DoD Space Planning Criteria for Health Facilities
Nursing Units

4.1.1 PURPOSE AND SCOPE

This document provides space planning criteria for hospital-based inpatient nursing units. These criteria will generally be used to plan traditional acute care medical/surgical units, intensive care/cardiac care units (ICU/CCU), and intermediate care units, as well as acuity-adaptable units. These criteria may also be used for planning a dedicated pediatrics unit, a substance abuse/alcohol rehabilitation unit, and other specialty units (e.g., cardiology, orthopedics, neurosciences) as required by the user. When planning a specialty unit, the major concern is the equipment within the room i.e. cribs versus full size beds for Pediatrics, etc. However, these criteria should not be used for the following functional areas that are included in other space planning criteria sections:

- Antepartum and postpartum units (Section 4.2 — Labor and Delivery/Obstetric Unit).
- Nurseries (Section 4.3 — Nursery).
- Post-anesthesia recovery units and medical same-day stay units (Section 4.4 — Surgery).
- Inpatient pharmacy (Section 5.5 — Pharmacy).

4.1.2 DEFINITIONS

Acuity-Adaptable (Medical/Surgical) Nursing Unit: A medical/surgical nursing unit where all the beds are located in acuity-adaptable patient rooms.

Acuity-Adaptable Patient Room: An acuity-adaptable patient room is a larger, single-occupancy room that can be utilized for most any level of care including intensive care, intermediate care, and acute care by altering its monitoring equipment, furnishings, and staffing levels. Also referred to as "universal" patient rooms, these patient rooms can also be adapted to changing demand and patient populations over time with minimal or no renovation.

Acute Care: Short-term medical treatment, usually in a hospital, for patients having an acute illness or injury or recovering from surgery.

Automated Medication Dispensing Unit: A drug storage device or cabinet that electronically dispenses medications in a controlled fashion and tracks medication use.

Average Daily Patient Load (ADPL): The average daily beds occupied as determined by the midnight census.

Average Length of Stay (ALOS): The length of stay for an individual patient is the total amount of time that he/she stays in a healthcare facility between arrival (admission) and departure (discharge) and is determined based on the midnight census. The average length of stay for a specific patient population or facility is the total of all patient days (lengths of stay) divided by the number of patient admissions/discharges.

Cardiac Care Unit (CCU): An intensive care unit that provides care to patients with a variety of cardiovascular illnesses and related medical issues. The nursing staff receives specialized training in the care of patients with cardiac arrhythmias, chest pain, heart failure, and other critical medical conditions.

Diagnostic Related Groups (DRGs): A classification system that groups patients according to diagnosis, type of treatment, age, and other relevant criteria. Under the prospective payment system, hospitals are paid a set fee for treating patients in a single DRG category, regardless of the actual cost of care for the individual (Source: Centers for Medicare and Medicaid Services). This term is not used in any criteria statement but is used in the Policy Section.

e-ICU: The term e-ICU refers to the remote patient management of critically-ill patients in response to shortages in nursing staff and intensivists and pressures to improve patient outcomes. Remote or "virtual" ICU monitoring centers can monitor multiple ICUs at once from a distant location with real-time "telepresence" including review of clinical documentation and medical images, monitoring of vital signs, and use of digital stethoscopes and high-quality video cameras. This term is not used in any criteria statement but is used in the Policy Section. The

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Planning Range/Comment asked 'Will a remote patient monitoring system be used in (fill in the blank – Med/Surg, ICU/CCU, or Substance Abuse/Alcohol Rehabilitation Unit.

Full-Time Equivalent (FTE): A work force equivalent to one individual working full time for a specific period which may be made up of several part-time individuals or one full-time individual. For space planning purposes, the actual "head count" on the peak (most active) daily work shift is used and includes military, civilian, and contractor personnel.

High-Acuity Patients: Patients with life threatening, critical illnesses, injuries, or complications who require intense observation/monitoring, care, and treatment.

Hospitalist: A hospitalist is a physician, usually trained in internal medicine, who is predominantly engaged in the care of hospitalized inpatients in acute care nursing units and intensive care units. The hospitalist acts as a consultant to the patient's primary care physician, keeping him/her informed of the patient's progress, and returns the patient to the care of his/her primary care physician upon discharge from the hospital. This term is not used in any criteria statement.

Infection Control Risk Assessment (ICRA): An assessment of the needs of the specific patient population served by the healthcare facility being planned to determine the potential risk of transmission of various agents in the facility.

Intensive Care Unit (ICU): A nursing unit that is specially staffed and equipped for the observation/monitoring, care, and treatment of high-acuity patients with life threatening illnesses, injuries, or complications from which recovery is possible. It provides special expertise and facilities for the support of vital function and utilizes the skill of nurses and other staff experienced in the management of these problems.

Intensivist: A physician whose medical practice is focused entirely on the care of the critically ill or injured. This term is not used in any criteria statement.

Isolation Patient Room (Airborne Infection): A patient room that is designed with negative pressure/air flow to provide airborne isolation (e.g., patient with tuberculosis) according to the standards established by the Centers For Disease Control and Prevention.

Isolation Patient Room (Protective Environment): A patient room that is designed with positive pressure with all supply air passing through HEPA filters to provide a protective environment for the patient (e.g., patient with a compromised immune system).

Major Diagnostic Categories (MDCs): A major diagnostic category is one of twenty five mutually exclusive principal diagnosis categories which correspond to a single organ system or etiology and in general are associated with a particular medical specialty. MDC's are part of the larger DRG system and each individual DRG corresponds to one distinct MDC. This term is not used in any criteria statement but is used in the Policy Section.

Medical/Surgical Nursing Unit: A nursing unit that provides general and acute care for patients with medical problems or for those recovering from surgery.

Medication Preparation Room: A room used to stage, store, and prepare medications delivered to the nursing unit by the pharmacy according to the needs of the patients being cared for on the unit; a sink, cabinetry and/or mobile carts, and locked storage for controlled substances is required.

Multipurpose Activity Area: An optional activity area on the nursing unit, generally used by patients with an extended length of stay, that can be used for physical therapy, a playroom (e.g., for pediatrics patients), teaching/education (e.g., substance abuse/alcohol treatment), and various other activities.

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Nourishment Center: An area that is generally used for the staging (or reheating/rethermalization) of patient meal trays that are typically delivered to the nursing unit on mobile carts. The storage and preparation of unscheduled patient nourishments also occurs in this space.

Nurse Station: The traditional central communication, monitoring, and charting/dictation area within a nursing unit.

Nurse Sub-Station: Decentralized nurse sub-stations that are located nearer to small clusters or groups of patient rooms. In this case, the central nurse station functions primarily as a central communication hub.

Nursing Pod or Module: A small sub-group or cluster of patient rooms within a larger nursing unit that may share a nurse sub-station (for decentralized charting); decentralized supply inventories may also be provided. Nursing pods are generally designed to reduce the amount of time that nurses spend traveling between the patient bedside and the central nurse station and centralized support services, thus allowing the nurse to spend more time with his/her patients

Nursing Unit: A group of inpatient beds with a central nurse/communication station and all the functions necessary to provide care to the patients on the unit. A common patient room module may be designed to house one patient (single room) or two patients (double room). Patient acuity and length of stay are the primary factors that impact the number and size of patient rooms, type and amount of support space, and overall unit layout/configuration. Higher acuity patients and/or extended stay patients require additional space. Larger patient rooms are required for sicker patients who may require resuscitation/intervention or treatments that involve additional equipment and staff. These higher-acuity patients are generally grouped into smaller nursing units to facilitate more intense observation and monitoring. Substance abuse/alcohol rehabilitation patients do not require large patient rooms, but, because of their extended length of stay, may require additional space for group dining and recreation, therapy, and family visitation. The size of a specific nursing unit is also influenced by the mix of single versus double patient rooms, planned operational/support systems, and the level of amenities to be provided. A nursing unit consists of the following general types of space:

- **Patient care space** primarily includes the patient bedrooms and contiguous toilet/shower rooms. Other patient care spaces may also be provided such as a minor treatment room and group dining and activity areas for more ambulatory patients with longer lengths of stay.
- **Administrative/staff support space** includes the central nurse station (communication, monitoring, and charting/dictation area), optional nurse sub-stations, and related provider administrative/work areas. Other staff support space that may be located within the nursing unit includes a staff changing/locker room, staff lounge, staff toilet facilities, and on-call sleeping rooms.
- **Other unit support space** includes material and logistic support facilities such as rooms for medication preparation, laboratory testing, nourishment/food preparation, clean utility (supplies) and soiled utility (holding), equipment storage, and housekeeping (janitor closet). Alcoves may also be provided for stretchers/wheelchairs, linen carts, emergency/crash carts, and mobile and automated equipment.
- **Family/visitor space** may be dedicated or shared with other nursing units and includes a family waiting/day room, family conference/consultation room, playroom, toilet facilities, and other family/visitor amenities.

Occupancy Rate: The occupancy rate is the percentage of time that a bed is occupied and is calculated by dividing the average daily patient load by the actual number of beds available (staffed).

Office/Cubicle: A private office is an enclosed room outfitted with either standard furniture (OFA01) or systems furniture (OFA02). An administrative cubicle is within an open room and is constructed out of systems furniture (OFA03).

On-Call Sleeping Room: An optional sleeping room for a physician assigned to the nursing unit on an "on-call" basis, generally during the evening/night shifts.

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Patient Admissions: The number of inpatients admitted to the hospital during the time period examined. This term is not used in any criteria statement but is in the Policy Section.

Patient Days of Care: Sum of each daily inpatient census for the time period examined (usually one year). This term is not used in any criteria statement but is in the Policy Section.

Patient Discharges: The number of inpatients released from the hospital during the time period examined. This figure includes deaths and excludes births (unless the infant was admitted to the hospital's neonatal intensive care unit). This term is not used in any criteria statement but is in the Policy Section.

Pediatrics Unit: A nursing unit that provides care to infants and children typically less than 18 years of age. There are not any specific criteria provided for the creation of a pediatric unit.

Physician Charting/Dictation Carrel: A counter workstation with phone and dataport for use by physicians for phone calls, dictation, and as a docking station for handheld or laptop communication devices; should be contiguous with the central nurse station or decentralized nurse sub-stations.

Population at risk: The population to be served by the specific hospital. Population at risk is typically defined by age, gender, and other demographic factors influencing health.

Provider: An individual who examines, diagnoses, treats, prescribes medications, and manages the care of patients within the scope of their practice as established by the governing body of a healthcare organization. General providers are physicians, physician's assistants, and nurse practitioners/clinical nurse specialists who provide care to a patient.

Seclusion Room: A single occupancy room for a patient with behavioral and/or medical problems that requires close supervision. Seclusion rooms are designed to minimize the potential for self-inflicted patient injury, suicide, escape, or hiding and should be located to permit staff observation of the entrance (e.g., adjacent to the nurse station). Each seclusion room requires an anteroom and a contiguous patient toilet room with entry to the patient toilet room via the anteroom.

Shower Room: A shower room on the nursing unit designed for non-ambulatory patients who required assistance with bathing.

Specialty Unit: An acute care nursing unit or minimal care unit that aggregates a specific patient population by age (e.g., pediatrics) or diagnosis (e.g., cardiology, orthopedics, neurosciences, substance abuse/alcohol rehabilitation). There are not any specific criteria provided for the creation of orthopedics or neurosciences.

Substance Abuse/Alcohol Rehabilitation Unit: A nursing unit that provides care to patients recovering from alcohol and related substance abuse. Patient care primarily includes individual counseling and group therapy and can be provided in a hospital or a non-hospital setting.

Telemetry: Medical telemetry is the measurement of physiological parameters and other patient-related information at a distance from the patient (e.g., cardiac data, temperature, oxygen saturation, blood pressure, and respiration). Wireless medical telemetry monitors patient physiological parameters over a distance via radio-frequency (RF) communications between a transmitter worn by the patient and a central monitoring station. These devices have the advantage of allowing patient movement without tethering the patient to a bedside monitor with a hard-wired connection. This term is not used in any criteria statement.

Treatment Room: An optional room on the nursing unit (depending on the patient population and number of double patient room) that can be used for patient examinations, treatment, and minor procedures.

Use Rate: Admissions per 1,000 population at risk.

4.1.3 POLICIES

Projecting bed need. The number of beds required drives the planning of nursing units. The program data required should include the projected average daily patient load as well as a projected occupancy rate so that the actual number of beds to be programmed can be calculated. However, determination of the average daily patient load is a complex matter and involves the calculation of annual admissions and projection of an average length of stay.

Projecting annual admissions. . Annual Admissions information should be available through the facility Resource Management or Patient Administration Department. The number of annual admissions is a function of the population at risk and the admission rate. The following formula is the basis for determining annual admissions.

$$\text{Annual Admissions} = \frac{\text{Population At Risk} \times \text{Annual Admissions Per 1,000 Population At Risk (Use Rate)}}{1{,}000}$$

Estimating the number of people in the service area (population at risk) should be based on an analysis of **historical** data, recent trends, and mission changes (e.g., base reallocation and closure, modularity). Seasonal variations in demand may also need to be taken into account. When an **existing hospital** is being expanded or replaced, the historical number of admissions per 1,000 population at risk (use rate) should be analyzed along with potential changes in medical technology, physician practices, consumer demand, and other factors that may influence expected future annual patient admissions.

Calculating the average daily patient load. The average daily patient load (ADPL) is a function of the annual admissions for the population at risk and the average length of stay. The average length of stay should be estimated based on historical data, trends, and comparative benchmarks. The following formula is used to calculate the average daily patient load:

$$\text{Average Daily Patient Load} = \frac{\text{Annual Admissions} \times \text{Average Length of Stay (Days)}}{\text{365 Days Per Year}}$$

Annual admissions, use rate data, and average lengths of stay may be further collected and analyzed by diagnostic related groups (DRGs) to provide further accuracy and to determine if there will be a sufficient number of patients to warrant a specialty nursing unit (e.g., orthopedics, cardiology, neurosciences).

Along with an estimate of the average daily patient load, specific numbers of patients by specialty or level of care (e.g., ICU/CCU, substance abuse/alcohol rehabilitation, pediatrics) may also be delineated as part of the required program data. Additionally, the number of same-day/observation patients that occupy inpatient beds on an average day (and not included in standard midnight census reports) should be estimated and the projected average daily patient load adjusted accordingly.

Assigning occupancy rates to determine the number of beds to be provided. The average daily patient load identifies the "average" number of patients occupying a bed at a specific hospital site as determined by the midnight census but does not specify the actual number of beds to be planned to ensure that a bed is available on any given day. This requires the application of a planned occupancy rate. Occupancy rates are stated as a percentage (e.g., 80% or 0.80) and will vary based on:

- Random versus scheduled nature of the admission. If admission are scheduled, and not the result of a random arrival or occurrence, higher occupancy levels can be achieved. (e.g., random obstetrical delivery versus scheduled surgery procedure or substance abuse/alcohol rehabilitation admission).
- Nursing unit size. Statistically, smaller units require more beds to ensure that a bed is available when needed than larger nursing units.
- Patient room accommodations. Nursing units with a high number of multiple-bed patient rooms will require more beds to accommodate the average daily patient load than a unit with all private rooms due to inefficiencies created by patient incompatibility (e.g., gender, medical condition).

- Risk of turning a patient away if a bed is not available. The risk of not having an ICU bed available when needed would be more problematic than the lack of an alcohol rehab bed.
- Seasonal variations. If the population at risk varies significantly throughout the year (e.g., snowbirds), then use of an "annual" occupancy rate may result in an insufficient number of beds during peak periods. For example, if the total admissions for the peak month are historically 20% higher than the monthly average (annual admissions divided by 12), a lower occupancy rate may need to be used when it is applied to the average daily patient load. Alternately, policies/procedures can be established in advance to mobilize additional beds during peak periods and/or take beds out of service during low periods.
- Design flexibility. A lower occupancy rate can be used if one or more nursing units are designed with adequate flexibility to accommodate patient overflow (e.g., acuity-adaptable patient rooms, conversion to semiprivates for emergency mobilization).

Small units with high-acuity patients (e.g., ICU) should be planned with a lower occupancy rate, particularly if overflow accommodations are not available. Substance abuse/alcohol rehabilitation units, even though they may have a greater proportion of double rooms, may be planned with a higher occupancy rate since immediate admission on demand is not as critical (e.g., 90%). An occupancy rate of 80-85% is typically used for a standard medical/surgical nursing unit.

Once the average daily patient load (ADPL) has been determined, and the appropriate occupancy rate established, the following formula should be used to estimate the actual number of beds to be programmed:

$$\text{Number of Beds To Be Programmed} = \frac{\text{Average Daily Patient Load (ADPL)}}{\text{Occupancy Rate}}$$

Examples of occupancy rates include:

- 65-70% occupancy for ICUs/CCUs and other specialty units with a small number of beds (e.g., 65% for an 8-bed ICU; 70% for a small pediatrics unit with less than 18 beds).
- 80% occupancy for medical/surgical nursing units with a mix of single and double patient rooms.
- 85% occupancy for medical/surgical nursing units with all single patient rooms.
- 90% for substance abuse/alcohol rehabilitation units.

Accommodating high-acuity patients. High-acuity patients who require constant clinical observation and/or treatment for unstable or critical medical/surgical conditions have been historically aggregated in intensive care units (ICUs). The layout of a traditional ICU is characterized by large, easily accessible patient rooms that are grouped so each patient is visible from a central nurse station (provider team monitoring/communication area) with support/supply areas close at hand. Patient toilet/shower rooms are typically not provided for each patient room in an intensive care unit since these patients are not generally ambulatory due to their acuity. They would be transferred to an intermediate or general care unit at such time that they are capable of using a toilet/shower room. Due to the high-tech requirements and highly-skilled staff, intensive care units are expensive to build and operate.

More recently, the proliferation of ICUs is being challenged with cost-containment pressures, new monitoring technologies, and a lack of data supporting the effectiveness of aggregating patients in a specially-configured unit. There is concern that many ICU patients are either too ill or too well to benefit from the expensive technology and highly-skilled staff. With the use of a 1:1 or 1:2 nurse-to-patient staffing ratio and common acceptance of remote patient monitoring (e.g., e-ICU concept) the historical requirement for visualization of all patients from a single, central nurse station is being debated. The following alternatives to a traditional intensive care unit should be considered:

- High-acuity nursing pod or module as part of a larger acute care medical/surgical unit with four to six intensive care rooms/cubicles that are located proximate to the central nurse station and share support services with the nursing unit. As an option, a dedicated nurse sub-station and decentralized supply inventory could be provided

for the high-acuity pod. Since the staffing for the high-acuity pod would range from a 1:1 to 1:2 nurse-to-patient staffing ratio, the inefficiencies typically associated with a small nursing unit would not be an issue.

- Acuity-adaptable patient rooms where staffing and equipment can be readily adjusted to meet the needs of various levels of patient acuity, thereby eliminating unnecessary transfers, overstaffing, and excessive treatment based on ICU protocols. Instead, critically-ill patients, regardless of their location within the hospital, would be monitored remotely (on- or off-site) using the e-ICU concept.
- Chronic ventilator units or nursing pods to provide care for ventilator-dependent patients who may have been traditionally cared for in expensive ICUs due to the absence of alternative facilities.
- Chest pain center or observation unit, typically located in or proximate to the emergency department, to provide extended observation and evaluation of patients complaining of chest pain and to eliminate unnecessary admissions to an ICU/CCU.
- Extended recovery room hours to accommodate surgical patients who require 12 to 24 hours of intensive post-operative observation prior to being transferred to general care units or discharged.

This section uses the term "high-acuity" to refer to any patient who requires a private room, monitoring equipment, and a higher nurse-to-patient staffing ratio than provided on a traditional acute care (medical/surgical) nursing unit regardless of where observation, monitoring, or treatment of the patient occurs (e.g., traditional ICU, dedicated nursing pod, or acuity-adaptable patient rooms on a medical/surgical nursing unit with or without the e-ICU concept).

Sizing a traditional ICU. Where a traditional ICU is being planned, the number of ICU beds should ideally be based on an analysis of the unique patient population to be accommodated at the specific hospital site. A general estimate would be 5 to 10 % of the planned medical/surgical bed capacity if all medical/surgical nursing units have traditional single (or a mix of single/double) patient rooms. Where less than six ICU beds is required, an ICU pod/module should be created as part of a larger medical/surgical unit in lieu of constructing a physically separate and isolated small ICU. If more than twelve ICU beds are required, the unit should be divided into two sub-modules. Dedicated ICUs should generally be limited to eight beds and supported by an additional ICU pod or module that is part of a larger medical/surgical nursing unit if necessary. In this case, the ICU pod could also be used for specific patients (e.g., CCU integrated with other cardiology patients, ventilator-dependent patients). Another option would be to supplement a single traditional ICU with one or more acuity-adaptable medical/surgical units that can be used for overflow of high-acuity patients as needed.

Size and configuration of the medical/surgical nursing unit. New acute medical/surgical nursing units should generally be planned with no more than 36 beds per distinct unit. However, the optimal number of beds on a given nursing unit or floor is related to the modular divisibility of the total number. For example, a 32-bed nursing unit can be subdivided into pods of four, six, or eight beds or divided into two 16-bed sub-units. Alternately, 24 beds should be considered the minimum size for a distinct nursing unit with the size of the unit increased in increments of four beds (e.g., 28, 32, or 36 beds). A larger number of beds per unit (over 36 beds) may be considered if the design utilizes nursing pods (e.g., four to eight beds) with decentralized nurse sub-stations and support services and corresponding staffing patterns are developed to facilitate quality patient care.

Complement of private and semiprivate rooms. All private patient rooms should be planned when **new construction** is anticipated. For renovations **—** at a minimum **—** enough total patient "rooms" should be planned to accommodate the average daily patient load such that a second patient is placed in the double room only during high census periods. For example, a 36-bed unit with a target occupancy rate of 80% should have no more than seven double rooms (14 beds in double rooms). With 29 total rooms, each patient would have a private room until the occupancy level exceeds 80%.

Planning the nurse station and sub-stations. The most important role of the central nurse station today is as the communication hub for the unit since the central nurse station provides a workstation for the unit clerk/secretary who answers the phone, monitors nurse call status, coordinates communication between the various providers and caregivers and families, and may also perform data entry. The central nurse station also hosts a variety of professional staff, who are not exclusive to the unit such as case managers, discharge planners, social workers,

dieticians, physical therapists, pharmacists, respiratory therapists, chaplains, and other members of the interdisciplinary team. Some of the traditional functions of the central nurse station may be supplemented or replaced by decentralized nurse sub-stations that are located within small pods or clusters of patient rooms. Nurse stations and sub-stations are planned utilizing the number of beds in the particular unit.

Provision of patient support services. The systems for providing patient care support services (e.g., dietary, pharmaceuticals, supplies, patient equipment, and/or linen) must be determined prior to nursing unit space planning. Perhaps the most important decision will be whether support services will be decentralized to each nursing pod/module of approximately four to eight beds and collocated with the respective decentralized nurse sub-station. Historically, patient charts, supplies, medications, and soiled materials were stored in central locations on the nursing unit and nurses spend significant time walking between patient rooms and central support areas. Patient support services are generally provided according to predetermined timetables and specific guidelines (e.g., breakfast served at 6 a.m., supplies replenished once a day according to pre-established quotas).

Specific issues to be considered in the planning of new nursing units include:

- Dietary. It is assumed that a traditional food service system will be used where hot/cold food is delivered from a central kitchen facility directly to the patients on mobile carts according to a predetermined schedule. However, unit-based nourishment centers should allow a minimal number of trays to be refrigerated, reheated, and delivered to patients at alternative times. In some cases, the meals may be stored frozen in the unit's nourishment center and microwaved upon demand.
- Supplies. Routine supplies used on the nursing unit may be stored centrally or decentralized to support a specific pod or module of patient rooms. Patient equipment should be cleaned and dispensed from a decentralized satellite unit rather than transported to another floor level to increase responsiveness to the patient's needs and decrease the time (and labor) spent transporting supplies and equipment between floor levels. Ideally, these satellites should be connected to a central sterile processing area via a vertical cart lift or robotic system.
- Pharmacy. To enhance pharmacy responsiveness, automated medication dispensing units or satellite pharmacies on patient care floors may dispense stat (needed immediately) or first-dose medications as they are requested. Automated medication dispensing units are already commonly used for the storage/dispensing of narcotics and floor stock medications. Routine, scheduled medications may be supplied to patients from automated medication dispensing units or medication carts stored in the nurse sub-stations.

Access to electronic health information. Access to the Composite Health Care System (CHCS) should be provided in multiple locations throughout the nursing unit to reduce the time spent by the nurse to travel back and forth between the central nurse station to review and update patient information. At a minimum, data entry and access should be provided at the central nurse station, nurse sub-stations (if provided), and patient room (directly outside or at the bedside). Other options may include flip-down desks in the hall outside the patient room (or in an alcove) with flat screen monitors and/or dataports for use with portable or hand-held devices. Alternately, mobile computer carts may be provided. The security and confidentiality of patient data must be considered in the placement and configuration of computer screens/monitors to prevent unauthorized viewing, regardless of the location on the nursing unit.

Approaches to using acuity-adaptable patient rooms. To promote patient-centered care and ensure future flexibility, the provision of acuity-adaptable patient rooms should be considered when planning new hospital facilities. This approach to design and construction allows the staff of each nursing unit to determine how they will provide intensive care and step-down care. On some units, patients may remain in one room throughout their stays with staffing and equipment adjusted to meet their needs; on another unit, high-acuity patients may be aggregated in one area. In either case, the basic room module can easily be adapted. With the use of remote patient monitoring, as in the e-ICU concept, there is no need to configure an intensive care unit differently from a general medical/surgical nursing unit.

Variations in applying this concept to an entire hospital include:

- **Planning all acuity-adaptable patient rooms.** In this case, all beds would be accommodated in single, acuity-adaptable patient rooms. If the primary goal is to provide patient-centered care and to minimize patient transfers, specific pods or nursing units may be designated by specialty (diagnosis or organ system) and nursing resources would be adjusted to the patients' needs throughout their hospital stay. Applying the most rigid interpretation of this concept, patients would generally be discharged from the same room to which they are admitted. Alternately, one or more nursing pods or clusters of patient rooms could be designated for high-acuity patients (e.g., ICU) and these patients transferred to another nursing unit or pod as they recover using more traditional staffing models. However, patient transfer would generally be limited to once per stay and the designation of pods of beds for intermediate step-down care would not occur. The planning of all acuity-adaptable patient rooms should be considered for smaller healthcare facilities.
- **Hybrid model that retains a traditional ICU.** In this case a traditional ICU would be planned and staffed for the highest-acuity patients (1:1 or 1:2 nurses to patient staffing ratio) and all other medical/surgical beds would be accommodated in acuity-adaptable patient rooms. An eight to twelve-bed ICU would accommodate the sickest patients and once full, patients would be triaged to an acuity-adaptable patient room in a medical/ surgical nursing unit where they would still be monitored and receive the appropriate level of nursing care. The ICU beds would not be planned with contiguous patient toilet/shower rooms.
- **Planning a single acuity-adaptable nursing unit.** In lieu of constructing a traditional ICU, a single acuity-adaptable medical/surgical nursing would be planned (e.g., 24 to 36 beds) to accommodate high-acuity patients and all other nursing units would be designed with traditional single (and potentially some double) patient rooms. Staffing levels on the acuity-adaptable nursing unit would be adjusted to reflect individual patient needs and most patients would be transferred to a traditional medical/surgical nursing unit prior to discharge.

In some cases, the primary goal of providing acuity-adaptable patient rooms may be long-term flexibility since these patient rooms can be adapted to changing demand and patient populations over time with minimal or no renovation.

Organizing selected patients by specialty rather than acuity level: As an option for hospitals providing tertiary care, the full continuum of care (i.e., intensive, intermediate step-down, acute care) may be provided for a specific patient population on a single unit. This approach reduces the number of patient transfers, administrative steps involved with each move, improves the coordination and continuity of care, and potentially decreases medical errors. The patient remains on a single specialty-based unit with related decentralized clinical/ancillary services and is cared for by a small, multidisciplinary provider team. This concept should be considered where there is sufficient patient volume to support a dedicated specialty unit with a minimum of 24 beds.

An analysis of patient days of care by diagnostic related group (DRG), with DRGs aggregated according to the specific patients that could benefit from being aggregated on a given nursing unit, is helpful in determining the actual number of beds required by specialty (e.g., cardiology, orthopedics, neurosciences). For example, DRGs #1 to #35 represent diagnoses and the associated patient days typically accommodated on a neurosciences unit. The appropriateness of maintaining a dedicated unit (e.g., minimum number of beds) versus assigning the patients to a general medical or surgical unit can also be determined.

Pediatrics unit. Provision of a dedicated pediatrics unit (for infants and children) will be unusual although a group or pod of medical/surgical patient rooms may be designated for younger patients. In pediatrics, care is delivered in a family-centered environment, with the family unit viewed as the care recipient. Pediatric patient care areas require high visibility, a large percentage of private rooms for isolation purposes, and consideration for parent accommodations. Special requirements of a pediatric unit include a treatment room for invasive or painful procedures; parent rooming-in accommodations; parent/family toilet and shower facilities; a parent lounge; consultation space; and storage space for beds, cribs, strollers, wagons, etc. Pediatric patient rooms should be sized and configured the same as adult patient rooms in order to accommodate either cribs or standard beds at any given time.

Substance abuse/alcohol rehabilitation unit. This section may also be used to plan a dedicated substance abuse/ alcohol rehabilitation unit that provides care to patients recovering from alcohol and related substance abuse. In addition to traditional patient bedrooms, at least one seclusion room should be provided in which a patient can have therapeutic time alone without the possibility of hurting him/herself and needing restraints. Once the number and

type of patients have been determined, the appropriate individual and group therapy spaces and recreation areas can be identified. The extent of daily activity and recreation spaces will depend primarily on the specific program and length of stay (e.g., 10 days, 30 days). A greater proportion of double patient rooms are generally desired for substance abuse/alcohol rehabilitation units to create the appropriate therapeutic environment. Substance abuse/alcohol rehabilitation should only be provided within an acute care hospital if no other non-hospital setting is available.

Isolation facilities. Isolations rooms are used for patients requiring airborne infection (respiratory) isolation and protective environment isolation. Patients in respiratory isolation, usually for tuberculosis or chicken pox, require isolation rooms with negative air flow/pressure. Patients in protective isolation, typically patients with compromised immune systems due to chemotherapy or organ transplants, require isolation rooms with positive air flow/pressure. The number and type of isolation rooms should ideally be based on an Infection Control Risk Assessment (ICRA). At a minimum, one isolation room for airborne infection (negative pressure) should be provided on each nursing unit (including dedicated ICUs) unless more are indicated based on an ICRA. If the ICRA warrants, a separate anteroom, in addition to the patient toilet/shower room, should also be planned for each negative pressure/airborne isolation room; all positive pressure/protective isolation rooms shall be planned with an anteroom.

Provision of patient toilet/shower rooms. All patient rooms should have a dedicated and contiguous patient toilet/shower room with the exception of traditional intensive care patient rooms. If a dedicated ICU is planned, contiguous patient toilet/shower rooms should be omitted and a procedure established for the disposal of patient wastes in the soiled utility room. The addition of grab bars in the patient toilet/shower rooms will allow all rooms to be wheelchair accessible.

Emergency mobilization considerations. It is assumed that all single medical/surgical patient rooms (excluding specifically designed ICU rooms) will have the capacity to expand to two beds under emergency conditions.

Patient room size, configuration, and amenities. All of the key planning issues, described above, will ultimately impact the size, configuration, and amenities to be provided in the patient room module on any given nursing unit. The size of the standard patient room module will have the most significant impact on the overall nursing unit space allocation and corresponding renovation or construction costs. The patient room and adjacent area should be designed to accommodate four functional zones of activity:

- Patient zone includes life support systems (e.g., headwall, power column, ceiling-mounted), patient bed, and over-bed table. The patient shall have access to individual controls for lighting, communication, entertainment (TV/VCR/DVD), and privacy as required, as well as a window view to the outside. Beds may be equipped with advanced computer technology that will allow the staff to record the patient's weight and other vital data without disturbing the patient. A wardrobe for the patient's personal belongings shall be provided as well as a display shelf and bulletin board at viewing distance from the patient bed.
- Care provider zone includes a data access/input station (charting) for the care provider and convenient access to all the equipment and supplies required for the care of the patient. Data access/input (charting) and decentralized supply and equipment storage may be accommodated at a nurse sub-station serving a small pod/group of patient rooms. Alternately, a flip-down desk with a flat screen monitor and/or dataport, for use with a portable or hand-held device, may be located in the patient room, in an adjacent alcove within or immediately outside the patient room, or a mobile computer cart may be provided.
- Family/visitor zone should include a recliner/sleeper chair, a side chair, and a side table with a dataport for family members and visitors. A window bench that can be converted to a bed should be considered as space allows.
- Hygiene zone includes the patient toilet/shower room with handwashing lavatories provided in both the toilet/shower room as well as within the patient room or entry alcove to accommodate staff handwashing. Handwashing facilities must be conveniently located for use by care providers upon entering/exiting each patient room. Since toilet/shower rooms are not typically provided for ICU patients, a policy for the removal of human waste must be developed.

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Within the patient room, the furnishings, medical equipment, technology, supply storage, and overall layout/configuration should be standardized to the extent possible. Although often cost prohibitive, consideration should be given to the design of a patient room module with each room oriented identically (rather than mirror image pairs of patient rooms with shared utility columns) which has been shown to enhance staff efficiency and reduce medical errors.

Provision of administrative offices and workstations. Private and non-private administrative offices and workstations will be provided as follows:

- Offices, private. With the exception of the offices provided for "Key Personnel," all other private offices will be 100 net square feet as stated in Section 2.1 (General Administration). Private offices will be provided for the following personnel:
  - Staff who must meet with patients/customers on a regular basis and hold private consultations/discussions.
  - The senior officer and enlisted member of a department.
  - Staff who supervise others and must hold frequent, private counseling sessions with their junior staff. This does not include staff who supervise a very small number of people and who would only occasionally need private counseling space. These staff can use available conference rooms or other private areas for their infrequent counseling needs.
  - Any personnel who interview or counsel patients with patient privacy concerns.

- Offices, non-private or shared space. Personnel, who require office space, but not a private office, will be provided space in a shared office. Non-private or shared office space will be programmed at 60 net square feet per occupant.

4.1.4 PROGRAM DATA REQUIRED

The following program data is required to plan an individual inpatient nursing unit (addressed in this section):

Is a Medical/Surgical Unit projected?
- Will patient bedrooms in the Medical/Surgical Unit be single occupancy?
- Will patient bedrooms in the Medical/Surgical Unit be double occupancy?
- How many projected Annual Admission for the Medical/Surgical Unit?
- What is the projected Average Length of Stay (Days) for the Medical/Surgical Unit?
- Based on an Infection Control Risk Assessment (ICRA), how many isolation rooms (positive and negative pressure) are required?
- Will patient bedrooms be single patient, acuity adaptable?

Is an Intensive/Coronary Care Unit projected?
- How many projected Annual Admission for the Intensive/Coronary Care Unit?
- What is the projected Average Length of Stay (Days) for the Intensive/Coronary Care Unit?
- Based on an Infection Control Risk Assessment (ICRA), how many isolation rooms (positive and negative pressure) are required in the Intensive/Coronary Care Unit?

Is a Substance Abuse/Alcohol Rehabilitation Unit projected?
- Will patient bedrooms in the Substance Abuse/Alcohol Rehabilitation Unit be single occupancy?
- Will patient bedrooms in the Substance Abuse/Alcohol Rehabilitation Unit be double occupancy?
- How many projected Annual Admission for the Substance Abuse/Alcohol Rehabilitation Unit?
- What is the projected Average Length of Stay (Days) for the Substance Abuse/Alcohol Rehabilitation Unit?

Will the Nursing Units be separated into pods/modules (4 bed or 8 bed)?
Will the e-ICU concept be deployed using a remote monitoring station?
How many FTE Nurse Supervisors are projected?
How many FTE NCOIC/LCPO/LPOs are projected?
How many FTE staff will require a private office? **Note:** Do not include Nurse Supervisors or NCOIC/LCPO/LPOs.
How many FTE staff will required dedicated cubicle?
How many FTEs on peak shift are projected?
Will vending machines in the Staff Lounge?
Will patient food trays be rethermalized on the Nursing Unit?
Is a satellite laboratory projected for the Nursing Unit?
Will a playroom be provided (adjacent to the Family Waiting/Day Room)?

4.1.5 SPACE CRITERIA

FUNCTION	Room Code	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
PATIENT AREA (MEDICAL/SURGICAL)				
Bedroom, Medical/Surgical, 1 Bed	BRMS1	28.80	310	Per formula on page 6 and concept of operations.

FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
		m^2	nsf	
PATIENT AREA (MEDICAL/SURGICAL) Continued				
Bedroom, Medical/Surgical, 2 Beds	BRMS2	33.44	360	Per formula on page 6 and concept of operations; accommodates two patients/beds
Bedroom, Isolation, Negative Pressure	BRIT1	28.80	310	One per unit unless greater number required based on ICRA; includes anteroom (BRAR1)
Bedroom, Isolation, Positive Pressure	BRIT2	28.80	310	One per unit unless greater number required based on ICRA; includes anteroom (BRAR2); if required by ICRA.
Bedroom, Universal, Inpatient (Single Patient, Acuity Adjustable)	BRUN1	29.73	320	Per formula on page 6 and concept of operations; accommodates varying patient acuity by altering the equipment and staffing levels.
Bedroom, Intensive/Coronary, 1 Bed	BRIC1	29.73	320	Per formula on page 6 and concept of operations; does not require dedicated patient toilet/shower room.
Bedroom, Isolation, ICU/CCU, Negative Pressure	BRII1	29.73	320	One per unit unless greater number required based on ICRA; includes anteroom (BRAR1); requires a dedicated patient toilet/shower room.

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FUNCTION	Room Code	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
PATIENT AREA (MEDICAL/SURGICAL) Continued				
Bedroom, Isolation, ICU/CCU, Positive Pressure	BRII2	29.73	320	One per unit unless greater number required based on ICRA; includes anteroom (BRAR2); requires a dedicated patient toilet/shower room.
Patient Toilet/Shower Room (Dedicated)	TLTS2	6.04	65	One per patient room (excluding non-isolation ICU/CCU patient rooms).
Shower Room	SHWR2	7.43	80	One per unit; for non-ambulatory patients.
Treatment Room	TRGM1	16.26	175	One per unit unless all private rooms are provided; used for minor procedures.
SUBSTANCE ABUSE/ALCOHOL REHABILITATION AREA				
Bedroom, Substance Abuse/Alcohol Rehab, 1 Bed	BRNP1	16.72	180	Per formula on page 6 and concept of operations.
Bedroom, Substance Abuse/Alcohol Rehab, 2 Beds	BRNP2	25.08	270	Per formula on page 6 and concept of operations.
Patient Toilet/Shower (Dedicated)	TLTP3	5.57	60	One per Substance Abuse/Alcohol Rrehabilitation patient bedroom.
Bedroom, Seclusion Room	BRNP5	11.15	120	One per Substance Abuse/Alcohol Rehabilitation Unit.
Patient Toilet, Seclusion	TLTP1	3.25	35	One per Seclusion Room.

Anteroom, Seclusion	BRNP6	6.50	70	One per Seclusion Room.

FUNCTION	Room Code	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS

SUBSTANCE ABUSE/ALCOHOL REHABILITATION AREA
Continued

Multipurpose Activity Area	DAYR1	22.30	240	Minimum 240 nsf; Maximum 450 nsf. Allow 40 nsf per Substance Abuse/Alcohol Rehabilitation bed over 10. Area used for recreation, counseling/therapy and teaching/education.
Group Therapy/Quiet Room	OPMH1	18.58	200	Minimum 200 nsf; Maximum 400 nsf. Allow 20 nsf per Substance Abuse/Alcohol Rehabilitation bed over 10. maximum 400 nsf.
Patient Dining Area	IPKO1	13.01	140	Minimum 140 nsf; Maximum 300 nsf. Allow 5 nsf per Substance Abuse/Alcohol Rehabilitation bed over 10. Area should be co-located with the Multipurpose Activity Area (includes kitchnette).
Patient Laundry Area	NULR1	7.43	80	Area for the use of Substance Abuse/Alcohol Rehabilitation patients; provides space for automatic washer and dryer.
Consultation Room	OFDC2	11.15	120	One per increment of 12 Substance Abuse/Alcohol Rehabilitation beds.

FUNCTION	Room Code	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
SUBSTANCE ABUSE/ALCOHOL REHABILITATION AREA Continued				
Exam Room	EXRG1 EXRG2 EXRG3	11.15	120	One per Substance Abuse/Alcohol Rehabilitation Unit.
Patient Toilet, Unisex	TLTP1	4.65	50	One adjacent to Multipurpose Activity/Patient Dining Area.
STAFF AND ADMINISTRATIVE AREAS				
Nurse Station, Inpatient	NSTA1	7.43	80	Minimum 80 nsf; Maximum 240 nsf. 10 nsf per bed.
Nurse Sub-Station	NSTA3	5.57	60	Depending on concept of operations; 60 nsf per four to eight-bed pod/module.
Remote Monitoring Station	WRCH1	11.15	120	When remote, centralized monitoring of high-acuity patients is planned, a minimum of 120 nsf provides space for two workstations. For each increment of 8 beds, provide 60 nsf for additional workstations.
Nurses Work Room	WRCH1	11.15	120	Minimum 120 nsf; 5 nsf per bed. Total square footage can be subdivided into small Nurse Work Rooms.

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FUNCTION	Room Code	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
STAFF AND ADMINISTRATIVE AREAS Continued				
Physician Charting/Dictation Carrel	WRCH1	3.72	40	Minimum 40 nsf; provides space for 4 carrells. Add 10 nsf per per increment of 6 beds over the first 6 beds.
Office, Nurse Supervisor	OFA01 OFA02	11.15	120	Per authorized FTE.
Office, NCOIC/LCPO/LPO	OFA01 OFA02	11.15	120	Per authorized FTE.
Private Office	OFA01 OFA02	11.15	120	Per authorized FTE requiring private office.
Administrative Cubicle	OFA03	5.57	60	Per authorized FTE requiring cubicle.
Staff Toilet, Unisex	TLTU1	4.65	50	Minimum of one for the first 15 FTEs on peak shift. Add one TLTU1 for every additional 15 FTEs on peak shift. Can be combined into multi-stall toilets.
Staff Lounge (GP)	SL001	13.01	140	Minimum 140 nsf for 10 FTEs on peak shift. Add 5 nsf for each peak shift FTE over 10. Maximum size is 300 nsf without vending machines and 320 nsf if vending machines are included.

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FUNCTION	Room Code	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
STAFF AND ADMINISTRATIVE AREAS Continued				
Personal Property Locker Area	LR001	1.86	20	Minimum for the first 10 FTEs on peak shift. Add 2.5 nsf for FTE over 10. For staff without a dedicated office/cubicle space.
Locker room	LR002	9.29	100	Per Nursing Unit, can be shared with multiple units or in a central location within the Nursing Unit.
	TLTU1	4.65	50	
	SHWR1	5.57	60	
On-Call Sleeping Room (GP)	DUTY1	11.15	120	Per Nursing Unit, can be shared with multiple nursing units or in a central location within the hospital.
Toilet/Shower, On-Call	TLTS1	5.57	60	One per On-Call Sleeping Room.
UNIT SUPPORT AREAS				
Clean Supply Room	UCCL1	11.15	120	Minimum 120 nsf; 10 nsf per bed.
Soiled Utility Room	USCL1	11.15	120	Minimum 120 nsf; 7 nsf per bed.
Clean Supply Room, Satellite	UCCL1	7.43	80	Per concept of operations; minimum 120 nsf; 10 nsf per bed
Soiled Utility Room, Satellite	USCL1	5.57	60	Per concept of operations; minimum 120 nsf; 7 nsf per bed.
Clean Linen Cart Alcove	LCCL1	5.57	60	One 60 nsf alcove (accommodates 3 carts) for every eight beds.

DoD Space Planning Criteria for Health Facilities
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FUNCTION	Room Code	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
UNIT SUPPORT AREAS Continued				
Trash and Linen Collection	UTLC1	9.29	100	One per Nursing Unit.
Medication Preparation Station	MEDP1	9.29	100	One per Nursing Unit.
Nourishment Center (GP)	NCWD1	9.29	100	One per unit; provide additional 5 nsf per bed if trays are rethermalized on the unit.
Equipment Storage Room	SRSE1	11.15	120	One per Nursing Unit.
Automated Medication Dispensing Unit	MEDP1	1.86	20	One per Nursing Unit.
Crash Cart Alcove	RCA01	1.86	20	Minimum one per Nursing Unit; add second alcove if Nursing Unit exceeds 24 beds. One per every four ICU/CCU beds.
Mobile X-ray Alcove	XRM01	3.72	40	One per Nursing Unit.
Litter and Wheelchair Storage	SRLW1	5.57	60	Minimum one alcove per Nursing Unit; add second alcove if Nursing Unit exceeds 24 beds
Laboratory, Satellite	LBSP1	7.43	80	Per concept of operations; one per Nursing Unit.
Medical Gas Storage Room	SRGC2	3.72	40	One per Nursing Unit.
ICU/CCU Patient Monitoring System Room	CMP01	9.29	100	One per ICU/CCU.

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FUNCTION	Room Code	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
FAMILY/VISITOR AREA (MAY BE SHARED WITH MULTIPLE UNITS)				
Family Waiting/Day Room	WRF01	22.30	240	Minimum 240 nsf; Maximum 300 nsf. 20 nsf per each two-bed patient room and 10 nsf per each private patient room. Includes two carrels with data ports; space may be combined to serve multiple units.
Public Toilets	NA	NA	NA	Per Section 6.1 (Common Areas).
Consultation Room (GP)	OFDC2	11.15	120	One per Family Waiting/Day Room.
Playroom	PLAY1	11.15	120	Depending on concept of operations; adjacent to Family Waiting/Day Room.
Playroom Storage	SRS01	3.72	40	One per Playroom.