - b. Provide one at 160 NSF if [number of patient rooms] is between 5 and 8*
 - c. Provide one at 240 NSF if [number of patient rooms] is between 9 and 12*
- 16. Telehealth Workstation, Rad Thrpy Svc (CRT71).....120 NSF (11.2 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 12*
- 17. Rad Thrpy Staff Conference Room, Educ Svc (SS101)240 NSF (22.3 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 4*
 - b. Provide one at 300 NSF if [number of patient rooms] is between 5 and 8*
 - c. Provide one at 500 NSF if [number of patient rooms] is between 9 and 12*

Allocated NSF accommodates six task chairs @ 7.5 NSF each, six 5'-0" x 2'-0" tables at 10 NSF each, one credenzas @ 8 NSF, and circulation: total six people.
- 18. Rad Thrpy Copy / Supply Room, Stff Sprt (SS272) 80 NSF (7.5 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 6*
 - b. Provide one at 100 NSF if [number of patient rooms] is between 7 and 12*
- 19. Storage Room, Rad Thrpy Svc (CRT76).....120 NSF (11.2 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 4*
 - b. Provide one at 140 NSF if [number of patient rooms] is between 5 and 8*
 - c. Provide one at 160 NSF if [number of patient rooms] is between 9 and 12*

This space is for storing, securing, and controlling unexposed film, chemical materials, auxiliary and ancillary equipment, and devices.
- 20. Rad Thrpy Staff Breakroom, Stff Sprt (SS262)120 NSF (11.2 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 4*
 - b. Provide one at 160 NSF if [number of patient rooms] is between 5 and 8*
 - c. Provide one at 200 NSF if [number of patient rooms] is between 9 and 12*
- 21. Rad Thrpy Female Staff Locker Room, Stff Sprt (SS282)150 NSF (14.0 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 12*

Provide locker space only for those FTEs without assigned office or workspace. For less than five FTE combine Locker Room facilities with adjacent department or sum in chapter 410.
- 22. Rad Thrpy Male Staff Locker Room, Stff Sprt (SS282)150 NSF (14.0 NSM)**
 - a. Provide one if [number of patient rooms] is between 1 and 12*



Provide locker space only for those FTEs without assigned office or workspace. For less than five FTE combine Locker Room facilities with adjacent department or sum in chapter 410.

23. Rad Thrpy Female Staff Toilet, Bldg Sprt (SB191)..... 60 NSF (5.6 NSM)

- a. Provide one if [number of patient rooms] is between 1 and 6
- b. Provide two if [number of patient rooms] is between 7 and 12

Allocated NSF accommodates one accessible toilet @ 25 NSF, one wall-hung lavatory @ 12 NSF, ABA clearances, and circulation.

24. Rad Thrpy Male Staff Toilet, Bldg Sprt (SB191) 60 NSF (5.6 NSM)

- a. Provide one if [number of patient rooms] is between 1 and 6
- b. Provide two if [number of patient rooms] is between 7 and 12

Allocated NSF accommodates one accessible toilet @ 25 NSF, one wall-hung lavatory @ 12 NSF, ABA clearances, and circulation.

F. SEPS IMPORTER SHORTCUTS

The following shortcuts are used in the Room Criteria Statements in the Radiation Therapy Service Functional Areas. These shortcuts are used during upload of this document into the Space and Equipment Planning System (SEPS) software during implementation of the space planning parameters contained herewith to allow for mathematical or logical calculations to be performed. Input Data Statements (IDSs), Rooms or a partial calculation formula can have a shortcut.

1. *number of patient rooms*: [IMRT Linear Accelerator Room, Rad Thrpy Svc (CRT02)] + [CT Simulator Unit Room, Rad Thrpy Svc (CRT11)] + [Ultrasound Planning Unit, Rad Thrpy Svc (CRT21)]
2. *annual Radiation Therapy procedures projected*: [How many annual Radiation Therapy procedures are projected?]
3. *annual CT Simulator procedures projected*: [How many annual CT Simulator procedures are projected?]
4. *annual Ultrasound procedures projected*: [How many annual Ultrasound procedures are projected?]

6 PLANNING AND DESIGN CONSIDERATIONS

- A. Centralized staff administration and support should be considered to maximize staff and space efficiency.
- B. Radiation Therapy is typically a stand-alone unit to maximize privacy for patients and families. However, in new facilities options should be explored in order to share space and staff with other diagnostic imaging modalities.
- C. Locate high volume services (Linear Accelerator Room) closer to patient waiting or building access point to decrease patient travel.



- D. PACS reading stations maybe located centrally or remotely (in offices); coordination is required to avoid duplication of locations. It should be noted that for general viewing by physicians outside the Radiation Therapy Service, a typical flat screen monitor will suffice for reading of images. A high-end monitor system should be provided in areas where physician viewing / diagnosis occurs within the Radiology Department or remotely.
- E. Provide separate outpatient intake and processing areas from inpatient circulation and holding areas when both patient types utilize the same department and/or procedure rooms.
- F. Verify room sizes and equipment layouts with imaging equipment vendors prior to finalizing room layouts.
- G. Corridors should be designed a minimum of 8 feet in width, to accommodate passage of two stretchers and/or wheelchairs, equipment, or beds. In non-patient zones / areas, corridors may be adjusted to 6 feet.
- H. With the continued move to complete PACS system, locate film file spaces to facilitate alternative use in the future.
- I. The spatial organization of Radiation Therapy is predicated on four areas. These areas are (1) Reception, (2) Patient Care / Treatment Planning, (3) Support and (4) Staff and Administration. The configuration of these four functional areas must locate patient care and related treatment planning areas contiguous to one another with direct access / circulation. This area should provide direct staff access between patient care and support areas. In addition, patient care area should be configured adjacent to the reception / public components including patient waiting, patient control and patient administration functions to permit convenient patient circulation to dressing rooms, examination rooms and diagnostic / treatment rooms.
- J. Minimize travel distance from main patient entrance to Radiation Therapy Service Sub-waiting.
- K. Most outpatients are typically accompanied by at least one family member or visitor who will also require waiting space. Patient Stretcher Holding Bay should be co- located with the Sub-Waiting area and Reception, and visual separation should be provided to ensure patient privacy and dignity.
- L. Examination rooms should be located adjacent to the dressing rooms. They are used to evaluate patients on initial consultation, to examine patients during treatment and to see patients after the completion of therapy.
- M. Dressing room may be utilized as a gowned patient holding area for patients waiting to enter a treatment or examination area.
- N. The Linear Accelerator Room requires shielding to protect surrounding areas from radiation generated by the equipment. If an entrance maze is required, it should be



designed to minimize shielding while providing convenient access of a stretcher and equipment to the treatment room.

- O. Control Area for the Linear Accelerator Room may be located in an alcove off the staff circulation corridor.
- P. Patient Stretcher Holding Bay houses a hyperthermia system and may require RF screening.
- Q. Refer to Department of Veterans Affairs (VA) Office of Facilities Management Handbooks, Standards, Standard Details, and Design Guides for technical criteria.
- R. Refer to Department of Veterans Affairs (VA) Office of Construction and Facilities Management Technical Information Library (www.cfm.va.gov/til/) for additional technical criteria.

7 FUNCTIONAL RELATIONSHIPS

Relationship of Radiation Therapy Service to services listed below:

TABLE 1: FUNCTIONAL RELATIONSHIP MATRIX

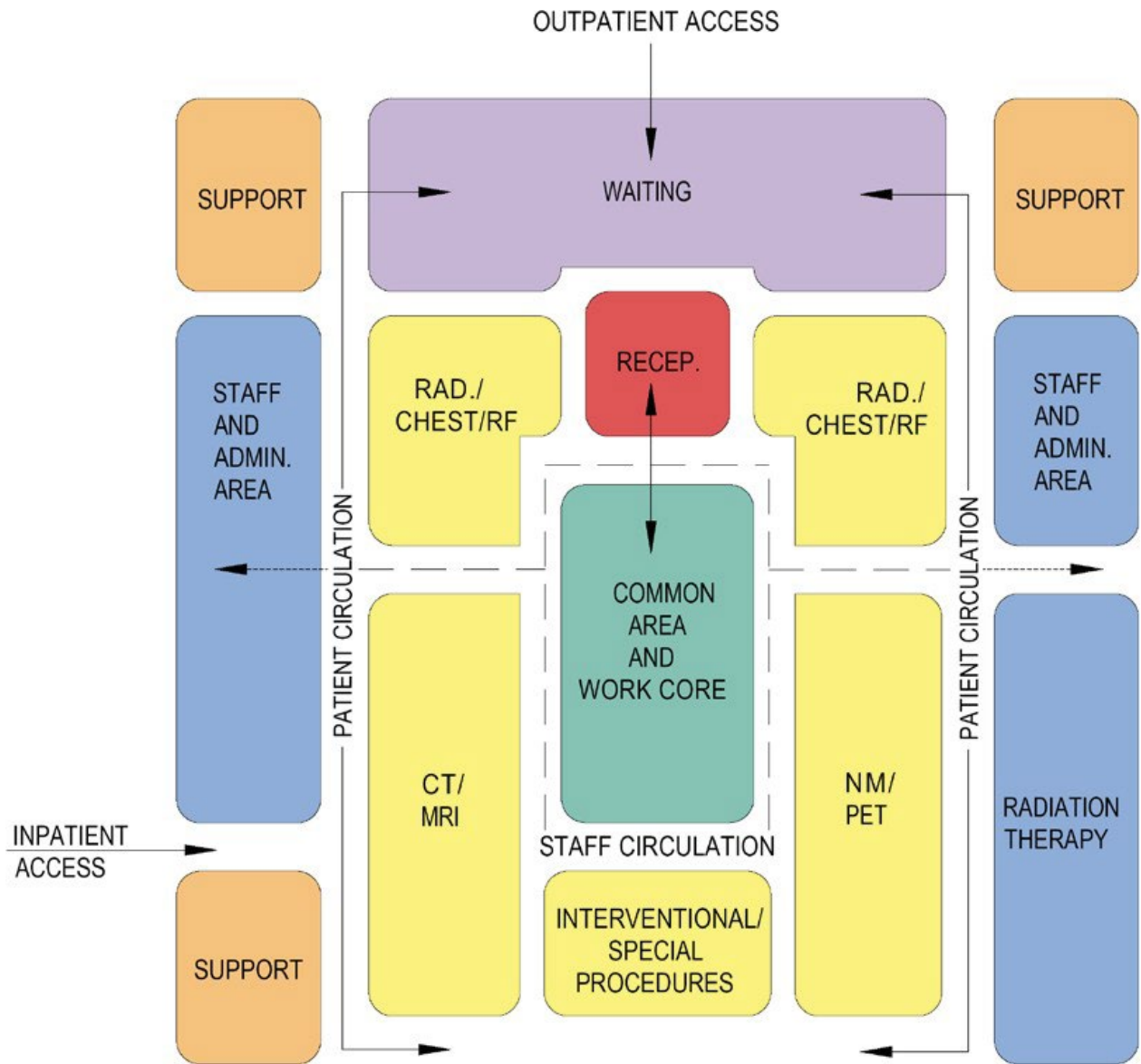
SERVICES	FUNCTIONAL RELATIONSHIP
IP: MS PCUs	3
BLDG SPRT: Logstcs Svc: Warehouse	3
CLNCL SPRT: OIT: Telecommunications	3
BLDG SPRT: ENG: Engineering Service (all specialties)	3
CLNCL SPRT: EMS: Production	3
OP: CBOP: Patient Care	3
BLDG SPRT: Lobby	3
CLNCL SPRT: OIT: Server	3
CLNCL: Imgng Svcs: Radiography	3
CLNCL: Imgng Svcs: PET/ CT	3
CLNCL: Imgng Svcs: PET/MRI	3
CLNCL: Surg Svc: Inpatient Surgery	3
CLNCL: Surg Svc: Ambulatory Surgery	3
IP: ICU PCUs	3
CLNCL SPRT: R&D: Clinical Services	3

Legend:

- 1. High
- 2. Moderate
- 3. Minimal



8 FUNCTIONAL DIAGRAM 1: Radiation Therapy Functional Area Relationship by Modality



9 FUNCTIONAL DIAGRAM 2: Radiation Therapy Area Relationship

