



# CHOOSING CRITICAL CARE BEDS?

## FACTORS TO CONSIDER WHEN BUYING BEDS FOR THE ICU

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**T**HANKS TO RECENT TECHNOLOGICAL ADVANCES, BEDS FOR CRITICAL CARE PATIENTS OFFER MANY FEATURES and functions that aid patient therapy and help caregivers. Hospitals must determine which of these features are necessary and appropriate for their patient population before making a purchasing decision.

ECRI Institute recently completed an evaluation of critical care beds intended for the ICU, rating selected beds based on key criteria (*Health Devices* journal, August 2010). We based our criteria and test methods on a review of the literature, discussions with clinical users, and the experience and judgment of ECRI Institute's team of medical technology experts, including biomedical/clinical engineering professionals and clinicians. For most tests, compliance with our criteria was determined by inspection of the beds.

The three principal characteristics that differentiated the evaluated beds were:

- Support surface versatility (compatibility with several suppliers' support surfaces)
- Bed-positioning capabilities
- Ease-of-use features

### SUPPORT SURFACE VERSATILITY

Patient beds can be purchased as either (1) a combination of a frame and a

replaceable surface (a simple mattress/overlay or a support surface) that can be changed according to hospital needs or (2) an integrated system (in which the mattress and frame interface with each other).

The most versatile beds are those that can be used with surfaces from both the bed supplier and a variety of third-party suppliers. Bed versatility is an advantage both clinically and economically. It may help to meet patients' clinical needs, and it may limit expensive bed rentals or allow use of already owned or less expensive surfaces.

However, there is a disadvantage to using third-party surfaces, in that some of the safety features of the bed will not function. For example, if a third-party surface is used to provide continuous lateral rotation therapy (CLRT), the bed won't be able to communicate with the support surface, meaning that rotation therapy could begin even though the bed's siderails are down.

### BED-POSITIONING CAPABILITIES

A patient may need to be in a particular position for clinical reasons or may need mobility assistance. One useful bed-positioning feature is the ability to convert the bed into a chair position, then move the bed upward and forward to aid patients in getting to their feet and exiting. Another useful feature is the ability to place the bed at a 20° angle in reverse-Trendelenburg position to help the patient get used to being upright.

### EASE-OF-USE FEATURES

Each bed we evaluated offers specific features that make it easier to operate. Examples include electronic brakes, siderails that are easy to maneuver, and a button that will automatically lengthen or shorten the bed; this last feature helps accommodate taller patients and is useful for maneuvering the bed in patient rooms and elevators.

Reminder alarms are available that can be set for specific clinical tasks, such

as obtaining specimens for the lab or weighing the patient. These may be useful for clinicians to increase accountability (the system documents whether the task was done and, if not, prompts for an explanation), and allow for remote notification for these issues. However, they also add to the cost of the bed.

#### A GLIMPSE AT THE TECHNOLOGY

Which therapeutic features to purchase will usually depend on the acuity level of your ICU. For example, the decision to buy pulmonary therapy often depends on how many patients the ICU typically has on ventilators. Some additional features include:

- **Specialty Surfaces** – Most of today's critical care beds offer specialty surfaces that are designed to provide skin care to reduce the risk of and assist in the treatment of pressure ulcers and other wounds, management of tissue loads, and more.
- **Pulmonary Therapies** – Examples include CLRT, percussion, and vibration, that are designed to reduce the risk of ventilator-associated pneumonia (VAP). Many bed suppliers tout the superiority of their CLRT based on the fact that their beds' degree of rotation is greater than that of other beds. But clinical literature has not definitely demonstrated that the degree of rotation has an impact on patient outcome.
- **Connectivity** – Medical devices and information technologies continue to converge. Critical care beds now offer a few options to do this. While connecting other medical devices (e.g., physiologic monitoring) to information systems may be higher on your priority list, the connectivity of ICU beds should be considered to meet possible future needs.

Bed connectivity is most often used for alarm notification. An alarm from a bed often needs to be transmitted to a caregiver, who may not be in the patient's room to hear it. This is most often accomplished by connecting the bed to a nurse call system, which permits alarms to be annunciated at a central location and broadcast to caregivers through means such as pagers and wireless phones.

Another connectivity application that is gaining quite a bit of interest is sending data from the bed to an EHR. Currently, facilities are interested in automatically capturing patient weight and head of bed status in the EHR, but in the future it will be possible to capture a wider range of data from the bed.

#### EVALUATION CRITERIA AND TEST METHODS

ECRI Institute's evaluations involve hands-on laboratory testing and on-site examinations in hospitals. We examine safety, effectiveness, cost, human factors, and other elements essential to purchasing and using medical technology safely and effectively. Evaluations are intensively reviewed by engineering and clinical professionals, both within and outside the organization.

Here are some of the criteria we used for the critical care bed evaluation:

- **Support Surfaces** – The supplier should offer support surfaces (e.g., low air loss, alternating pressure, percussion, vibration) as options for the bed. We prefer that the bed be compatible with other suppliers' support surfaces.
- **Alarms** – Regarding disabling and silencing, the bed should provide a means to readily:
  - Prevent an alarm from sounding unnecessarily (e.g., when a caregiver is repositioning a patient in bed)

– Silence a sounding alarm

- **Patient Controls** – Patient controls should be clearly identified, including both function and direction of movement, and their operation should be easy to understand. ⚙

**THIS ARTICLE IS AN EXCERPT** from ECRI Institute's evaluation "Critical Care Beds" (*Health Devices*, August 2010). For information about membership in the Health Devices System or the SELECTplus capital procurement advisory service, which both include access to the *Health Devices* journal, visit [www.ecri.org/healthdevices](http://www.ecri.org/healthdevices) or [www.ecri.org/select](http://www.ecri.org/select), or call (610) 825-6000, ext. 5891.

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#### BED SYSTEM ENTRAPMENT ASSESSMENT KIT—A VITAL SAFETY TOOL

FDA and ECRI Institute continue to receive reports of death or injury when patients become entrapped in openings within bedrails, between the bedrails, and between bedrails and mattresses, headboards, and footboards.

Responding to this hazard, FDA, in partnership with advocacy groups, and other governmental agencies, formed the Hospital Bed Safety Workgroup (HBSW) in April 1999, which has developed a Bed System Entrapment Assessment Kit.

The kit offers clinical guidelines and recommended practices to help health-care facilities reduce the occurrence of entrapment. Learn more at <http://www.nst.usa.com>.