SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

This study uses historical recommendations, a scoping study, and a systematic analysis of multiple studies to consider how research evidence relates individual bed space to patient safety issues of noise, falls, and infection transmission.

Space to care and treat safely in acute hospitals: Recommendations from 1866 to 2008

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Key Concepts/Context

Bed space, defined in this study as the area around an individual bed offering privacy either as a curtained or screened cubicle or a single room in a ward holding multiple occupants, is the most frequently repeated design envelope in an acute care hospital. Since patients, staff, visitors, and other people will occupy this space at one point or another for a variety of different purposes, a complex design challenge exists. In 1893, Florence Nightingale successfully argued for less cramped bedrooms and overall improvements in hospital designs. However, studies as recent as 1996 suggest that 21st century design professionals should create even more bedroom space to accommodate both patient and staff needs. Studies have shown that logical organization of equipment and space is important for both staff retention and patient safety, but studies with more empirical evidence are needed to support specific spatial recommendations.

Methods

The study was divided into three sections: a review of historical bed space recommendations, a scoping study that examined modern-day hospitals, and systematic review of different evidence-based studies that assessed the effects of bed space recommendations on patient safety.

Historical recommendations for bed spaces made between 1866 and 2008 were retrieved from both United Kingdom and international sources. Further guidance documents were obtained from the National Health Service (NHS) Estates archive. These data were analyzed to compare changes in bed space width and length (in meters) and area (in meters squared).

For a scoping study, five UK hospitals that had new building projects within the 10 years preceding this study were visited, and two to four empty bedrooms and cubicles were photographed and measured. These spaces were used as examples of

common medical and surgical adult wards in modern building designs. These designs were compared with relevant recommendations: Hospital 1 (opened in 1993) was compared to recommendations made by the Department of Health and the Welsh Office in 1986, while hospitals 2-5 (opened between 2001 and 2002) were compared to recommendations made by NHS Estates in 1997.

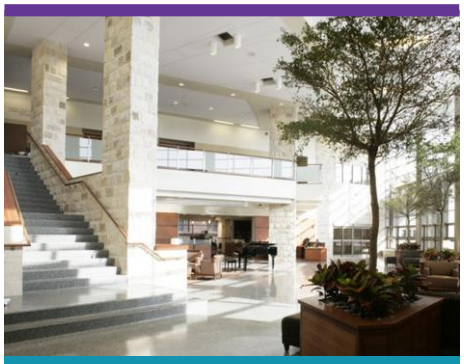
Evidence-based data were gathered from five international reviews and analyzed using the framework of a systematic review. Definitions of research questions, methods for identifying research studies, selections of studies for inclusion, quality appraisal of included studies, extraction of data, and data synthesis were evaluated to assess three outputs relating to spatial requirements and patient safety: falls, infection transmission, and noise.

Findings

The study of historical recommendations for bed spaces showed that spatial recommendations for bed space areas have increased steadily over 140 years. Increases went from under 7 m2 in the 1960s to approximately 8.2 m2 in the 1980s-1990s and just under 12 m2 from 2000 onward. Three international studies published since 2003 recommend a minimum of 3.6 m bed space width for both a room and cubicle. For bed space length, NHS Estates recommended 4.185 m, including 0.15 m for bedhead services, to accommodate resuscitation procedures. This includes 1 m at the bedhead for staff, 0.8 m at the foot end for equipment movement, and 2.235 m in bed length. Little empirical evidence was provided to support any of these recommendations. This may account for the lack of implementation that was observed in the scoping portion of the study. Of the five hospitals examined in the scoping section, all except one achieved the recommended bed space length of 2.9 m, but none met the recommended width of 2.9 m, resulting in smaller overall working spaces. During the systematic review of evidence-based studies, limited evidence was found to support the effectiveness of bed space recommendations for managing the patient safety risks of falls, infection transmission, or noise, but an overall lack of thorough studies on these risks in relevant environments was also noted.

Design Implications

Individual bed space sizes as well as the size and location of the beds themselves should be taken into consideration for the sake of patient safety and staff retention. There should be space at the head and foot of the bed for tasks such as resuscitation or equipment movement. Adequate space for patient, staff, and guest movement on the sides of the bed should be equally considered.



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Limitations

For the scoping section of the study, only five UK hospitals out of the 25 approached agreed to participate, resulting in a small sample size. Research examining the patient safety risks of falls, infection transmission, and noise was conducted mostly in critical care settings rather than general medical or surgical wards. This may present an increased presence of these safety risks.

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