

**CHAPTER 210: VETERANS HEALTH ADMINISTRATION
CARDIOVASCULAR LABORATORY SERVICE**

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1 PURPOSE AND SCOPE

This document outlines Space Planning Criteria for Chapter 210: Cardiovascular Laboratory Service. It applies to all medical facilities in Department of Veterans Affairs (VA).

2 DEFINITIONS

- A. Blood Gas Analysis: A test which analyzes arterial blood for oxygen, carbon dioxide, and bicarbonate content in addition to blood pH. It is used to test the effectiveness of respiration.
- B. Cardiac Catheterization (Cardiac Cath): A cardiac procedure where a thin plastic tube (catheter) is inserted into an artery or vein in the arm or leg. The catheter is then advanced into the chambers of the heart, or into the coronary arteries. This procedure is performed to obtain diagnostic information about the patient's heart and blood vessels. It may also be used to provide therapeutic interventions in certain types of heart conditions.
- C. Cardiac Stress Test: A cardiac stress test is a medical test performed to evaluate the ability for arterial blood flow to the myocardium (heart muscle) to increase during the stress of physical exercise, compared to blood flow while at rest. As an exercise test, results also reflect overall physical fitness. This test is ordered as a screening procedure for heart disease. It takes approximately 30 minutes, usually including 6-9 minutes of treadmill walking. Electrodes are placed on the chest so that the EKG is monitored during the entire exam, while the physician monitors the patient's blood pressure.
- D. Cardiac Stress Test – Nuclear: This test follows the same procedure as the Cardiac Stress Test, with the addition of a nuclear scan. To scan the heart with a nuclear camera, a small amount of nuclear substance is injected into the patient, which acts as a tracer. This allows the tracking of blood cells as they circulate from the arteries to the heart muscle. Nuclear images are taken with a nuclear medicine camera after the exercise phase as well as at rest for comparison.
- E. Cardiology: The study of the heart and its functions.
- F. Clinic Stop: A clinic stop is one encounter of a patient with a healthcare provider. Per these criteria, the clinic stop is the workload unit of measure for space planning. One individual patient can have multiple Clinic Stops in a single visit or in one day.
- G. Echocardiogram (ECHO): A diagnostic test which uses ultrasound waves to make images of the heart chambers, valves, and surrounding structures. It can measure cardiac output and is a sensitive test for pericarditis and inflammation around the heart.
- H. Electrocardiogram (EKG): A test that records the electrical activity of the heart, shows abnormal rhythms (arrhythmias or dysrhythmias), and detects heart muscle damage.
- I. 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 40 hours per week.

- J. Functional Area: The grouping of rooms and spaces based on their function within a clinical service. Typical Functional Areas within VA Space Criteria are: Reception Area, Patient Area, Support Area, Staff and Administrative Area, and Education Area.
- K. Healthcare Planning Module: Methodology used to create a VISN Strategic Plan which defines how and where high-cost services should be delivered in each market.
- L. Holter Monitor: A device which measures the heart rhythm during a 24 hour period of time while the patient records their symptoms and activities in a diary. A small portable EKG device is worn by the patient. After the test is complete, a correlation is made between the symptoms (or activities) recorded and the EKG pattern that was obtained simultaneously.
- M. Input Data Statements: A set of questions designed to elicit information about the healthcare project in order to create a Program For Design (PFD) based on the criteria parameters set forth in this document. Input Data Statements could be Mission, Workload, or Staffing related, based on projections and data provided by the VHA or the VISN about the estimated model of operation for the facility. This information is processed through mathematical and logical operations in VA-SEPS.
- N. Invasive Cardiology: Procedures that include all invasive cardiac related services such as Cardiac Catheterization, Therapeutic Cardiovascular Procedures, Electrophysiology (EP) and Pacemaker Implantation.
- O. Non-Invasive Cardiology: Procedures that do not penetrate the skin or invade the body, except for minor needle punctures. Non-Invasive procedures include EKG, Holter Monitoring, Echocardiography, Vascular Testing, Ultrasound, and Nuclear Cardiology.
- P. Pacemaker Implants: An “artificial pacemaker” is a small, battery-operated device that helps the heart beat in a regular rhythm. Some devices are permanent (internal) and some are temporary (external).
- Q. 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 digital imaging devices.
- R. Program For Design (PFD): A space program generated either manually or by VA-SEPS based on criteria set forth in this document and specific information entered about mission, workload projections, and staffing levels authorized.
- S. 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.
- T. 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 any particular facility.

- U. SEPS (VA-SEPS): Acronym for Space and Equipment Planning System, a digital tool developed by the Department of Defense (DOD) and the Department of Veterans Affairs to generate a Program For Design (PFD) and an Equipment List for a VA healthcare project based on specific information entered in response to Input Data Questions. VA-SEPS incorporates the propositions set forth in all VA space planning criteria chapters. VA-SEPS has been designed to aid healthcare planners in creating a space plan based on a standardized set of criteria parameters.
- V. Tilt Table Test: A test which involves placing the patient on a table with a foot-support. The table is tilted in various directions and the blood pressure and pulse are measured and symptoms are recorded with the patient in diverse positions.
- W. Transesophageal Echocardiography (TEE): A diagnostic echocardiogram test which is done through the esophagus and employs ultrasound waves to make images of the heart chambers, valves, and surrounding structures. The esophagus is located directly behind the heart, and images from a TEE test can give very clear pictures of the heart and its structure.
- X. Ultrasound: High frequency sound waves which are utilized to determine the size and shape of organs based on the differential rates of reflection. In addition, images can be observed in real time to reveal motion, and can include coloration of arterial and venous blood flow.
- Y. Workload: Workload is the anticipated number of clinic stops that is processed through a department/service area. The total workload applied to departmental operational assumptions will determine overall room requirements by modality.

3 OPERATING RATIONALE AND BASIS OF CRITERIA

- A. Workload projections or planned services/modalities for a specific VA project are provided by the VA Office of Policy and Planning and the VISN Support Services Center (VSSC). These utilization projections are generated by a methodology based upon the expected veteran population in the respective market/service area. Healthcare planners working on VA projects will utilize and apply the workload based criteria set forth herein for identified services and modalities to determine room requirements for each facility.
- B. Space planning criteria have been developed on the basis of an understanding of the activities involved in the functional areas of the Cardiovascular Laboratory Service and its relationship with other services of 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 veterans.
- C. These criteria are subject to modification relative to development in equipment, medical practice, vendor requirements, and planning and design. The selection of the size and type of Cardiovascular Laboratory Service equipment is determined by anticipated medical needs.
- D. Room Capacity should be based on:

Formula 1:

$$\frac{\text{Operating days per year X Hours of operation per day}}{\text{Minutes per clinic stop / 60 minutes}} = \text{Number of annual clinic stops}$$

The general planning model for VA facilities assumes 250 Operating Days per Year and 8 Hours of Operation per Day. Room capacity will fluctuate as operating days per year and/or hours of operation are modified. For example, additional capacity may be generated by extending the hours of operation per day within the same physical setting.

The Room Efficiency Factor applied to Cardiovascular Laboratory Service is 80%.

Example: Annual Clinic Stops for Cardiology (Stop Code 303) based upon an average 45 minutes per clinic stop, including set-up, testing time, and clean-up:

$$\frac{250 \text{ operating days per year} \times 8 \text{ hours per day}}{45 \text{ minutes per clinic stop} / 60 \text{ minutes}} = 2,667 \text{ annual clinic stops}$$

At 100% utilization, this results in a maximum capacity of 2,667 clinic stops per year. However, 100% utilization is not realistic to achieve and is not a design standard. Apply the Room Efficiency Factor:

$$2,667 \times 80\% = 2,133 \text{ annual clinic stops.}$$

TABLE 1: WORKLOAD PARAMETER CALCULATION

CLINIC STOP CODE DESIGNATION	AVERAGE LENGTH OF CLINIC STOP (minutes)	ROOM EFFICIENCY FACTOR	ANNUAL WORKLOAD CAPACITY OF ONE ROOM*	MINIMUM ANNUAL WORKLOAD TO GENERATE A ROOM**
Stop Code 107 EKG	20	80%	4,800	1,440
Stop Code 303 Cardiology	45	80%	2,133	640
Stop Code 311 Pacemaker	30	80%	3,200	960
Stop Code 333 Cardiac Cath	125	80%	768	230
Stop Code 334 Cardiac Stress Test	75	80%	1,280	384

* Based on Operating Criteria assumed in Item D above.

** Minimum annual workload to generate a room is equal to 30% of the annual workload capacity of one room.

The number of annual clinic stops per room will be used as a criterion parameter to calculate the number of Procedure Rooms required, rounded up to the nearest whole number, as follows:

Formula 2:

Total Number of Procedure Rooms Calculation

$$\frac{\text{Projected Annual Workload}}{\text{Average Workload Capacity to Generate One Room}} = \text{Number of Cardiac Cath Labs}$$

Example: Cardiac Cath Labs based upon a workload of 2,000 Cardiac Cath clinic stops.

$$\frac{2,000 \text{ Projected Annual clinic stops}}{768 \text{ (Annual Workload Capacity One Room)}} = 2.6 \text{ Exam Rooms}$$

Three Procedure Rooms are required to satisfy the workload.

4 PROGRAM DATA REQUIRED (Input Data Statements)

A. Mission Input Data Statements

1. Is a Patient Education / Resource Room authorized?
2. Are Patient Prep / Recovery Rooms authorized? If the answer is 'NO', then Patient Prep / Recovery Cubicles will be provided.
3. Is a Cardiology Team Workroom authorized?
4. Are Provider Changing Cubicles authorized?
5. Is a Cardiovascular Laboratory Service Residency Program authorized?
6. Is a Cardiovascular Laboratory Service Education Area Conference / Classroom authorized?
7. Is a Cardiovascular Laboratory Service Education Area Provider Resource Center Library authorized?
8. Is a Cardiovascular Laboratory Service Education Area Viewing Room authorized?

B. Workload Input Data Statements

1. How many annual EKG clinic stops (Stop Code 107) are projected?
2. How many annual Cardiology clinic stops (Stop Code 303) are projected?
3. How many annual Pacemaker clinic stops (Stop Code 311) are projected?
4. How many annual Cardiac Catheterization clinic stops (Stop Code 333) are projected?
5. How many annual Cardiac Stress Test clinic stops (Stop Code 334) are projected?

C. Staffing Input Data Statements

1. How many Receptionist FTE positions are authorized?
2. How many EKG Technician FTE positions are authorized?
3. How many Nurse FTE positions are authorized?
4. How many Physician FTE positions are authorized?
5. How many Nurse Manager FTE positions are authorized?
6. How many Nurse Practitioner FTE positions are authorized?
7. How many Technician FTE positions are authorized?
8. How many Administrative FTE positions are authorized?
9. How many Intern FTE positions are authorized?
10. How many Resident FTE positions are authorized?
11. How many Fellow FTE positions are authorized?
12. How many FTEs will work on peak shift?

D. Miscellaneous Input Data Statements

1. How many Holter Monitor Rooms are authorized?
2. How many Echocardiograph Rooms are authorized?
3. How many Stress Echocardiograph Rooms are authorized?
4. How many Stress Testing Treadmill Rooms are authorized?

5. How many Tilt Table Testing Rooms are authorized?
6. How many Transesophageal Echocardiograph Rooms are authorized?
7. How many Cardiac CT / MRI Rooms are authorized?

5 SPACE CRITERIA

For functional descriptions of key spaces refer to the Design Guide for Cardiovascular Laboratory Service.

A. FA 1: Reception Area:

1. **Waiting (WRC01).....120 NSF (11.1 NSM)**
Minimum NSF; provide an additional 60 NSF per each EKG Testing Room, Cardiology Exam Room, Holter Monitor Room, Echocardiograph Room, Stress Echocardiograph Room, Stress Testing Treadmill Room, Tilt Table Testing Room, Pacemaker ICD Interrogation Room, Cardiac Catheterization Laboratory, Electrophysiology Procedure Room, and Transesophageal Echocardiograph (TEE) Room greater than one.

Allocated minimum NSF provides area for four standard seats and two wheelchair accessible seats. Additional 60 NSF provides area for two standard seats and one wheelchair accessible seat

2. **Toilet, Family (TLTF3)75 NSF (7.0 NSM)**
Provide one per Cardiovascular Laboratory Service.

This space may be shared with an adjacent service / clinic.

3. **Toilet, Public (TLTU1).....60 NSF (5.6 NSM)**
Minimum one; provide an additional one for each increment of four EKG Testing Room, Cardiology Exam Room, Holter Monitor Room, Echocardiograph Room, Stress Echocardiograph Room, Stress Testing Treadmill Room, Tilt Table Testing Room, Pacemaker ICD Interrogation Room, Cardiac Catheterization Laboratory, Electrophysiology Procedure Room, and Transesophageal Echocardiograph (TEE) Room greater than four.

4. **Reception / Check-In (RECP1).....60 NSF (5.6 NSM)**
Minimum NSF; provide an additional 60 NSF per each Receptionist FTE position authorized greater than one.

5. **Patient Education / Resource Kiosk (CLSC1).....30 NSF (2.8 NSM)**
Provide one per Cardiovascular Laboratory Service.

Used as a medical information resource for patients and visitors. Locate accessible to Waiting.

6. **Patient Education / Resource Room (CLSC3)120 NSF (11.1 NSM)**
Provide one per Cardiovascular Laboratory Service if authorized.

Patient Education/Resource Room to be used for private patient education needs and also as a medical information resource, which may include electronic and hard copy materials, for patients and visitors. Locate accessible to Waiting.

B. FA 2: Non Invasive Cardiology Patient Area:

1. **Pacemaker ICD Interrogation Room (EXRC2).....120 NSF (11.1 NSM)**
Provide one for every increment of 3,200 Pacemaker annual clinic stops (Stop Code 311); minimum workload to provide a room is 960 annual clinic stops.
2. **EKG Testing Room (OPEC1)150 NSF (13.9 NSM)**
Provide one for every increment of 4,800 EKG annual clinic stops (Stop Code 107); minimum workload to provide a room is 1,440 annual clinic stops.
3. **Exam Room, Cardiology (EXRC1).....120 NSF (11.1 NSM)**
Provide one for every increment of 2,133 Cardiology annual clinic stops (Stop Code 303); minimum workload to provide a room is 640 annual clinic stops.
4. **Holter Monitor Room (OPHM1).....150 NSF (13.9 NSM)**
Provide one per each Holter Monitor Room authorized.
5. **Echocardiograph Room (OPPE1)150 NSF (13.9 NSM)**
Provide one per each Echocardiograph Room authorized.
6. **Stress Echocardiograph Room (OPPE2)290 NSF (26.9 NSM)**
Provide one per each Stress Echocardiograph Room authorized.
7. **Stress Testing Treadmill Room (OPTM1).....290 NSF (26.9 NSM)**
Provide one per each Stress Testing Treadmill Room authorized.
8. **Tilt Table Testing Room (OPTM2)180 NSF (16.7 NSM)**
Provide one per each Tilt Table Testing Room authorized.
9. **Consult Room (OFDC2)120 NSF (11.1 NSM)**
Provide one per Cardiovascular Laboratory Service.
10. **Reading Room, ECHO (XVC01).....160 NSF (14.9 NSM)**
Minimum NSF; provide an additional 40 NSF for every increment of four Echocardiograph and Stress Echocardiograph Rooms greater than four.
11. **Muse Reading Station, EKG (XVC01)120 NSF (11.1 NSM)**
Provide one if the total of EKG Testing Rooms is one or greater than one.
12. **Toilet, Patient (TLTU1)60 NSF (5.6 NSM)**
Minimum one; provide an additional one for each increment of eight EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, and Tilt Table Testing Rooms, greater than eight.

C. FA 3: Non Invasive Cardiology Support Area

1. **Utility Room, Clean (UCCL1)80 NSF (7.4NSM)**
Minimum NSF; provide an additional 40 NSF if the total number of Pacemaker ICD Interrogation Rooms, EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, and Tilt Table Testing Rooms is greater than eight

Allocated NSF can be decentralized to reduce travel distances for staff.

2. **Utility Room, Soiled (USCL1) 100 NSF (9.3 NSM)**
Minimum NSF; provide an additional 40 NSF if the total number of Pacemaker ICD Interrogation Rooms, EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, and Tilt Table Testing Rooms is greater than eight.

Allocated NSF can be decentralized to reduce travel distances for staff.

3. **Event / Holter Monitor Work Room (OPHM2) 150 NSF (13.9 NSM)**
Minimum area; provide an additional 80 NSF (7.4 NSM) per each additional EKG Technician position authorized greater than two.
4. **Storage, Non Invasive Cardiology Supplies (SRSE1) 120 NSF (11.1 NSM)**
Minimum NSF; provide an additional 40 NSF for each increment of four Pacemaker ICD Interrogation Rooms, EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, and Tilt Table Testing Rooms, greater than four.

Room can be subdivided as needed to reduce travel distances for staff.

5. **Storage, ICD Equipment (SRSE2) 150 NSF (13.9 NSM)**
Minimum NSF; provide an additional 40 NSF for each increment of eight Pacemaker ICD Interrogation Rooms, Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than eight.

Allocated NSF can be decentralized to reduce travel distances for staff.

6. **Storage, Equipment (SRE01) 160 NSF (14.9 NSM)**
Minimum NSF; provide an additional 40 NSF for each increment of four Pacemaker ICD Interrogation Rooms, EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, and Tilt Table Testing Rooms, greater than four.

Room can be subdivided as needed to reduce travel distances for staff.

7. **Alcove, Crash Cart (RCA01) 20 NSF (1.9 NSM)**
Minimum two; provide an additional one for each increment of eight Pacemaker ICD Interrogation Rooms, EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, and Tilt Table Testing Rooms greater than eight.
8. **Alcove, Wheelchair / Stretcher (SRLW1) 60 NSF (5.6 NSM)**
Minimum two; provide an additional one for each increment of eight Pacemaker ICD Interrogation Rooms, EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, and Tilt Table Testing Rooms greater than eight.

9. **Housekeeping Aides Closet - HAC (JANC1)****60 NSF (5.6 NSM)**
Provide one if the total number of Pacemaker ICD Interrogation Rooms, EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, and Tilt Table Testing Rooms is one or greater than one.

D. FA 4: Invasive Cardiology Patient Area:

1. **Cardiac Catheterization Laboratory (XCCE1)****650 NSF (60.4 NSM)**
Provide one for every increment of 768 Cardiac Catheterization annual clinic stops (Stop Code 333); minimum workload to provide a room is 230 annual clinic stops.

2. **Control Room, Cardiac Catheterization (XCCC1)**.....**275 NSF (25.5NSM)**
Provide one per each Cardiac Catheterization Laboratory

Rooms may be combined where multiple Cardiac Catheterization Laboratories are provided. Control room should have a raised floor for visibility into procedure rooms.

3. **Procedure Room, Electrophysiology (XCCE1)****650 NSF (60.4 NSM)**
Provide one for every increment of 1,280 Cardiac Stress Test annual clinic stops (Stop Code 334); minimum workload to provide a room is 384 annual clinic stops.

4. **Control Room, Electrophysiology (XCCC1)**.....**150 NSF (13.9 NSM)**
Provide one per each Electrophysiology Procedure Room.

Rooms may be combined where multiple Electrophysiology Procedure Rooms are provided.

5. **Transesophageal Echocardiograph (TEE) Room (TRTE1)****250 NSF (23.2 NSM)**
Provide one per each Transesophageal Echocardiograph Room authorized.

6. **TEE Probe Storage Room (USCL4)**.....**60 NSF (5.6 NSM)**
Provide one if the total number of Transesophageal Echocardiograph Rooms is one or greater than one.

7. **Scrub / Gowning Area (LR003)**.....**60 NSF (5.6 NSM)**
Provide one if the total number of Cardiac Catheterization Laboratories is one or two; provide an additional one for every increment of two Cardiac Catheterization Laboratories greater than two.

8. **Cardiac CT / MRI (XCMRI)****400 NSF (37.2 NSM)**
Provide one per each Cardiac CT / MRI authorized.

9. **Toilet, Patient (TLTU1)****60 NSF (5.6 NSM)**
Minimum one; provide an additional one for each increment of eight Pacemaker ICD Interrogation Rooms, Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than eight.

E. FA 5: Invasive Cardiology Support Area:

1. **Instrument Room (XCCI1)**.....**100 NSF (9.3 NSM)**
Provide one per each Catheterization Laboratories and Transesophageal Echocardiograph Room.
2. **System Component Room (XCCA1)**.....**150 NSF (13.9 NSM)**
Provide one per each Catheterization Laboratories and Transesophageal Echocardiograph Room.
3. **Viewing Room (XVC01)**.....**120 NSF (11.1 NSM)**
Minimum one; provide an additional one for each increment of two Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than two.
4. **Supply Room, Sterile (ORSS1)**.....**180 NSF (16.7 NSM)**
Minimum one; provide an additional one for each increment of four Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than four.
5. **Equipment Cleaning Room (OREC1)**.....**120 NSF (11.1 NSM)**
Minimum one; provide an additional one for each increment of eight Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than eight.
6. **Digital Quality Control Area - PACS (XVC01)**.....**180 NSF (16.7 NSM)**
Provide one per each Catheterization Laboratories and Transesophageal Echocardiograph Room.
7. **Digital Archival Storage Room - PACS (XFDS1)**.....**140 NSF (13.0 NSM)**
Provide one if the total number of Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms is one or greater than one.
8. **Medication Area (MEDP2)**.....**80 NSF (7.4 NSM)**
Minimum NSF; provide an additional 40 NSF for each increment of eight Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than eight.

Allocated NSF can be decentralized to reduce travel distances for staff.
9. **Utility Room, Clean (UCCL1)**.....**80 NSF (7.4 NSM)**
Minimum NSF; provide an additional 40 NSF for each increment of eight Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than eight.

Allocated NSF can be decentralized to reduce travel distances for staff.
10. **Utility Room, Soiled (USCL1)**.....**100 NSF (9.3 NSM)**
Minimum NSF; provide an additional 40 NSF for each increment of eight Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than eight.

Allocated NSF can be decentralized to reduce travel distances for staff.

11. **Alcove, Crash Cart (RCA01)20 NSF (1.9 NSM)**
Provide one if the total number of Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms is three; provide an additional one per each Catheterization Laboratory greater than one; provide an additional two per each Transesophageal Echocardiograph Room greater than one.
12. **Alcove, Wheelchair/Stretcher (SRLW1).....60 NSF (5.6 NSM)**
Minimum one; provide an additional one for each increment of eight Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than eight.
13. **Storage, Clean Linen (LCCL1).....40 NSF (3.7 NSM)**
Minimum NSF; provide an additional 40 NSF for each increment of eight Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms greater than eight.
14. **Housekeeping Aides Closet - HAC (JANC1)60 NSF (3.7 NSM)**
Provide one if the total number of Cardiac Catheterization Laboratories, Electrophysiology Procedure Rooms, and Transesophageal Echocardiograph Rooms is one or greater than one.

F. FA 6: Invasive Cardiology Prep and Recovery Area:

1. **Recovery Cubicle, Patient Prep (RRSS1) 120 NSF (11.1 NSM)**
Provide three per each Cardiac Catheterization Laboratory, Electrophysiology Procedure Room, and Transesophageal Echocardiograph Room if Prep / Recovery Rooms are not authorized.

Prep / Recovery Cubicles can be combined with Prep / Recovery services of other departments as appropriate.
2. **Recovery Room, Patient Prep (RRSS1)..... 120 NSF (11.1 NSM)**
Provide three per each Cardiac Catheterization Laboratory, Electrophysiology Procedure Room, and Transesophageal Echocardiograph Room if authorized.

Prep / Recovery Rooms can be combined with Prep / Recovery services of other departments as appropriate.
3. **Toilet, Prep / Recovery Patient (TLTU1)60 NSF (5.6 NSM)**
Minimum two; provide an additional one for each increment of six Patient Prep / Recovery Cubicles or Patient Prep / Recovery Rooms greater than six.

A Patient Toilet must be easily accessible from the Patient Prep / recovery Area.
4. **Nurse Station (NSTA3) 60 NSF (5.6 NSM)**
Minimum NSF; provide an additional 60 NSF per each Nurse FTE authorized greater than two.

5. **Nourishment Station (NCWD2)**..... **60 NSF (5.6 NSM)**
Minimum NSF; provide an additional 60 NSF for each increment of nine Patient Prep / Recovery Cubicles or Patient Prep / Recovery Rooms greater than nine.

Allocated NSF can be decentralized to reduce travel distances for staff.

6. **Alcove, Crash Cart (RCA01)****20 NSF (1.9 NSM)**
Minimum one; provide an additional one for each increment of nine Patient Prep / Recovery Cubicles or Patient Prep / Recovery Rooms greater than nine.

7. **Storage, Equipment (SRE01)**.....**120 NSF (11.1 NSM)**
Minimum NSF; provide an additional 40 NSF for each increment of nine Patient Prep / Recovery Cubicles or Patient Prep / Recovery Rooms greater than nine.

G. FA 7: Staff and Administrative Area:

1. **Office, Chief of Cardiology (OFC01)****150 NSF (13.9 NSM)**
Provide one per Cardiovascular Laboratory Service.

2. **Secretary / Waiting (SEC01)****120 NSF (11.1 NSM)**
Provide one per Cardiovascular Laboratory Service.

3. **Office, Physician (OFD04)**.....**120 NSF (11.1 NSM)**
Provide one per each Physician FTE position authorized.

4. **Office, Nurse Manager (OFA01 / OFA02)**.....**120 NSF (11.1 NSM)**
Provide one per each Nurse Manager FTE position authorized.

5. **Office, Nurse Practitioner (OFD04)****120 NSF (11.1 NSM)**
Provide one per each Nurse Practitioner FTE position authorized; provide OFA01 if standard furniture is authorized or OFA02 if systems furniture is authorized.

6. **Conference Room (CRA02)****150 NSF (13.9 NSM)**
Provide one per Cardiovascular Laboratory Service.

7. **Team Work Room, Cardiology (WRCH1)**.....**120 NSF (11.1 NSM)**
Provide one per Cardiovascular Laboratory Service if authorized.

8. **Cubicle, Nurse (OFA03)****60 NSF (5.6 NSM)**
Provide one per each Nurse FTE authorized.

9. **Cubicle, Technician (OFA03)**.....**60 NSF (5.6 NSM)**
Provide one per each Technician FTE position authorized.

10. **Cubicle, Administration (OFA03)****60 NSF (5.6 NSM)**
Provide one per each Administration FTE position authorized.

11. **Copier / Printer Room (RPR01)****80 NSF (7.4 NSM)**
Provide one per Cardiovascular Laboratory Service.

12. **Storage, Forms / Literature (SRS01)**.....**80 NSF (7.4 NSM)**

Provide one per Cardiovascular Laboratory Service.

13. **Lounge, Staff (SL001)**..... **100 NSF (9.3 NSM)**
Minimum NSF; provide an additional 15 NSF for each FTE position working on peak shift greater than ten.
14. **Locker Room, Staff (LR002)** **60 NSF (5.6 NSM)**
Minimum NSF; provide an additional 10 NSF for each FTE position working on peak shift greater than ten.
15. **Toilet, Staff (TLTU1)** **60 NSF (5.6 NSM)**
Minimum one; provide an additional one for every increment of ten FTE positions authorized greater than ten.
16. **Cubicles, Provider Changing (LR003)** **60 NSF (5.6 NSM)**
Minimum one if authorized; provide an additional one for each whole increment of five FTE positions authorized greater than five.

Consider sharing Private Changing Cubicles with an adjacent department if fewer than five FTE positions are authorized.

H. FA 8: Education Area

The spaces below provide programming of educational spaces at department / service / chapter level. Alternatively, sum all departments/services data for Residency Program, and program space in Chapter 402 - Educational Facilities. Either / or – do not duplicate space.

1. **Office, Residency Program Director (OFA01)**..... **120 NSF (11.1 NSM)**
Provide one per Cardiovascular Laboratory Service if Residency Program is authorized.
2. **Cubicle, Intern / Resident / Fellow (OFA03)** **60 NSF (5.6 NSM)**
Provide one per each Intern, Resident, and Fellow FTE position authorized.

Combine cubicles into one room for staff and organizational efficiency.
3. **Conference / Classroom (CLR01)** **300 NSF (27.9 NSM)**
Provide one per Cardiovascular Laboratory Service if authorized.
4. **Library (LIBB1)**..... **140 NSF (13.0 NSM)**
Provide one per Cardiovascular Laboratory Service if authorized.
5. **Viewing Room (XVC01)** **80 NSF (7.4 NSM)**
Provide one per Cardiovascular Laboratory Service if authorized.

6 DESIGN CONSIDERATIONS

- A. Net-to-Department Gross factor (NTDG) for Cardiovascular Laboratory Service is **1.50**. This number, when multiplied by the programmed Net Square Feet (NSF) area, determines the Departmental Gross Square Feet (DGSF).
- B. Consider designing the Cardiovascular Laboratory Service within a model of service lines organized around Cardiology, commonly referred to as a Center of Excellence.
- C. Consideration should be given to adapting this suite to incorporate new technologies, such as Cardiac MRI, CT Angiography, and CT for stress testing.
- D. Consider grouping clinician workspaces into team room for multidisciplinary interaction.
- E. Separation of inpatient and outpatient traffic should be considered to the greatest extent possible. Provide outpatient Reception Area separate from inpatient circulation when both patient types utilize the same departmental facilities.
- F. Standardization of rooms and modular design should be considered to allow flexibility to adapt to new technologies and respond to changes in patient volumes.
- G. Connection to ancillary services, such as lab and pharmacy, should be considered.
- H. The waiting room should be connected to the patient entrance corridor and be under the visual control of the receptionist. This space can be shared between adjacent services where appropriate.
- I. Plan for locating the Patient Prep Rooms adjacent to patient waiting to reduce patient travel time/distance and increase staff responsiveness.
- J. Design should accommodate patient privacy and confidentiality in all areas, and in reception and patient care areas in particular. This includes visual and auditory considerations.
- K. Where possible, the department should be configured to limit the mix of patient and service functions, and to maintain clear separation of clean and dirty functions to avoid cross contamination. For example, Clean and Soiled Utility rooms can be located at alternate ends of a department.
- L. Corridors should be designed to a minimum of 8 feet clear width to accommodate passage of equipment or beds and two stretchers and/or wheelchairs. In non-patient areas and outpatient clinical spaces, corridors may be a minimum of 5 feet in clear width.
- M. Administration and support areas should be located and designed to maximize staff and space efficiency, and reduce staff travel distances.
- N. Plan for locating high volume services closer to patient waiting or building access points to decrease patient travel time/distance and increase staff responsiveness.

Services with longer duration procedure times or low volume generation can be less centrally located.

- O. Sharing of patient and staff support areas among adjacent services should be considered for efficient utilization of staff. For example, centralized check-in/check-out can reduce the total number of FTE's required to provide this function over multiple service lines.
- P. During design, NSF for Staff Lounge and Lockers may be combined with an adjacent department(s).
- Q. Verify room sizes and equipment layouts with equipment vendors prior to finalizing room layouts.
- 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.
- S. Refer to Design Guide for Cardiovascular Laboratory for a detailed discussion of functional and design considerations.

7 FUNCTIONAL RELATIONSHIPS

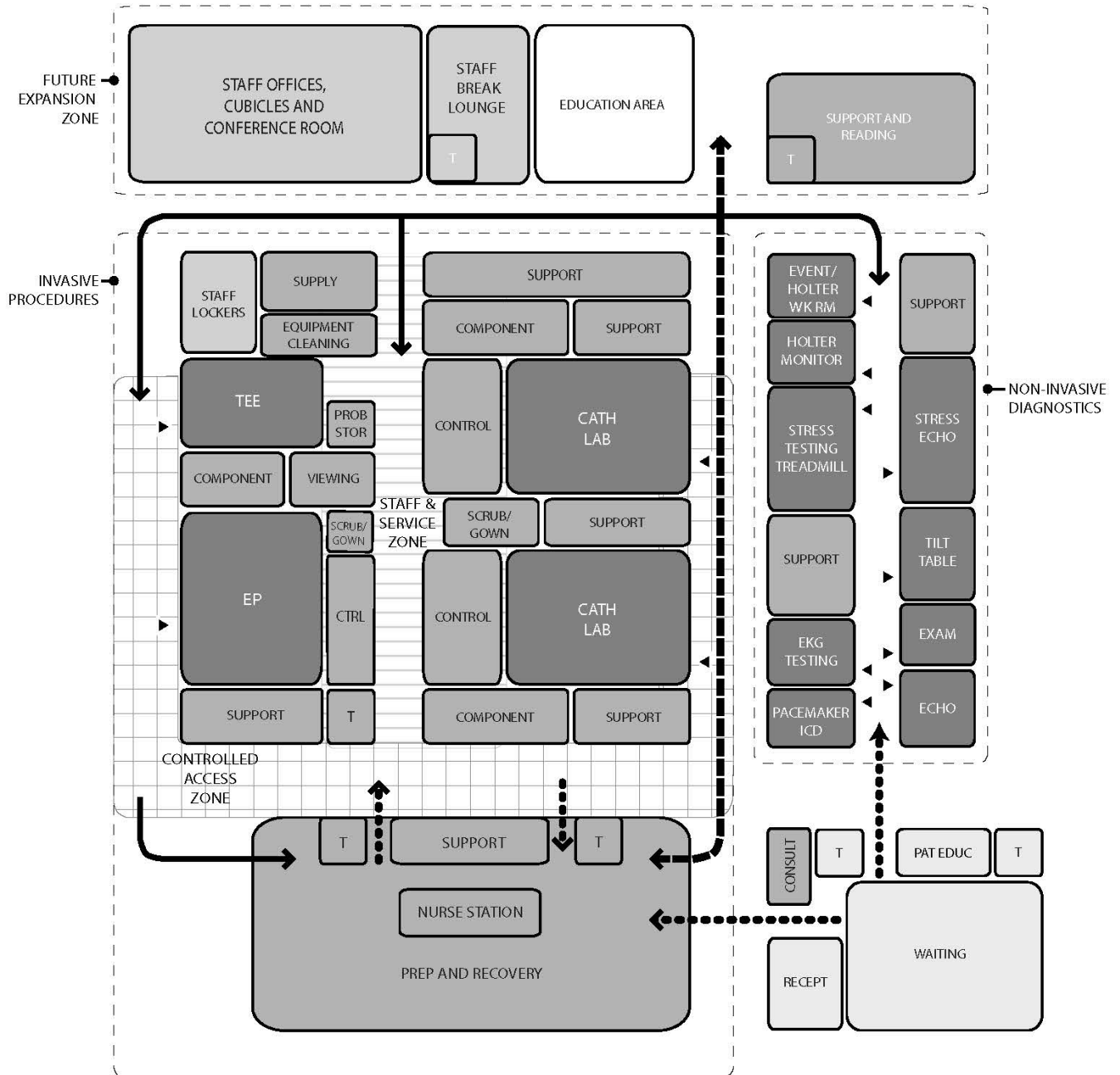
Relationship of Cardiovascular Laboratory Service to services listed below:

TABLE 2: FUNCTIONAL RELATIONSHIP MATRIX

SERVICES	RELATIONSHIP	REASON
ICU	3	C, I
MS&N Patient Care Units	3	C, I
Patient Prep and Recovery	1	C, I
Emergency Department	3	C, I
Main Entrance	3	H
Cardiovascular Labs	N	
Endoscopy	1	A
Ambulatory Surgery/ Minor Procedure	1	A
Radiology	1	C, I
Diagnostic Testing	1	C, I
Pulmonary Clinic / Testing	1	A, G, H
Cardiology Clinic / Testing	N	
Digestive Disease Clinic/Testing	N	
Neurology Clinic/Testing	N	
Ventilator Storage	N	
Respiratory Therapy	N	
Pharmacy	5	B
Laboratory	5	B
Social Work / Case Management	5	H
PT/OT	N	
Food Service / Kitchen	5	B
Sterile Processing Department (SPD)	3	C
Staff On-Call Rooms	3	C
Linen Storage	5	B
Waste Management	5, X	B, E, F
Loading Dock	5	B, D

LEGEND	
Relationship:	Reasons: (Use as many as appropriate)
1. Adjacent	A. Common use of resources
2. Close / Same Floor	B. Accessibility of supplies
3. Close / Different Floor Acceptable	C. Urgency of contact
4. Limited Traffic	D. Noise or vibration
5. Connection Needed	E. Presence of odors or fumes
N. Not Applicable	F. Contamination hazard
X. Separation Desirable	G. Sequence of work
	H. Patient's convenience
	I. Frequent contact
	J. Need for security
	K. Closeness inappropriate
	L. Interference

8 FUNCTIONAL DIAGRAM



LEGEND

- | | | | |
|--|-------------------------------|--|----------------|
| | EXAM/ TESTING/ PROCEDURE | | STAFF/ SERVICE |
| | PREP/ RECOVERY/ SUPPORT | | OUTPATIENT |
| | STAFF AND ADMINISTRATIVE AREA | | INPATIENT |
| | RECEPTION AREA | | PATIENT ENTRY |
| | EDUCATION AREA | | |