

## CHAPTER 210: 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

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 insure 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).

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.

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.

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.

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.

Cardiology: The study of the heart and its functions.

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.

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.

Electrocardiogram (EKG): A test that records the electrical activity of the heart, shows abnormal rhythms (arrhythmias or dysrhythmias), and detects heart muscle damage.

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.

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.

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.

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.

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.

Invasive Cardiology: Procedures that include all invasive cardiac related services such as Cardiac Catheterization, Therapeutic Cardiovascular Procedures, Electrophysiology (EP) and Pacemaker Implantation.

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.

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).

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.

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.

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 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.

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.

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.

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.

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 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.

#### 4 INPUT DATA STATEMENTS

##### A. Mission Input Data Statements

1. Is a Patient Check-In Kiosk authorized? (M)
2. Is a Cardiovascular Laboratory Service Residency Program authorized? (M)
  - a. How many Intern FTE positions are authorized? (S)
  - b. How many Resident FTE positions are authorized? (S)
  - c. How many Fellow FTE positions are authorized? (S)

##### B. Workload Input Data Statements

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

##### C. Staffing Input Data Statements

1. How many EKG Technician FTE positions, greater than two, are authorized? (S)
2. How many Nurse FTE positions are authorized? (S)
3. How many Physician FTE positions are authorized? (S)
4. How many Nurse Manager FTE positions are authorized? (S)
5. How many Nurse Practitioner FTE positions are authorized? (S)

6. How many Technician FTE positions are authorized? (S)
7. How many Administrative FTE positions are authorized? (S)

D. Miscellaneous Input Data Statements

1. How many Holter Monitor Rooms are authorized? (Misc)
2. How many Echocardiograph Rooms are authorized? (Misc)
3. How many Stress Echocardiograph Rooms are authorized? (Misc)
4. How many Tilt Table Testing Rooms are authorized? (Misc)
5. How many Cardiac CT / MRI Rooms are authorized? (Misc)

## 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 (WTG02)..... 45 NSF (4.2 NSM)**  
*Provide one if the projected number of Exam / Procedure / Testing Rooms (of all types) is one; provide WTG04 if the projected number of Exam / Procedure / Testing Rooms (of all types) is two; provide WTG06 if the projected number of Exam / Procedure / Testing Rooms (of all types) is three; provide WTG08 if the projected number of Exam / Procedure / Testing Rooms (of all types) is four; provide WTG10 if the projected number of Exam / Procedure / Testing Rooms (of all types) is five; provide WTG12 if the projected number of Exam / Procedure / Testing Rooms (of all types) is six; provide WTG14 if the projected number of Exam / Procedure / Testing Rooms (of all types) is seven; provide WTG16 if the projected number of Exam / Procedure / Testing Rooms (of all types) is eight; provide WTG18 if the projected number of Exam / Procedure / Testing Rooms (of all types) is nine; provide WTG20 if the projected number of Exam / Procedure / Testing Rooms (of all types) is ten; provide WTG22 if the projected number of Exam / Procedure / Testing Rooms (of all types) is eleven; provide WTG24 if the projected number of Exam / Procedure / Testing Rooms (of all types) is twelve; provide WTG26 if the projected number of Exam / Procedure / Testing Rooms (of all types) is thirteen; provide WTG28 if the projected number of Exam / Procedure / Testing Rooms (of all types) is fourteen; provide WTG30 if the projected number of Exam / Procedure / Testing Rooms (of all types) is fifteen; provide WTG32 if the projected number of Exam / Procedure / Testing Rooms (of all types) is sixteen; provide WTG34 if the projected number of Exam / Procedure / Testing Rooms (of all types) is seventeen; provide WTG36 if the projected number of Exam / Procedure / Testing Rooms (of all types) is eighteen; provide WTG38 if the projected number of Exam / Procedure / Testing Rooms (of all types) is nineteen; provide WTG40 if the projected number of Exam / Procedure / Testing Rooms (of all types) is twenty.*

The Cardiovascular Laboratory Service Exam / Procedure / Testing Rooms are:

- a. Pacemaker ICD Interrogation Room,
- b. EKG Testing Room,
- c. Cardiology Exam Room,
- d. Holter Monitor Room,
- e. Echocardiograph Room,
- f. Stress Echocardiograph Room,
- g. Stress Testing Treadmill Room,
- h. Tilt Table Testing Room, and

i. Cardiac CT / MRI Rooms.

WTG02: Allocated NSF accommodates one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total two people.

WTG04: Allocated space accommodates two standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total four people.

WTG06: Allocated space accommodates four standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total six people.

WTG08: Allocated space accommodates six standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total eight people.

WTG10: Allocated space accommodates eight standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total ten people.

WTG12: Allocated space accommodates ten standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total twelve people.

WTG14: Allocated space accommodates twelve standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total fourteen people.

WTG16: Allocated space accommodates twelve standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total sixteen people.

WTG18: Allocated space accommodates fourteen standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total eighteen people.

WTG20: Allocated space accommodates sixteen standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total twenty people.

WTG22: Allocated space accommodates eighteen standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total twenty-two people.

WTG24: Allocated space accommodates twenty standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total twenty-four people.

WTG26: Allocated space accommodates twenty standard chairs @ 9 NSF each, three bariatric chairs @ 14 NSF each, three accessible spaces @ 10 NSF each, and circulation; total twenty-six people.

WTG28: Allocated space accommodates twenty-two standard chairs @ 9 NSF each, three bariatric chairs @ 14 NSF each, three accessible spaces @ 10 NSF each, and circulation; total twenty-eight people.

WTG30: Allocated space accommodates twenty-four standard chairs @ 9 NSF each, three bariatric chairs @ 14 NSF each, three accessible spaces @ 10 NSF

each, and circulation; total thirty people.

WTG32: Allocated space accommodates twenty-six standard chairs @ 9 NSF each, three bariatric chairs @ 14 NSF each, three accessible spaces @ 10 NSF each, and circulation; total thirty-two people.

WTG34: Allocated space accommodates twenty-eight standard chairs @ 9 NSF each, three bariatric chairs @ 14 NSF each, three accessible spaces @ 10 NSF each, and circulation; total thirty-four people.

WTG36: Allocated space accommodates twenty-eight standard chairs @ 9 NSF each, four bariatric chairs @ 14 NSF each, four accessible spaces @ 10 NSF each, and circulation; total thirty-six people.

WTG38: Allocated space accommodates thirty standard chairs @ 9 NSF each, four bariatric chairs @ 14 NSF each, four accessible spaces @ 10 NSF each, and circulation; total thirty-eight people.

WTG40: Allocated space accommodates thirty-two standard chairs @ 9 NSF each, four bariatric chairs @ 14 NSF each, four accessible spaces @ 10 NSF each, and circulation; total forty people.

**2. Reception (RCP02) ..... 260 NSF (24.2 NSM)**

*Provide one for the Cardiovascular Laboratory Service.*

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

**3. Kiosk, Patient Check-In (RCHK2) ..... 105 NSF (9.8 NSM)**

*Provide one if a Patient Check-in Kiosk is authorized.*

Allocated NSF accommodates two display kiosks, patient privacy area and circulation.

**4. Workstation, Patient Education (CLSC1) ..... 40 NSF (3.8 NSM)**

*Provide one for the Cardiovascular Laboratory Service.*

This space is intended to be used for medical information resource material for patients and visitors. Locate accessible to waiting.

**5. Toilet, General (TNP01) ..... 60 NSF (5.6 NSM)**

*Provide two for the Cardiovascular Laboratory Service.*

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: Non-Invasive Cardiology Patient Area:**

**1. EKG Testing Room (OPEC1) ..... 150 NSF (14.0 NSM)**

*Provide one for every increment of 4,800 annual EKG clinic stops (Stop Code 107) projected; minimum annual workload projected to provide a room is 1,440 (see Table 1).*

**2. Exam Room, Cardiology (EXRC1) ..... 120 NSF (11.2 NSM)**

*Provide one for every increment of 2,133 annual Cardiology clinic stops (Stop Code 303) projected; minimum annual workload projected to provide a room is 640 (see Table 1).*



3. **Pacemaker ICD Interrogation Room (EXRC2)**..... **120 NSF (11.2 NSM)**  
*Provide one for every increment of 3,200 annual Pacemaker clinic stops (Stop Code 311) projected; minimum annual workload projected to provide a room is 960 (see Table 1).*
4. **Holter Monitor Room (OPHM1)**..... **150 NSF (14.0 NSM)**  
*Provide one per each Holter Monitor Room authorized.*
5. **Echocardiograph Room (OPPE1)**..... **150 NSF (14.0 NSM)**  
*Provide one per each Echocardiograph Room authorized.*
6. **Stress Echocardiograph Room (OPPE2)**..... **300 NSF (27.9 NSM)**  
*Provide one per each Stress Echocardiograph Room authorized.*
7. **Stress Testing Treadmill Room (OPTM1)**..... **300 NSF (27.9 NSM)**  
*Provide one for every increment of 1,280 annual Cardiac Stress Test clinic stops (Stop Code 334) projected; minimum annual workload projected to provide a room is 384 (see Table 1).*
8. **Tilt Table Testing Room (OPTM2)** ..... **180 NSF (16.8 NSM)**  
*Provide one per each Tilt Table Testing Room authorized.*
9. **Consult Room (OFDC2)** ..... **120 NSF (11.2 NSM)**  
*Provide two for the 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. **Reading Station, EKG (XVC01)**..... **120 NSF (11.2 NSM)**  
*Provide one if at least one EKG Testing Room is generated.*
12. **Toilet, Patient (TPG01)** ..... **60 NSF (5.6 NSM)**  
*Minimum one for Non-Invasive Cardiology; provide an additional one for every increment of six Pacemaker ICD Interrogation Rooms, EKG Testing Rooms, Cardiology Exam Rooms, Holter Monitor Rooms, Echocardiograph Rooms, Stress Echocardiograph Rooms, Stress Testing Treadmill Rooms, Tilt Table Testing and Consult Rooms greater than six.*

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

**C. FA 3: Non-Invasive Cardiology Support Area:**

1. **Utility Room, Clean (UCCL1)** ..... **120 NSF (11.2 NSM)**  
*Provide one for Non-Invasive Cardiology.*
2. **Utility Room, Soiled (USCL1)** ..... **120 NSF (11.2 NSM)**  
*Provide one for Non-Invasive Cardiology.*
3. **Workroom, Event / Holter Monitor (OPHM1)** ..... **160 NSF (14.9 NSM)**  
*Minimum NSF; provide an additional 80 NSF per each additional EKG FTE Technician position authorized greater than two.*

4. **Storage, Non-Invasive Cardiology Supplies (SRSE1) ..... 120 NSF (11.2 NSM)**  
*Minimum NSF; provide an additional 40 NSF for every 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.*
5. **Storage, ICD Equipment (SRSE1) ..... 120 NSF (11.2 NSM)**  
*Minimum NSF; provide an additional 40 NSF for every 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.*
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.*
7. **Alcove, Crash Cart (RCA01) ..... 20 NSF (1.9 NSM)**  
*Provide one for Non-Invasive Cardiology.*
8. **Alcove, Wheelchair / Stretcher (SRLW1) ..... 60 NSF (5.6 NSM)**  
*Minimum one; 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 for Non-Invasive Cardiology.*

**D. FA 4: Invasive Cardiology Patient Area:**

1. **Cardiac CT / MRI Room (XCMRI) ..... 400 NSF (37.2 NSM)**  
*Provide one per each Cardiac CT / MRI Room authorized.*
2. **Toilet, Patient (TPG01) ..... 60 NSF (5.6 NSM)**  
*Provide one if one or more Cardiac CT / MRI Rooms is authorized.*

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

The following rooms formerly located in this Functional Area are now located in PG-18-9: 286 Inpatient Surgical / Endovascular Services and Ambulatory Surgical Service; Functional Area 6: Inpatient Surgical Facility Endovascular Service Patient Area:

Cardiac Catheterization Laboratory,  
Control Room, Cardiac Catheterization,  
Procedure Room, Electrophysiology,  
Control Room, Electrophysiology,  
Transesophageal, Echocardiograph,  
Storage, TEE Probe, and  
Scrub / Gowning Area.

**E. FA 5: Invasive Cardiology Support Area:**

1. **Alcove, Crash Cart (RCA01)** ..... 20 NSF (1.9 NSM)  
*Provide one for Invasive Cardiology.*
2. **Alcove, Wheelchair / Stretcher (SRLW1)**..... 60 NSF (5.6 NSM)  
*Provide one for Invasive Cardiology.*
3. **Storage, Clean Linen (LCCL1)**..... 80 NSF (7.5 NSM)  
*Provide one for Invasive Cardiology.*
4. **Housekeeping Aides Closet (HAC) (JANC1)**..... 60 NSF (5.6 NSM)  
*Provide one for Invasive Cardiology.*

The following rooms formerly located in this Functional Area are now located in PG-18-9: 286 Inpatient Surgical / Endovascular Services and Ambulatory Surgical Service; Functional Area 6: Inpatient Surgical Facility Endovascular Service Patient Area or Functional Area 9: Inpatient Surgical Facility Support Area:

Instrument Room,  
System Component Room,  
Viewing Room,  
Supply Room, Sterile,  
Surgical Facility Clean Core Area,  
Equipment Cleaning Room,  
Digital Quality Control Area – PACS,  
Digital Archival Storage Room – PACS,  
Medication Room,  
Utility Room, Clean,  
Utility Room, Soiled,  
Lounge, Staff,  
Locker Room, Male Staff,  
Toilet / Shower, Male Staff,  
Locker Room, Female Staff,  
Toilet / Shower, Female Staff.

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

The following rooms formerly located in this Functional Area are now located in PG-18-9: 286 Inpatient Surgical / Endovascular Services and Ambulatory Surgical Service; Functional Area 3: Inpatient Surgical Facility Pre-Operative Holding / Phase II Recovery Patient Area:

Recovery Room, Patient Prep,  
Recovery Cubicle, Patient Prep,  
Toilet, Prep / Recovery Patient,  
Nurse Station,  
Alcove, Nourishment Station,  
Alcove, Crash Cart, and  
Storage, Equipment

**G. FA 7: Staff and Administrative Area:**

1. **Office,  
Cardiovascular Laboratory Service Chief (OFA09)** ..... 100 NSF (9.3 NSM)  
*Provide one for the Cardiovascular Laboratory Service.*
2. **Waiting (WTG03)**..... 80 NSF (7.5 NSM)  
*Provide one for the Cardiovascular Laboratory Service.*

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

3. **Workstation, Secretary (OFA07)** ..... 56 NSF (5.3 NSM)  
*Provide one for the Cardiovascular Laboratory Service.*
4. **Workstation, Physician (OFA07)** ..... 56 NSF (5.3 NSM)  
*Provide one per each Physician FTE position authorized.*
5. **Office, Nurse Manager (OFA09)** ..... 100 NSF (9.3 NSM)  
*Provide one per each Nurse Manager FTE position authorized.*
6. **Workstation, Nurse Practitioner (OFA07)**..... 56 NSF (5.3 NSM)  
*Provide one per each Nurse Practitioner FTE position authorized.*
7. **Workstation, Nurse (OFA07)**..... 56 NSF (5.3 NSM)  
*Provide one per each Nurse FTE position authorized.*
8. **Workstation, Technician (OFA07)**..... 56 NSF (5.3 NSM)  
*Provide one per each Technician FTE position authorized.*
9. **Workstation, Administration (OFA07)**..... 56 NSF (5.3 NSM)  
*Provide one per each Administrative Clerk FTE position authorized.*
10. **Conference Room (CFR01)**..... 240 NSF (22.3 NSM)  
*Provide one for the Cardiovascular Laboratory Service.*

Allocated NSF accommodates six conference chairs @ 7.5 NSF each, two 5'-0" x 2'-0" tables at 10 NSF each, one credenza @ 8 NSF, and circulation; total six people.

11. **Workroom, Cardiology Team (WRCH1)**..... 120 NSF (11.2 NSM)  
*Provide one for the Cardiovascular Laboratory Service.*
12. **Copier / Printer Room (RPR01)** ..... 80 NSF (7.5 NSM)  
*Provide one for the Cardiovascular Laboratory Service.*
13. **Storage, Forms / Literature (SRS01)**..... 80 NSF (7.5 NSM)  
*Provide one for the Cardiovascular Laboratory Service.*
14. **Toilet, Staff (TNPg1)**..... 60 NSF (5.6 NSM)  
*Provide one for the Cardiovascular Laboratory Service.*

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

**H. FA 8: Education Area:**

The spaces below provide programming of educational spaces at department / service level.

1. **Office, Residency Program Director (OFA09)**..... 100 NSF (9.3 NSM)  
*Provide one if a Cardiovascular Laboratory Service Residency Program is authorized.*
2. **Workstation, Intern / Resident / Fellow (OFA07)**..... 56 NSF (5.3 NSM)  
*Provide one per each Intern, Resident, and Fellow FTE position authorized if a Cardiovascular Laboratory Service Residency Program is authorized.*
3. **Training Room, Resident (CFR01)** ..... 240 NSF (22.3 NSM)  
*Provide one if a Cardiovascular Laboratory Service Residency Program is authorized.*

Allocated NSF accommodates six conference chairs @ 7.5 NSF each, two 5'-0" x 2'-0" tables at 10 NSF each, one credenza @ 8 NSF, and circulation; total six people.

## 6 PLANNING AND 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 grouping clinician workspaces into a team room for multidisciplinary interaction.
- C. Separation of inpatient and outpatient traffic should be considered to the greatest extent possible. Provide Reception Check-in for outpatient separate from inpatient circulation when both patient types utilize the same departmental facilities.
- D. Standardization of rooms and modular design should be considered to allow flexibility to adapt to new technologies and respond to changes in patient volumes.
- E. Connection to ancillary services, such as lab and pharmacy, should be considered.
- F. The waiting room should be connected to the patient entrance corridor and be under the visual control of Reception / Check-in. This space can be shared between adjacent services where appropriate.
- G. 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.
- H. 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.
- I. 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.
- J. Administration and support areas should be located and designed to maximize staff and space efficiency, and reduce staff travel distances.
- K. 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.
- L. 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.
- M. During design, NSF for Staff Lounge and Lockers may be combined with an adjacent department(s).
- N. Verify room sizes and equipment layouts with equipment vendors prior to finalizing room layouts.

- O. Refer to Department of Veterans Affairs (VA) Office of Construction and Facilities Management Technical Information Library ([www.cfm.va.gov/til/](http://www.cfm.va.gov/til/)) for additional technical criteria.
- P. 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:

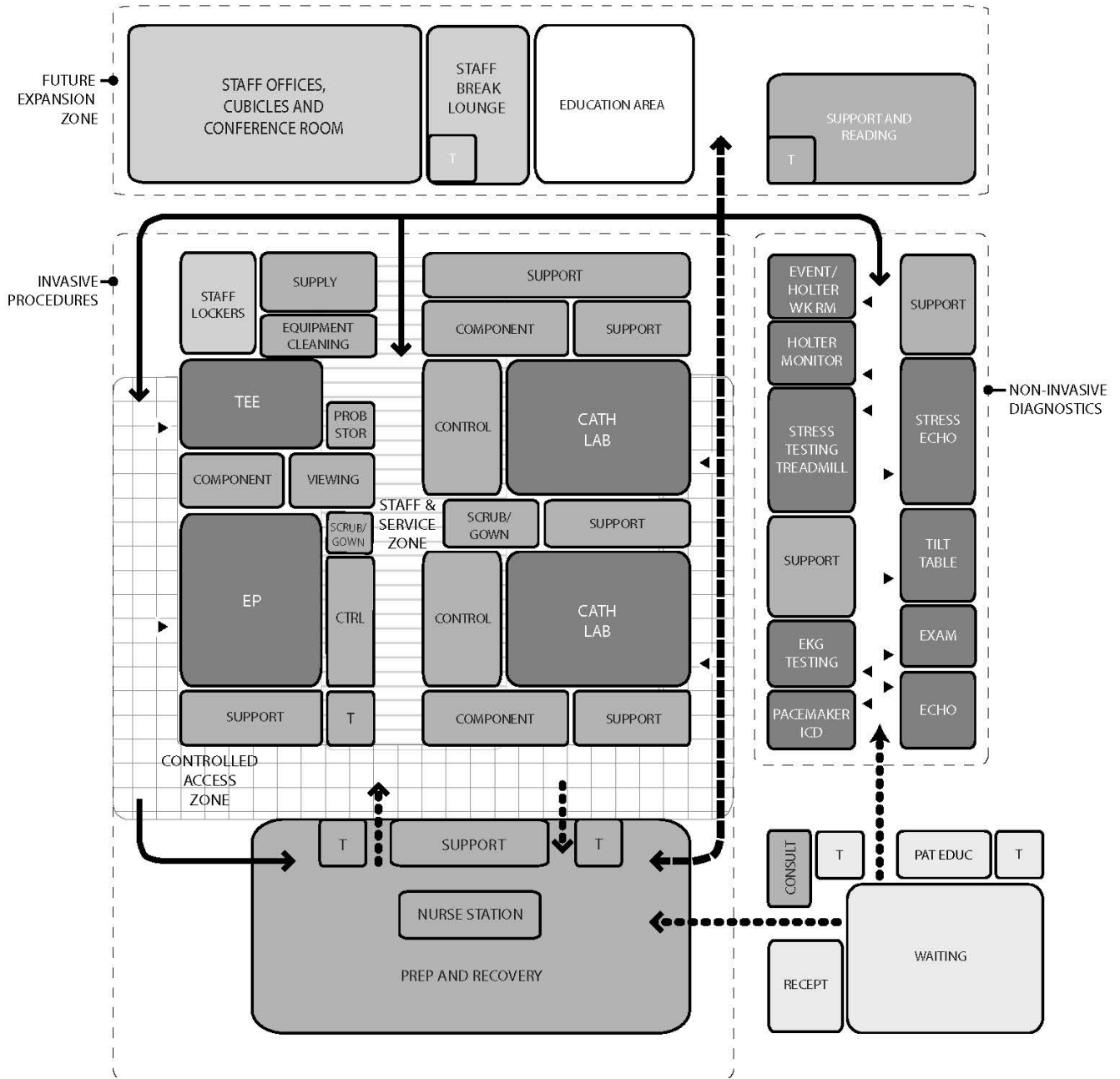
Relationship:

1. Adjacent
2. Close / Same Floor
3. Close / Different Floor Acceptable
4. Limited Traffic
5. Connection Needed
- X. Not Applicable
- Y. Separation Desirable

Reasons:

- A. Common use of resources
- B. Accessibility of supplies
- C. Urgency of contact
- D. Noise or vibration
- E. Presence of odors or fumes
- F. Contamination hazard
- G. Sequence of work
- H. Patient 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                |  |                |