

Improving the Patient's Environment: the Ideal Intensive Care Unit

Améliorer l'environnement des patients : le service idéal de réanimation

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Abstract Recent medical literature has been reporting the effects of intensive care unit (ICU) design on patients' and family members' well-being, safety, and functionality. Features of ICU design linked to the needs of patients and their family are single rooms, privacy, quiet surrounding, exposure to daylight, views of nature, prevention of infection, a family area, and open visiting hours. Improving the ICU environment is shown to increase the patients and family members' satisfaction while reducing the duration of delirium. An organization based on the respect of the needs of the patients and their family is mandatory in designing a new ICU. The main aims in the design of a new ICU should be patient-centered care and future-proof concept.

Keywords Intensive care unit · Environment · Design · Patient-centered care

Résumé Des études récentes ont démontré l'impact d'une conception modernisée des services de réanimation sur la sécurité des patients, ainsi que sur leur bien-être et celui de leurs proches. Des chambres individuelles, un environnement calme, l'exposition à la lumière du jour, la vue sur un paysage aussi naturel que possible, l'ouverture des horaires des visites 24 heures sur 24 et l'existence d'un espace d'accueil dédié aux familles sont aussi essentiels pour améliorer la prise en charge des patients que la prévention des infections acquises en réanimation. Un environnement répondant à ces critères permettra d'améliorer la situation des patients, le perçu par leur famille et probablement de réduire la durée du delirium. Une organisation mieux fondée sur les besoins du patient et de sa famille est nécessaire pour concevoir une

approche résolument novatrice du fonctionnement des unités de réanimation.

Mots clés Réanimation · Environnement · Conception · Soins

Introduction

During the years of evolution and institutionalization, nursing and medical care were focused mainly on the improvement of patient's illness and less on care of family and safety [1]. Recently, more insight was developed regarding the mental stress of being an intensive care patient or a next of kin [2,3]. Especially during the last decade, the physical and psychological well being of the intensive care unit (ICU) nursing and medical personnel and the safety of the procedures in patient care have been carefully documented [4,5]. Due to this reason, a different approach is necessary today in planning, designing and building an ICU, in order to provide a good environment to the patients and their families.

Fundamental structure

It is not possible to create an intensive care department that produces the best possible environment suitable for critically ill patients and their relatives without first defining a vision. The best possible environment allows physicians and nurses to focus on the patient. Patient-centered care, safety, functionality, innovation and future-proof concept are the important issues in the design of the new department [5–7]. Concepts can be developed mainly by concentrating patient-centered care which will dictate the architecture. Old patients and their family members are the best source for the necessary information. They should be interviewed to evaluate the present condition and shortcomings they have experienced. Finally, the developed concepts should be tested first by constructing a mock-up room as part of a new ICU design or renovation [8].

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Patient centered care

Patient centered care concept is a combination of the care of the patient and the family.

Patient care

It has been a common practice for many years to build ICUs as a ward. The number of beds vary from a few up to many. However, it has recently been shown that patients may suffer from sleep disturbances and restlessness due to high level of noise in ICUs [9–13]. On the other hand, private rooms with closed doors can provide quiet environment. In a study performed by Dennis et al. [9], patients were significantly more likely to be observed sleeping when noise and light was reduced. The results of other studies were in accordance with these findings and have identified noise as a cause of sleep disturbances [10–12].

Lower rate of infection is reported with private rooms compared to multi-bed environments [14]. Ulrich et al. [5,15] extensively discussed the effect of single-bed rooms in reducing airborne infection and contact transmission. Moreover, Bracco et al. [16] found lower risk of acquisition of pathogens for patients cared in private, compared with open ward or multi-bed rooms. Various studies show that single-bed rooms reduced or prevented methicillin-resistant *Staphylococcus aureus* (MRSA) infections compared to multi-bed rooms in various healthcare settings as well as ICUs [17–19]. With these data, there is strong suggestive evidence in the literature, that single rooms limit transmission of pathogens to other patients.

Next to patient privacy, single rooms also help to ensure that the patients are able to talk to family members and care providers without being overheard or interrupted [20]. Fridh et al. have reported that [21] the relatives of the dying patients who were transferred to a private room were satisfied for the privacy they had. The family was able to have their own private sphere and it was possible to allow only the family members to enter.

Single rooms are shown to be related to less medication errors, improved social support by patients' families, better communication between patients and staff, and an overall increase in patients' satisfaction with care [22]. Recently, Jongerden and co-workers [23] have reported the results of a before–after study performed 2 months before and 2 months after the migration of an intensive care unit with multiple beds on a ward to a newly built ICU with all single rooms. They showed an increase of 6% in family and patient satisfaction with ICU experience in the new ICU environment consisting of noise-reduced, single rooms with daylight, adapted coloring and improved family facilities.

Natural light is essential for the well-being and orientation of the patient. It helps re-orientation and maintenance

for day and night rhythm [13]. Trochelman et al. [22] have stressed that natural light in patient care areas reduced agitation in elderly patients, decreased length of stay, lessened the need for pain medication, and reduced depression. Daylight also results in higher satisfaction for the staff [5]. Moreover, having views of nature or gardens from patients' rooms is suggested to reduce stress and pain [6,24–26].

An important factor for consideration is to design an ICU where the rooms do not remind a hospital but enable the patient to feel at home [13]. Natural furniture like clock, armchair and lamp can be used for this purpose. Soft wall and ceiling colors should be used in each room with as few irregularities as possible. Delirium often occurs in patients in the intensive care. Recently, Zaal et al. studied the incidence of delirium in an ICU designed to reduce noise and with improved exposure to daylight, in comparison to patients admitted to an open ward ICU [27]. Although the incidence of delirium was similar in both designs, a shortening of delirium was observed in patients who were admitted to a single-room ICU.

Family care

The visiting relatives should not be forgotten as they have significant effects on the patient and from the aspect of their own comfort and peace of mind. Areas for relaxation, catering and internet facilities are important factors to make the relatives to feel as welcome and as comfortable as possible [6].

Way finding is important for the visiting family [13]. Patient room numbers should be clearly marked. Directional signage should be easy to read, understand, and follow. Way finding techniques, such as landmarks, art and floor patterns may be considered for this purpose.

Special visiting hours is an outdated concept in a modern ICU. The family members should be able to visit the patient any time they would like to do so. Therefore, twenty-four hours visiting policy should be applied [28]. A quieter atmosphere will be achieved because the visits of family members will not be concentrated between certain hours.

Bedrooms with bathroom and shower can be built in the unit special situations where the family cannot leave the hospital. Some ICUs prefer to locate the family rooms next to the patients' rooms [13]. On the other hand, the family needs mental rest. For this purpose, the area chosen for family members can be situated in a quiet corner of the department, avoiding the exposure to the daily activities of the ICU.

Conclusion

An organization structured on the needs of the patient and the family is mandatory in designing a new intensive care. Patient centered care and future-proof concept should be the

main aims in the design of the new department. Materials, apparatus and building will get old but the concepts such as daylight, quiet surrounding and privacy will certainly endure the test of time.

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