Benefits of single patient healthcare rooms

Overwhelmingly the design intervention that positively affects the largest number of outcomes in a hospital setting is the provision of single-bed patient rooms (1). Reported benefits over double or multi-bed wards include improved infection control, reduction in noise, increased privacy and better for family support. These benefits lead to increased patient satisfaction.

**Infection control**

Hospital-acquired infections is one of the leading causes of death in the United States, killing more people than car accidents, breast cancer, or AIDS (1). The resulting yearly cost for U.S. hospitals is estimated to be $5 billion (1). Healthcare associated infections are also responsible for 50,000 deaths per year in the UK and lengthen hospital stays by 70% (2).

The use of single-patient rooms reduces airborne, contact and waterborne transmission of hospital-acquired infections by increasing isolation capacity, facilitating the thorough cleaning of rooms and the maintenance of air quality and also possibly increasing hand-washing compliance by healthcare workers (1).

Several papers have supported the association between single-bed rooms and reduced infection rates, including the review by Dettenkofer et al on the relationship between architectural design and nosocomial infections (3) and Chaudhury et al’s review on the advantages and disadvantages of single- versus multi-bed accommodations (4). Also, Calkins and Cassella surveyed research on nosocomial infections in nursing homes and similarly concluded that private bedrooms reduce the risk of infection as compared to shared bedrooms (5).

Providing a high proportion of single rooms in hospitals conveys a major safety advantage, because it enables separation of patients upon admission and makes it possible to prevent cross-infection from unrecognized carriers of pathogens (1). Even if patients are screened for MRSA, or other pathogens immediately upon admission, processing test results often requires two or three days, during which time environmental surfaces in the rooms of infected patients quickly become extensively contaminated, creating pathogen reservoirs that will be touched by staff and possibly by patients (1 & 6). Accordingly, assigning an unidentified carrier initially to a multi-bed room heightens the risk of cross-infection. By the time test results revealing that the patient is infected are available, it may be too late to isolate the individual, because transmission to one or moreroommates may already have occurred (1).

**Reduction in noise**

Studies have shown that noise in hospitals has several effects on patient health and recovery including disturbed sleep, although the percentage slightly varies, it has generally been shown that roughly 11% to 20% of arousals and awakenings are due to noise (7 & 8).

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Sleep is fundamental to human health in general and critical to patient recovery. Alertness, mood, behaviour, coping abilities, respiratory muscle function, ventilatory control, healing time, and length of stay are just a few of the potential impacts of patient sleep disturbance or deprivation (9).
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**Reduction in noise**

In addition to worsening sleep quality, noise elevates psychological and physiological stress in patients, as indicated by negative feelings such as anxiety and annoyance, and detrimental physiological changes such as elevated heart rate and blood pressure (1). There is some evidence that noise may even contribute to increased lengths of hospital stay (10). Excessive noise affects staff as well as patients, with noise implicated in staff stress levels, burnout and emotional exhaustion (9 & 11).

Another study revealed that noise induced stress could account for 6% of headaches at work, as self-reported by nurses in critical care areas.

When noise levels were reduced, staff report less stress and overall better working environments (9 & 12).

By closing the door to single rooms, much of the ward/unit background noise can also be reduced. In a study by Chaudhury et al, nurses rated single rooms as effective in reducing noise levels. The results of surveys administered to 77 nurses regarding their perceptions of single rooms demonstrated that nurses believed single rooms provided a more restful environment with less noise and overall disturbance, which could contribute to improved recovery rates (9 & 13).

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**Increased privacy**

In one study (a controlled trial with a sample of 108 patients in an emergency department of a major teaching hospital), patients in multi-bay curtained areas were compared with those in solid-walled rooms, believed more often that others could hear them, that they could overhear others, and that others could inappropriately view them. This perceived invasion of privacy led to 5% of the patients in the curtained areas admitting that they withheld aspects of their medical history and refused parts of their physical examination (9, 14-17).

Again nurses also have a preference for single rooms. Results from a questionnaire to 77 nurses from a variety of settings demonstrated that 85% believed single rooms were more appropriate for patient examination, and 82% for history taking (9 & 13).

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**Family support**

A clear advantage of single-bed rooms in fostering social support stems from the fact that they provide more space and furniture to accommodate family presence. Some research suggests that open-plan multi-bed rooms deter family presence and therefore reduce social support. One reason is that multi-bed rooms greatly reduce privacy for patient-family interactions compared to single rooms, and they are much more likely to have restricted visiting hours (11).

Compared with multi-bed rooms, single-bed rooms provide enhanced privacy, encourage family visits and social interaction, and are more likely to provide space to accommodate visiting relatives and friends (10).
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Increased patient satisfaction

The major advantage of single-bed rooms is reflected in Press Ganey's satisfaction survey, which obtained data from 2.1 million patients in 1,462 US healthcare facilities during 2003. Results showed that satisfaction with noise levels was on average 11.2% higher for patients in single-bed rooms than for those in multi-bed rooms.

This pattern held across all patient categories and for different ages, genders, and facility sizes and types (16 & 18). This is an extremely large difference, considering that it can be difficult for hospitals to increase satisfaction scores by even two or three percentage points (1).

According to Lawson & Phiri, patients feel frustration and unpleasantness of not being able to control their privacy and community as you would normally and naturally do in everyday life. Choosing whether your door is open, ajar or shut, for example, is something we all do very frequently in the domestic and work environment and yet the ability to do this is normally denied to the bedridden patient (18).

Considering all the above-mentioned benefits, it is no surprise that patients are more satisfied with their hospital stays when they are placed in single-bed rooms (1).
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