

EDITORIAL



Greenery and outdoor facilities to improve the wellbeing of critically ill patients, their families and caregivers: things to consider

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There are several stunning outdoor spaces created for patients admitted in the intensive care unit (ICU), family members and ICU caregivers such as the “Balcony of Hope” in the Macarena University Hospital in Seville and the “Secret Garden” in the Derriford Hospital in Plymouth. We are expecting our own garden and outdoor facility adjacent to the ICU in October 2023 (Supplementary Fig. 1).

The above mentioned examples are the result of a growing body of evidence highlighting the importance of healing environments in the ICU [1]. The benefits of visiting or viewing nature and green environments play an important role in the concept of healing environments [2]. The ancient Greeks already recognized the divine power of nature and constructed the Asclepieia, which were the first hospitals in Europe with a focus on the presence of water [3]. Throughout history, incorporating nature and green environments has been an integral component of hospital design [3]. However, nature has thus far received little attention in the design of ICUs. This is unfortunate because the stress-reducing effects of nature could have significant relevance in ICUs [4]. The ICU is a highly stressful and demanding environment for patients, ICU caregivers, and family members of patients. Research has shown that the physical design of the ICU can have a substantial impact on patient outcomes, staff well-being, and overall healthcare quality [5]. The source of light, the amount of different noises, sound level and physical position of a patient all play a significant role in shaping the patient’s experience during their admission

[5]. Noise and lack of space were identified as factors that heightened the workload and hindered ICU nurses’ capacity to deliver high-quality and safe patient care [5, 6]. While several environmental interventions can contribute to healing, a garden seems especially well-suited as it promotes an overall sense of wellbeing and hopefulness, alleviates depressive symptoms, and can alleviate stress [7]. Although the effects of an ICU garden on these outcomes have not yet been studied, other studies offer valuable insights to base hypotheses on the effectiveness of an ICU garden in an ICU setting as well.

Contact with greenery in daily life has been shown to be beneficial for humans in multiple ways: it improves air quality, cognitive function, and social connection [8]. Additionally, being surrounded by greenery provides various physical advantages, including reduced blood pressure, decreased stress and improved sleep [9]. Several studies have been conducted on the advantages of greenery in hospitals. Exposure to hospital green spaces has been associated with a range of positive health outcomes, including improved mental health, reduced anxiety, and faster recovery from illness or surgery [10]. Restoration from stress and improved mood was reported by nearly all users of hospital gardens in California, including patients, family members, and employees [11]. Other studies suggest that using gardens can help to alleviate stress in medical professionals, increase job satisfaction, and may contribute to the retention of qualified personnel [12, 13]. The many potential benefits of greenery and stress levels in ICUs raise the question of why aren’t more ICUs investing in green environments. This may be partially explained by a lack of knowledge about the importance of greenness among decision-makers. It is therefore essential to share available knowledge with

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these decision-makers and demonstrate the benefits of implementing a garden in a hospital setting adjacent to the ICU. First and foremost, it can benefit our patients. In a garden, patients have the opportunity to be surrounded by plants and a natural environment which can provide a much-needed change of scenery from the confines of the unit where they spend nearly 24 h a day. Furthermore, designing an outdoor garden area with ample natural elements close to the ICU may effectively ease stress levels among family members of ICU patients [14]. The garden may provide a peaceful and soothing environment with access to natural light, offering a respite from the stress and anxiety of the busy and noisy ICU. Moreover, exposure to natural environments may help improve mood and reduce stress, anxiety, and burnout, which are common among healthcare workers [15]. This may, in turn, help to increase job satisfaction and overall well-being. In short, looking at the available evidence from other populations, the ICU garden could also have multiple beneficial effects, which should be shared with stakeholders.

When considering the establishment of an ICU outdoor garden, various aspects should be considered. Stakeholders and key leaders should be enthusiastic

and committed to the project, there should be sufficient budget and time to implement, deliver and maintain the garden, potential users should be involved in the design, the garden should be designed to provide a sense of privacy, safety, and security for patients and their families, the garden should be easily accessible, and stakeholders should support the use of the garden with incentives and rewards and ideally aspects of sustainability should be taken into account. A summary and further descriptions of the aforementioned aspects can be found in Table 1.

It may be challenging to establish a complete outdoor garden in certain hospitals. Luckily, there are also creative alternative initiatives and practical solutions available to green the environment that can bypass major construction difficulties. For instance, window gardens adjacent to ICU patient and family rooms or incorporating nature-themed artwork or pictures which allows them to have at least a view of nature. Other examples of elements that can contribute to a healing environment are a quiet atmosphere, utilizing natural light to set the circadian rhythm, and incorporating nature-inspired elements such as water therapy for hands and feet or using nature-based soundtracks. These initiatives can help

Table 1 Aspects to consider before the creation of an ICU outdoor garden

Domain	Description
Sharing evidence	Supportive evidence for the positive effects of the ICU gardens on patients, family members and caregivers should be shared with stakeholders
Initiative	There is willingness to change and create an outdoor facility and garden. With local champions committed to consistently working on this project, the likelihood of successful creation increases
Budget and time	There is sufficient budget and time to implement, deliver and maintain the ICU garden. Financial resources are an essential consideration when planning an ICU garden. Expenses associated with designing, constructing, and maintaining the garden should be carefully budgeted and coordinated. There are various sources of funding that could be explored for an ICU garden project such as obtaining funding from the hospital, applying for grants that focus on healthcare or environmental initiatives, or private donations and fundraising events. Apart from financial resources, time for those involved in the implementation delivery and maintenance of the garden is also essential
Involve potential users in the design process	Patients, family members and caregivers should be involved in the design process and preferably be part of the project
Design	The garden should be designed to provide a sense of privacy, safety, and security for patients and their families [11]. The design should be accessible for patients in beds and care chairs. Incorporating natural elements such as plants, water, and natural light is important to engage senses (smell, touch, scent, sight). These elements should be placed on various heights so that patients in beds and chairs can also experience them. Preferably, the ICU garden also contains a section where the ICU caregivers can take breaks
Accessibility	Ideally, the garden should be located adjacent or near the ICU to facilitate access to and from the outdoor facility. Not only for patients and family members but also for ICU caregivers who will be more easily called upon if other incidents in the ICU may call their attention. The garden should have easily accessible doors and should be accessible for bedded patients. Information about the existence of the garden is created
Safety	It is important to consider safety measures when designing the garden, such as using non-toxic plants and implementing secure fencing, especially if it is located above ground level
Maintenance and sustainability	The garden design should prioritize easy maintenance with careful consideration about responsibilities for its upkeep. Preferably, plants should be selected that are native to the area and locally sourced. This promotes sustainability and enables the plants to flourish in the local climate without requiring excessive watering or maintenance. Implementing practices such as rainwater harvesting and using solar-powered lighting can also contribute to the garden's sustainability
Organizational support	The ICU garden is in line with the needs, norms and values of those involved and can be integrated into the care process. Key leaders show commitment and use of the garden is supported with incentives and rewards

create a calming and therapeutic environment within the constraints of the indoor setting. Incorporating the healing power of nature into ICU environments is not just a visionary pursuit; it's an imperative step towards enhancing patient recovery, uplifting family well-being, and nurturing the resilience of our ICU caregivers.

Supplementary Information

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Declarations

Conflicts of interest

No conflicts of interest exist regarding this article and all co-authors have consented to the submission.

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