

## **Section 2**

### **Narrative**

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# General Considerations

## Narrative

### Overview:

#### ***Current Directions:***

Pulmonary and Critical Care Medicine are usually a single section in most larger VA Medical Centers. This guide deals with Pulmonary diagnostic and therapeutic aspects of the specialty, but not Critical Care, which is included under Intensive Care guidelines.

Pulmonary Medicine includes Respiratory Care and its components, which include treatment and diagnostic studies, ventilator management, Pulmonary Function Testing (including Blood Gas analysis), Pulmonary Exercise Testing, and Invasive Pulmonary Procedures (including bronchoscopy, its sub-components, and transthoracic diagnostic procedures). Sleep Disorders Centers are often included in Pulmonary Medicine, although sometimes these centers may be jointly or separately managed by Neurology or Psychiatry Services.

Other areas of activities will include an outpatient exam and/or treatment area, support space for therapists working with inpatient units, and support space for home care programs.

#### ***Future Trends:***

Pulmonary Medicine should be integrated with non-invasive cardiology services for patient convenience and for opportunities for cross-training of staff.

Universal patient exam rooms (wherever possible) will be developed for greater efficiency in addressing shifting patient volumes.

Hospital information systems will be integrated for improved access to patient information from remote locations.

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### Operations:

#### **Services:**

Diagnostic services are conducted on both inpatients and outpatients, using a range of equipment.

Outpatient diagnostic services tend to be administered within the department and may be administered within the ordering service, such as the Emergency Room or the Ambulatory Clinic.

Stress testing and sleep studies tend to be performed within the department due to the technologically intensive nature of these studies.

Respiratory care services, including equipment supply and reprocessing are provided to all areas of the hospital placing particular importance on the ER Intensive Care Units and on the Surgical Recovery Nursing Units.

Education for patients and their families and equipment maintenance for home services are gaining importance with the decrease in length of hospital stay and increase in patient and family roles in the care process.

#### **Patient Care Concept:**

As mentioned above, the patient and the family are included as a members of the care team. This increases the importance of the educational role of Pulmonary Medicine.

With this patient-focused care in mind, the core facilities and staff serve as cross-trained resources for therapeutic services throughout the hospital. Pulmonary Medicine can be the ideal model of this concept.

#### **Level of Care (consider trends):**

Pulmonary Medicine requires a wide array of specialized portable equipment. The volume of service may support duplicating facilities in inpatient and ambulatory care settings. Therefore, Pulmonary Medicine should be located near hospital and ambulatory care based sites or satellites.

Outpatient use comprises the majority of the department's diagnostic workload, which does not require a hospital setting.

VA Pulmonary Medicine facilities are focused upon serving the Veteran, and may include sharing agreements, joint ventures, referrals and efforts to include the veteran's family as well as the general public.

#### **Medical Records:**

In the near future, the increased use of the electronic medical records will make paper records of much less importance. Image capture and imaging stations will also become increasingly important.

#### **Patient Protocol:**

Remote services may require storage space for mobile equipment, which can be located within the department or within the unit served.

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### ***Special Requirements:***

Teaching facilities and facilities with high levels of cross-training will require more technical support space for teaching and demonstration. This space can be either within the department or within the using service.

The need for respiratory care is closely tied to the acuity level of the patients served.

Equipment support services, using services, equipment processing, and maintenance functions should be integrated between the core department in large hospitals with high levels of patient care and in the satellite facilities.

### **Space Planning Issues:**

#### ***Flexibility:***

The technical space requirements to accommodate Pulmonary Medicine do not impose special constraints on the siting of the facilities.

Procedure Rooms are sometimes combined into larger spaces to increase flexibility, but this occurs at the expense of patient privacy.

Patient and procedure volumes should be considered upon the decision to move equipment or patients receiving multiple procedures.

Special considerations are required for sleep study areas. They may include needs for acoustical privacy, data communications, and specific lighting requirements.

#### ***Efficiency:***

Shared support and technical staff cross-training and coordination are common for respiratory therapy. It is increasingly possible for diagnostic procedures to be accomplished in general exam settings.

Interface of proprietary imaging packages and Image Capture capability of DHCP are currently in place in some VA centers.

#### ***Human Factors:***

An inherent opportunity exists in the design of Pulmonary Medicine Facilities to address human needs and put forth creative solutions that enhance patient comfort and contribute to positive outcomes.

A prime objective should be to de-emphasize the institutional image of traditional health care facilities and to surround the patient (and family members) with a familiar and non-threatening environment. Architectural finishes and furnishings can help to achieve this goal.

Good planning and design appeal to the spirit and sensibilities of patients and care providers alike.

Pulmonary Medicine facilities should be healing environments that allow the building itself to become part of the therapy with the technical requirements being addressed in an integrated manner that supports these concepts.

Patient privacy can be accommodated without sacrificing facility utilization.

Security is addressed through planning, design, and detail considerations.

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Handicapped access is accommodated by the application of UFAS and ADA design standards to space and fixed equipment layouts.

### Functional Space Relationships:

#### **Work Flow:**

##### Patient:

A singular point of control for inpatients and outpatients can be provided while maintaining convenient outpatient access.

The patient process flows from registration and waiting/holding, to gowning (if required), to procedure rooms, and then back to waiting for discharge.

The blood gas analysis room may be within the Pulmonary Function area, or at a location suitable for providing hospital-wide service. Some centers will have more than one such lab to improve traffic flow.

The Sleep Study Disorders Center will be removed from traffic flow for noise control. There will be visual (CCTV), voice (intercom), and data communication between the staff work area and the patient sleep rooms. Some of the studies will be nocturnal of eight hour duration. Other sleep studies, such as the Multiple Sleep Latency Test (MSLT) and Maintenance Wakefulness Test (MWT), are performed during the day.

The existence of more than one lab improves traffic control. The sleep study spaces are organized in a suite with data communications connecting the staff work area (Diagnostic Room) and the patient sleep rooms.

Sleep rooms must have provision for connecting polygraphic equipment, gas cylinders, CPAP hoses, and other monitoring devices to the staff work area (Diagnostic Room).

##### Special Entry:

A side entrance may be required for late night access.

##### Staff and Administrative Functions:

Staff and Administrative areas are not located within patient traffic areas.

Staff functions may be located within the department or in a convenient location shared with another department

##### Patient Records:

The increase of the use of electronic records will make transport of records less crucial in the near future. High speed printers (to print previous DHCP progress notes) and action profiles should be in place.

##### Specimens:

Blood gas samples may be received by the blood gas lab. Outpatient samples are usually drawn in the blood gas lab rather than necessitating transport of the samples.

##### Clean and Soiled Materials:

Respiratory Care cleans, services, and provides user maintenance to Respiratory equipment.

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The equipment is tested and sanitized before being moved to a clean storage area.

Physical separation of clean and soiled equipment must be maintained throughout the process, avoiding the crossing of clean and soiled work flows.

The equipment processing areas must be located where they are accessible to all serviced units, including the procedure spaces within the department. This must be accomplished without interfacing patient traffic.

Locate additional clean and soiled utility functions close to the supported patient areas they support but away from patient traffic.

### ***Organizational Concepts:***

#### Functional Layering:

Reception is located to control access to the patient areas and to secure Pulmonary Medicine from unauthorized access. Patient records are also usually received in and distributed from this area.

Patient areas are consolidated to control patient access and to maintain patient privacy, security, and dignity. High-frequency short- duration exams are near the reception area.

Staff Support Areas are consolidated in a core to assure quality, staff efficacy, patient record security and patient privacy.

Administrative areas include reading, interpretation, and consultation spaces that are accessible to the physicians. Consultation and interpretation areas are not accessed by patients to provide private staff work areas.

Sleep Study areas are located away from traffic, sources of electrical interference, microwave, or other RF noise.

Equipment processing is located where it is accessible from outside areas without having to traverse the department.

#### Building Systems Integration:

Pulmonary Medicine does not impose severe demands on special building integration.

Special studies, such as bronchoscopies and inhalation therapies may demand environmental investigation, as they require special isolation due to Tuberculosis or the AIDS virus.

#### Staff Utilization and Cross-Training:

Pulmonary Medicine provides training services to nursing and medical staff and also coordinates services with the staff of all units served.

Stress Testing activities of Pulmonary Medicine, Nuclear Medicine, Cardiology and Ultrasound should be consolidated wherever possible.

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### ***Location/External Relationships:***

#### Patient Access/Wayfinding:

Pulmonary Medicine facilities should be accessibly located to parking and ambulatory care areas, since it provides outpatient diagnostic procedures.

A location proximate to other diagnostic facilities assists in wayfinding and coordination of patient services.

A location central to inpatient and non-ambulatory facilities is required to provide stat access to all inpatient units.

#### Functional Adjacencies:

Programs that benefit from (but do not require) adjacency to Pulmonary Medicine are intensive care, emergency, and surgery recovery.

However, the blood gas laboratory should have reasonable proximity to the ICUs, ER, OR, and PACU.

#### Services Access:

General hospital service access is adequate.

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### Architectural:

#### ***Interior Materials and Finishes:***

##### Partitions:

Interior partitions should primarily be painted gypsum wallboard on metal stud construction. Partitions around physician offices, exam rooms, and treatment rooms should have sound attenuation batts between the studs in accordance with VA Construction Standard 34-1, "Noise Transmission Control".

##### Floors:

Floors in offices, conference rooms, and waiting areas should be carpeted with a 100 mm (4") high resilient base.

Floors in toilet rooms should be ceramic tile with a ceramic tile base.

Floors in exam rooms, treatment rooms, and most other spaces should be vinyl composition tile with a 100 mm (4") high resilient base.

##### Ceiling:

Ceilings should primarily be lay-in acoustic ceiling tile systems.

##### Protection:

Electrical shielding (Faraday Cage) surrounding the sleep rooms is sometimes required to decrease electrical interference. This is particularly true when the sleep unit is serving the hospital as a full-service sleep disorders center.

Wall and Corner guards should be used in corridors and other areas where wall damage from cart traffic is anticipated.

#### ***Interior Doors and Hardware:***

Interior doors should be 45 mm (1¾") thick solid-core flush panel wood doors or hollow metal doors in hollow metal frames.

Doorjambes should have hospital-type sanitary stops that terminate 200 mm (8") from the floor to facilitate mopping. Hollow metal doors should be used where high impact is a concern and where fire-rating is required.

Kick/mop plates should generally be applied to both sides of the doors. Handicapped accessible hardware should be used throughout the facility.

Refer to VA Handbook PG-18-14, "Room Finishes, Door, and Hardware Schedule" for additional information.

### Equipment:

#### ***Casework:***

Casework systems should be chosen to provide flexibility for planning and utilization purposes.

Casework systems should incorporate components dimensioned for ease of multiple re-use applications.

Casework systems should be planned to avoid corner installations and filler panels.

#### ***Information Management Systems:***

Work stations for OE/RR are required in administrative areas and also in each provider's office. Imaging stations should also be available if the facility has the capability.

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Management Systems shall include elements of patient registrations, patient charges, physician's order entry, and patient /staff movement.

These systems' elements will require access to the main facility's "information backbone", and to the departmental Local Area Network (LAN). All components should be planned for compatibility.

### ***Sleep Studies:***

Sleep rooms and the necessary monitoring rooms should be located in a traffic controlled area away from noise producing equipment (trash removal, mechanical rooms, etc.).

Video studies will be performed using infrared recording techniques. Provide in-room infrared light source(s).

These video studies require a variety of types of equipment. Sufficient storage area should be planned adjacent to sleep study areas.

Hospital public address intercoms should be able to switch to "off" in the sleep rooms and also be able to lower the volume in the Diagnostic Room so as not to awaken patients during studies. Pass-through holes are needed between Diagnostic Room and sleep rooms.

## Heating, Ventilation, and Air Conditioning:

### ***Operation:***

Air conditioning systems should be provided to heat, cool, and ventilate the individual spaces, as required to satisfy the VA design criteria.

The air conditioning systems serving the Pulmonary Medicine Service should be designed to operate at full capacity to suit the schedule of the service.

### ***Capacities:***

The number of people and the air conditioning load noted on the room design standard sheet is for purposes of establishing the design guide basis and its use in planning. The engineers and/or designers should verify the actual number of people and the air conditioning load to agree with the project requirements.

The percent of outside air should be based on the space total supply air quantities.

Verify equipment A.C. loads shown as per actual equipment furnished on a project.

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### ***Air Quality and Distribution:***

Follow TB Criteria in HVAC Design Manual for Hospital Projects. In general, clean areas shall have positive air pressure and soiled areas should have negative air flow with respect to the adjoining areas.

The transfer air should not be more than 2.8m<sup>3</sup>/min (100 CFM) per undercut door.

Care should be taken to minimize the short-circuiting of air between supply and return/exhaust openings in interior spaces.

Temperature Controls in Sleep Study areas are critical. Provide adjustable day and night controls

Corridors should not be used to supply or to exhaust/return air from rooms. Corridor air may be used to ventilate toilet rooms, HACS and small electrical or telephone closets opening directly on corridors. Exfiltration/Infiltration from Positive/negative pressure rooms adjacent to a corridor should be considered in balancing air flow.

### ***Exhaust System:***

Bronchoscopy and sputum induction areas need to be designed to comply with the latest CDC Guidelines.

Refer to Guideplate Design Standard sheet for additional information

### ***Seismic:***

Where required, install HVAC systems with seismic provisions as outlined in the VA HVAC Design Manual for Hospital Projects.

Refer to VA Handbook PG-18-3, CD-54, "Natural Disaster Resistive Design (Non-Structural)" for additional information.

### ***Noise Level:***

Select HVAC equipment, ductwork and air distribution devices to achieve noise levels listed in the HVAC Design Manual for Hospital Projects and Master Construction Specification Section 15200.

### **Plumbing:**

#### ***Water and Waste Systems:***

The plumbing systems should be provided to satisfy the departmental plumbing needs.

The department's domestic cold waters should be piped to all plumbing fixtures and equipment requiring this utility.

The department's domestic hot water should be piped to all plumbing fixtures and equipment requiring this utility. A hot water return system should be provided to ensure the design temperature at the farthest outlet.

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The department's plumbing fixtures and drains should be drained by gravity through soil, waste, and vent stacks. In addition, the department's special waste should be drained through corrosion resistance flame-retardant piping into either a local or centralized acid dilution tank.

### **Medical Gas Systems:**

The department's medical gases outlets are shown to establish the design guide basis and its use in planning. The engineers and/or designers shall verify the medical gases location and quantities for individual projects.

### **Seismic:**

Where required, the plumbing and medical gases systems should be installed with seismic provisions as outlined in the VA Plumbing Design Manual for Hospital Projects.

Refer to VA Handbook PG-18-3, CD-54, "Natural Disaster Resistive Design (Non-Structural)" for additional information.

### **Electrical:**

#### **Illumination:**

Illumination is typically provided utilizing recessed fluorescent luminaries with acrylic prismatic lenses. The fixtures typically use F32TB lamps in compliance with the National Energy Policy Act of 1992. Lamps have a minimum color rendering index (CRI) of 85 and a color temperature of 4100 degrees Kelvin (K), which is close to the "cool white" color temperature of 4150 degrees K.

Lighting intensities conform to the VA design criteria, the IES Lighting Handbook and IES publication CP-29, "Lighting for Health Care Facilities". IES CP-29 is currently being updated and will be replaced by IES Recommended Practice RP-29 in the future.

Lighting is typically controlled by wall mounted switches located at the entrance to the room. Larger spaces may utilize multiple switching through separate switches for lighting of individual zones or areas.

Power load densities for lighting are listed for use by the mechanical HVAC load calculations. Load densities should be verified for the actual design, as they may vary depending on the room configuration, fixture types, lamps and ballasts used.

#### **Power:**

General purpose duplex receptacles are typically provided on each wall of a room or space. (See electric lighting and power requirements for Sleep Disorder Rooms, Page 5-5)

Dedicated duplex or special receptacles are provided for selected pieces of equipment such as refrigerators.

Workstations with personal computers (PC's) are typically provided with quadruplex receptacles for the PC, monitor, and printer.

Junction boxes are provided for equipment requiring a hardwired connection.

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Certain modular casework units are provided with a utility access module with surface mounted electrical strip mold which also provides a chase for wiring. Conduits and junction boxes are provided to connect to the utility access module for power wiring.

Duplex receptacles on the critical branch of the emergency power system are provided for selected pieces of equipment such as refrigerators to allow for limited operation during a power outage.

Electrical isolation is needed for patient contact equipment in sleep study areas.

### **Security:**

(Not Used)

### **Life Safety:**

#### **Purpose:**

The life safety program should be developed to provide a reliable system to protect the building occupants, fire-fighting personnel, building contents, building structure, and continuity of building function. Its intent should be to provide a reasonable level of fire safety by reducing the probability of injury, loss of life, or building function changes due to a fire. This can be accomplished by limiting the development and spread of a fire emergency to the area of origin and reducing the need for total occupant evacuation.

The design aspects of the facility which relate to the fire and life safety include:

- ⇒ Structural fire resistance
- ⇒ Building compartmentalization
- ⇒ Fire detection, alarm and suppression
- ⇒ Smoke control and exhaust
- ⇒ Firefighter access and facilities
- ⇒ Emergency power

New hospital construction and renovated areas of existing facilities are required to be fully protected by an automatic fire suppression system.

The minimum width of corridors and passageways in Pulmonary Medicine areas is 1100 mm (3'-8") in areas to be used only by staff. The minimum width of corridors in areas that will also be used by inpatients is 2400 mm (8'-0").

### **References:**

Refer to the latest editions of NFPA 101 "Life Safety Code", the Uniform Building Code and additional standards published by the National Fire Protection Association (NFPA).

### **Energy Conservation:**

Refer to VA HVAC Design Manual for Hospital Projects for information.

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### Communications:

#### **Telephone:**

Telephone outlets are typically provided at each workstation or in each room. Desk outlets are 450 mm (18") AFF and wall phone outlets are 1200 mm (48") AFF.

Certain modular casework units are provided with a utility access module that houses communication outlets and provides a chase for cabling. Conduits and junction boxes are provided to connect to the utility access module for telephone service.

#### **Automatic Data Processing (ADP):**

ADP (computer) outlets are typically provided at each workstation with a personal computer (PC) and/or printer. Desk outlets are 450 mm (18") AFF.

Certain modular casework units are provided with a utility access module that houses communication outlets and provides a chase for cabling. Conduits and junction boxes are provided to connect to the utility access module for ADP service.

Survey of the site may indicate that consideration should be given to include data lines for modem output to interface with the file servers that may belong to local universities, libraries, or that access the InterNet.

#### **Public Address:**

Pulmonary Medicine will not have an independent public address (PA) system. The department will be included as part of the hospital-wide PA system. Speakers are typically located in corridors and public spaces. The actual system configuration will depend on the overall design layout and on the functional requirements.

As previously noted in sleep study areas, intercoms should be able to switch to "off" in sleep rooms and to adjust the volume in diagnostic rooms, so as not to disturb patients during studies.

### Waste Management:

#### **Medical Waste:**

Medical waste is generated in exam and treatment spaces and in soiled equipment work areas. It is then bagged, collected, and transported to the soiled utility rooms where it is held in separate containers pending transport to the medical waste handling facility.

#### **General Waste:**

General Waste is generated in all spaces and is held in containers for collection and sorting into carts, or it is bagged and placed in a waste chute and is then transported to the waste handling facility.

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### **Recycling:**

Methods for sorting, collecting, transporting, and disposing of recyclable products must be specifically analyzed for each facility and location.

The optional use of disposable and reusable products is an important consideration in recycling and waste disposal alternatives.

### **Soiled Linen:**

Soiled reusable linens are generated in exam rooms, treatment spaces, and patient and staff gowning areas. They are collected in carts or hampers (depending on volume) in the soiled utility rooms or they are bagged and transported to (a) central collection area(s) via soiled linen chutes or carts.

Disposable linens are included with general recyclable waste or medical waste as appropriate.

### **Utensils and Reprocessed Items:**

Reusable utensils include bed pans, urinals, emesis basins, and other stainless steel items which are used in exam and treatment areas. They are transported to the soiled utility room where they are reprocessed if steam washers are available or they are collected for transport to the Sterile Processing Department for reprocessing.

Additional items for reprocessing are generated in the equipment cleaning and repair areas.

### **Space Requirements:**

Space requirements will vary with the selection of waste collection/recycling methods and systems and the space requirements. This needs to be analyzed for each optional method or system considered for new and existing facilities.

While space needs are determined by VA Handbook 7610 on a departmental basis, space provisions for waste collection needs to be distributed and dedicated to a variety of uses to accommodate the system and method selected.

## **Transportation:**

### **Patient:**

#### **Outpatient:**

Provide convenient access from patient parking and primary care entrance.

Provide passenger elevator access to Pulmonary Medicine facilities located off of the main entrance levels.

Use techniques, including clear access routes, public spaces, landmarks, and signage, to facilitate wayfinding.

#### **Inpatient:**

Inpatients arrive at a common control point with outpatients.

Provide access for stretcher and wheelchair patients from inpatient areas.

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Separate inpatient and outpatient traffic where possible.

Inpatient access from hospital service elevators is required

Inpatients access patient holding through a dedicated route separate from outpatient waiting.

### **Staff:**

Staff access should be separated from patient waiting and holding areas.

Staff lounge and locker areas should be located away from inpatient and outpatient traffic.

### **Specimens:**

Specimens are collected locally or are hand-transported to the blood gas lab and/or to laboratory services as required.

### **Pharmaceuticals:**

Pharmaceuticals, including narcotics, are transported by pharmacy personnel to the department in locked carts

Narcotics are delivered to a narcotics safe which is usually located in a clean supply or patient prep area and is remotely alarmed to the nearest nursing station

### **Materials:**

Clean supplies are transported by exchange carts, which are stored in the Clean Supply Room.

Supplies are transported by service elevators through hospital corridors that are separated from patient traffic where possible.

Deliveries are scheduled during hours when patient visits are not scheduled.

### **Sterile Supplies:**

Sterile items are transported to equipment processing on dedicated closed carts.

Equipment is also transported to the sterile Processing Department as appropriate for steam cleaning and sanitizing.

The use of sterile supplies for other procedures is accommodated by prepackaged or disposable items delivered with clean supplies.

### **Linen:**

Disposable linens are delivered as part of clean supplies.

### **Food:**

Meal and Nourishment deliveries to Pulmonary Medicine are not required.

### **Waste:**

Medical waste has been previously discussed on Page 2 - 12 of this guide.