Space Planning for the Bariatric Patient

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by Marylou Muir, RN, COHN

Space Planning For the Provision of Bariatric Patient Care in Critical Care and Acute Care Settings

The increased need to provide safe and quality care for the bariatric patient and healthcare workers has emerged as a significant issue for the healthcare institutions of today. The increasing need for facilities to modify or build appropriate rooms to meet the demand of the obesity epidemic has many professionals seeking out information that can assist in planning. The ability to provide for quality care for bariatric residents requires that planners and administrators acquire the knowledge to understand the relationship between space, equipment, patient care, patient size, and furnishings. Consideration must be given to specific details in order to safely and properly plan a room space. This article assists the reader in identifying space needs for critical care settings and acute care settings by discussing the details of the care needs in each setting as it relates to healthcare worker and patient space requirements. Based on current safe patient handling practices and equipment technology, these recommendations for space are meant to be used as a guideline for all of those that are addressing the need; this includes designers, architects, and nursing personnel. It will additionally assist healthcare providers in assessing their bariatric space needs.

Key words: bariatric, space, acute care, critical care, equipment

Background

The World Health Organization (WHO) has identified that the obesity epidemic is increasing at alarming rates across all developed nations. Seen as one of the most significant worldwide health problems, it is estimated that over one billion adults worldwide are overweight and 300 million are obese.[1,2] This increase is occurring in both sexes, across age groups, races, and educational levels.[2] In the US, the incidence of obesity is estimated to be 38 million, of which 9 million are categorized as severely obese, and costs the US healthcare system $75 billion per year.[3] Managing these patients when they enter the healthcare system can be an extreme challenge for the healthcare workers (HCW) and facilities. Patient size, level of dependence as it relates to care required, equipment technology and availability, and well as environmental space are all factors that need proper management.

The healthcare facilities and environments in which the bariatric patient will require care outside of their home include acute care (medical or surgical units), emergency care (emergency rooms or critical care units), long-term care (palliative or nursing home units), and community sites, such as treatment centers or doctors’ offices. All of these sites need to ensure that current and future development plans are addressing the needs and making the appropriate provisions to provide a safe and efficient care environment for the patients and healthcare workers.

Traditionally, existing architectural, furnishings, and equipment elements were designed to accommodate patients up to 350 pounds. For patients over that size, as well as the staff who care
for them, the existing traditionally-sized rooms are inadequate to provide safe care. The following cascade of events occurs when patients/residents have adequate space to be properly cared for and are properly mobilized:[4]

- Increase in heart/lung capacity and blood circulation
- Reduced risk of pneumonia, thrombosis, and other illnesses
- Improved mobility and quality of life.

For the facilities and the workers, the adequate space will affect the ability to properly mobilize the patient and will assist to meet the following outcomes:[4]

- Patients/residents have a reduced need for assistance
- Reduced strain-related injuries and increased staff productivity
- Reduced turnover of staff
- Reduced cost and enhanced quality of nursing

Types of Care and Space Needs
In order to determine the type of space required, the common functions and tasks that are to occur in the room need to be identified. Generic patient care tasks would include the following:

- Providing care to the patient within the bed, such as repositioning, turning, skin and wound care, feeding, and bathing
- Providing care beside the bed, transfer to chair/stretchers/commodes, and assistance while sitting in the chair/wheelchair
- Assisting the patient to mobilize in the room or to another area (i.e., bathroom)
- Providing assistance in other parts of the room, assisting the patient off the floor, and assisting the patient to rise from a seated device.

The HCW space necessary requires the ability to bend and move. Additionally, HCW needs space on both sides of the bed and, in critical care, at the head of the bed as well. The space at the foot of the bed needs to be adequate for the passage of equipment, HCWs, and the patient. Space guidelines for HCWs listed in Table 1 on space for safe patient handling tasks are adapted from the following texts: Arjo Guidebook for Architects and Planners[5] and the Safe Patient Handling and Movement: A Practical Guide for Health Professionals.[6]

The equipment space must provide for the ability to move the patient, bed, stretchers, lift devices, mobility devices, and seated devices in an ergonomic pathway that limits turns and twisting of equipment while under load to prevent exceeding safe work limits for spinal loading for the healthcare providers. When designing space, accommodation for the task that requires the most space is what should be kept in mind.

In order to determine this inventory of equipment and its width, length and how it will interface in the room is required (Table 2) for standard equipment lengths and widths. Please note that as technology changes, the sizes and widths of equipment may change and thus the sizes can become quickly outdated. A turning radius of 72 inches of clear floor space is recommended.
between furnishings, walls, and equipment in order to facilitate equipment maneuvers.

**Space Design for Critical Care Areas**

Critical care will include urgent care and areas known to provide life support, including intensive care units, surgical intensive care, or emergency rooms. The patient is often totally dependent for care and can be critical or comatose.

Critical care space requirements are typically limited to activities that occur within the bed; these bariatric patients are usually not ambulatory while in this setting, with or without assistive devices. Space available around the bed must allow for nursing care activities with up to six caregivers and equipment such as monitors and ventilators, and be sufficient to complete a transfer onto a bariatric-sized stretcher or chair. The room space requires that the workers can access the patient from four sides of the bed, including the head.

In this setting, equipment is often brought in only during use and it is removed from the space when not in use. An example of this is a patient chair. Patients may sit up in a chair occasionally, although it is usually only for short periods of time. Additionally, the space required for these tasks depends on the patient’s ability to assist. However, planning for the patient with the least capabilities will ensure that the space is adequate. In the situation in which the patient is totally dependent for bed repositioning, the space required needs to provide for additional people. With modern technology, using a well positioned ceiling track system and repositioning sheet, two healthcare workers can often complete the task. However, in situations where the repositioning is performed with friction-reducing devices and manual labor, the number of people increases with the patient weight. The author recommends the rule of allowing a minimum of one person per 100lbs of weight if repositioning using friction-reducing devices. The space around the bed now needs to provide for up to three HCWs on either side of the bed simultaneously. Additionally, some scenarios may occur that require a HCW at the head or foot of the bed as well. From the HCW safety perspective, the space must allow for proper ergonomic postures during nursing care activities.

Bariatric chairs have expanded widths up to 36 inches, as do the other pieces of bariatric equipment. The beds available for these types of patients can now be expandable up to 54 inches wide and typically 88 inches long. The space at the end of the bed must also be adequate to allow for the capabilities of the newer beds, including technologies such as sitting the patient in an upright position.

**Critical Care Room Width**

The width of the room is defined from the wall at the “side” of the bed to the wall at the other side of the bed. The width required to provide patient care needs to include the following:

- +78 inches (HCW space required on each side of the bed to move ergonomically correct is 39 inches).
- +54 inches (for the 1,000lb patient, the maximum bed available is expandable to 54 inches.)
- +36 inches (stretcher or chair space current market limits to 36 inches).
If a ceiling lift is used, then the room space is as listed above; if a floor lift is to be used, then an additional 36 inches of floor space would be required to ensure that a free space of 72 inches beside the bed is available for safe maneuvering of floor lift under load. If the equipment that the patient is being transferred to is wider than the 36 inches denoted (i.e., a 42-inch stretcher chair is used), then the additional inches should be added to the denoted space.

Therefore, the recommended minimum room width in the critical care setting for safe patient handling and care of the bariatric patient is a minimum of 168 inches (14 ft) when using a ceiling lift, and 204 inches or 17 feet if floor lift is in use. This space does not include the additional items fitting in the room, such as cupboards or specialty equipment. Additionally, the space assumes that when the seating chairs or lifts are not being used, they are removed from the area.

**Critical Care Room Length**
The room length (head of bed to wall at foot of bed) would require the following:

- +39 inches healthcare worker space at the head of the bed in the Intensive care setting
- +88 inches for bed length. Providing for the maximum bed width in bariatric beds.
- +36 inches for width of equipment that would need to pass by the foot of the bed (i.e., stretcher, wheelchair, lift device).

If the patient and workers would be passing by the foot of the bed side by side with a walking device, then the bed would need to be moved forward using the head space, or an addition 39 inches would be required to accommodate for the worker. Therefore, the recommended minimum room length for provision of care to the bariatric patient in a critical care environment is 162 inches, 13.5 feet. This does not include furnishing or storage or intensive care equipment space for such things as monitors.

Visitors are usually restricted to one at a time in this area, and usually for very short periods. In older facilities, curtains are often used to separate rooms and cubes, which make the entrance into the cube spacious. However, if a door is used it needs to accommodate the widest piece of equipment. With newer bed technologies, the beds are often expandable. If the bed is fixed at 48 or 54 inches, then a 60-inch split door might be required. If the bed can be reduced for transport, then the door width can be reduced to 45 inches. This will allow the bed that has a 43-inch width to pass through the entrance.

In an emergency room setting or critical care setting where space is limited and the existing patient areas are separated by curtains, consideration could be given to using two patient areas for one. Costly renovations might be avoided by modifying the curtain adjustability to quickly modify space to accommodate the bariatric admission.

**Acute care units**
Acute care units are the basic units in which patients are cared for when they are medically stable. They include medical, surgical, and specialty units. Obstetrical units and pediatric units also need to be considered as they are also admitting bariatric patients. The patients in these units often do not require the same amount of monitoring or one-to-one nursing as in the critical care unit. An acute care environment requires more space than would be required in the critical care unit due to the patients’ significantly increasing activity and the increased need for mobility.
equipment and furniture to remain inside the room. The exception being the space required at the head of the bed would be reduced. In this setting, several pieces of equipment can be in use simultaneously at the bed’s side. Examples of this would be a patient needing transferring from a recliner chair to a commode chair. Or the patient returns in a wheelchair and wants to sit in the bedside chair. If the maneuver requires a floor lift device then space is greatly increased. As well visitors are more commonly in attendance in larger numbers and the space needs to provide for visitor seating.

The space needs to accommodate for patient care activities and the equipment required to complete them. It is optimal and sometimes necessary to leave the patient equipment in the room. The room space may want to accommodate for the extra equipment to be accessible in the room, such as the bariatric floor lift devices, patient’s personal power wheelchair, scooter, or mobility devices (walkers). The patient handling task may include assisting the patient with several maneuvers, such as the following:

- Transfers from bed to chair/wheelchair/commode/stretcher and back;
- Transport in a wheelchair or commode to toilet and back
- Repositioning within the bed
- Wound care within the bed or outside of the bed in a chair
- Ambulating assistance, i.e. sitting, standing, or walking within the room and out of the room.

The type and method of the equipment and assistance required to perform or assist with a patient handling task is dependent on the patient’s characteristics (i.e., weight and its distribution, and height), ability to bear weight and assist, trunk and upper extremity strength, cognition, dementia, cooperativeness, and medical complications or conditions. Examples of conditions that would affect the patient’s ability to assist would be abdominal surgery, various tubes, pressure ulcers, and amputations.

The space required for mobilizing and ambulating the patient must consider the additional size of the patient, the equipment and the healthcare worker. The options for mobilizing are the following:

- Independent transfer with or without aids, such as mobile walking device, or cane. The space need is for clear floor space to accommodate the patient’s size and device.
- Mobilize with limited assistance from one healthcare provider and mobile walking device, cane or other device. The space now needs to accommodate for the patient and the worker to ambulate around the room side by side at times.
- Ambulation with two caregivers on either side of the patient while using an assistive device during ambulation. This will require enough width to travel with the worker on either side of the patient or one beside and one behind to transport medical devices, such as intravenous poles or oxygen tanks.
- When the patient cannot safely mobilize with assistance, then a transfer will need to be performed to assist the patient to sit up in the chair, wheelchair, or commode chair. This may be done with three caregivers using a mechanical transfer device, such as a floor lift or a standing and raising aid. If the ceiling lift is used, the transfer can often be completed with a minimum of two workers, and the required floor space may be reduced.
The above maneuvers now required additional space at the end of the bed if the patient and HCW will be using a pathway by the foot of the bed. Therefore, the room width would be as follows:

- +78 worker space on either side of the bed (39 inches)
- +54 bed width for 1000lb patient (can be reduced if smaller bed is to be used)
- +36 for bariatric seating or other equipment
- +36 inches to leave patient seating devices in the room or other equipment storage needs within the room (isolation requires floor lift to remain in room). This space is often neglected, and facilitates the 72 inches of clear floor space radius.

Therefore, the recommended minimum room width for the provision of care in an acute environment is 204 inches (17ft).

Room length in acute care shifts the need of the head space to the end of the bed:

- 88 inches for maximum bed length
- 36 inches for equipment or patient seated in a wheelchair
- 39 inches for worker space.

The recommended room length for provision if care of the bariatric patient in acute care is a minimum 163 inches or 13 feet 7 inches.

**Additional Space Consideration**

**Provision for the door.** Door width needs are based on the widest piece of equipment that requires passage. There are newer beds designed to transport the patient with power drive features and or expandable features. Most of these beds will fit through a 45-inch door, as will most other equipment. If the bed is not expandable and is one of the 48-inch or 54-inch beds on the market, then the door might have to accommodate its width as part of the facility evacuation plan. In this situation, a split 60-inch door (45 inch + 15 inch) is recommended.

**The room.** The space for bathrooms, showers, and long-term care facilities is not discussed in this text. However, the same process can be repeated to identify the space needs. The basic formula is equipment space, plus worker space, by task. Overall, facilities should plan for the entire facility by process mapping. It is an effective tool for planning care of the bariatric patient. The mapping would consider the pathways and areas that the patient would attend during an admission through discharge or death (and considering each department that might be part of the patient’s stay). This planning would identify the space and capacity problems that may be encountered in areas such as examining rooms, radiology, operating room, and the morgue. Consideration must also be given to transporting the patient/resident through halls and doorways with adequate width, and elevators with the appropriate capacity and space. Planning in the event of a death is important in facilities that will need to transport and temporarily house the body in a morgue. Morgue stretchers, body containers, and refrigeration areas are not usually equipped to manage the weight capacities required by bariatric patient/residents.

**Summary**

For quality care for bariatric residents, administrators need to use this information to understand the relationship between space, equipment, patient care, patient size, and furnishings. Space and
capacity planning throughout healthcare facilities must be given consideration specific to these documented details in order to safely and properly care for the dramatically increasing numbers of these patients. Including front-line HCWs in bariatric space design is essential. The recommendations for space that have been outlined are meant to be used as a guideline for designers and space planners, and are based on current practices and equipment. The overall space recommended for a critical care room is 13 feet 7 inches in length and a width of 14 feet. The overall space recommendations for acute care are a length of 13 feet 7 inches and a width of 17 feet.

Our everchanging and emerging technology quickly outdates space design recommendations. Emerging power devices for transport items, such as beds, stretchers, and wheelchairs, can eliminate the number of workers and possible worker space required. Provisions of power drive wheelchairs for the patient would eliminate the need for two nurses to push the device. The variables of size and technology change, but the principles of assessment needs for the space remain the same—tasks in room, worker space requirements, and equipment space requirements. Appropriate space is a critical step and urgent priority in improving the safety of the bariatric patient and the HCW during patient handling and nursing care tasks.

References