ICU
MANAGEMENT & PRACTICE

Past, Present, and Future of Sustainable Intensive Care

Climate change is a critical challenge of the 21st century, with fossil fuel combustion being the largest contributor, responsible for over 75% of greenhouse gas (GHG) emissions. The global healthcare industry significantly impacts the environment, accounting for up to 5% of global carbon emissions, with the U.S. contributing the largest share. Nations with high carbon footprints, such as Australia, attribute substantial percentages to healthcare, and even countries with lower overall footprints, like China, see significant emissions from their medical supply chains. The shift to plastic and disposable products has expanded healthcare services but at a high environmental cost. Other contributing factors include procurement waste, medical equipment energy consumption, and patient travel.

A recent paper reviews global sustainability initiatives in healthcare, highlights efforts in critical care and proposes a pathway to greener ICUs based on identified challenges and successes.

Waste management in critical care has garnered significant attention, with studies highlighting wasteful practices. Efforts to manage waste include principles like "reduce, reuse, recycle, and rethink," and integrating Lean Six Sigma for continuous improvement in waste elimination. Various waste management interventions have been explored, such as policy changes, educational programmes, and operational adjustments.

Research has revealed barriers and facilitators to environmental sustainability. Barriers often stem from patient care demands and organisational priorities, which can deprioritise environmental concerns. Facilitators include functional waste sorting facilities, training, and effective internal communication about sustainability practices. Nurses reported that patient care workloads and organisational cultures focused on budget constraints hindered environmentally sustainable practices, while supportive facilities and clear communication could enhance engagement in responsible practices.

The World Health Organization (WHO) emphasises sustainable healthcare practices, urging member states to address environmental concerns. Globally, healthcare systems, including ICUs, have integrated sustainability efforts. European countries, such as the UK, Canada, Australia, and New Zealand, lead this movement through educational and advocacy initiatives.

The European Union's Green Public Procurement (GPP) process, launched in 2008, guides sustainable purchasing decisions, including ICU equipment and supplies. Australia has launched significant initiatives like the National Health Sustainability and Climate Unit and the National Health and Climate Strategy, promoting energy efficiency and responsible resource consumption in healthcare.

In New Zealand, 65% of ICUs, and 40% in Australia have dedicated clinicians or teams for green initiatives. The Australian report "ANZICS: A Beginners Guide to Sustainability in the ICU" and its toolkit have been influential, though not widely translated into clinical impact in the U.S.

The Hospitals for a Healthy Environment (H2E), launched in 1998 as a collaboration between the EPA and the American Hospital Association, aimed to help hospitals adopt green practices, including waste reduction. While some progress was made, there has been no recent advancement in waste and pollution reduction initiatives.

The U.S. Green Building Council (USGBC) introduced the Leadership in Energy and Environmental Design (LEED®) reference guides and rating systems for healthcare facilities, including critical care areas. LEED for Healthcare recommends sustainable design and operations, such as energy-efficient technologies, which contribute to reduced energy consumption and costs.

The Green Guide for Health Care™ (GGHC) complements LEED for Healthcare, offering a voluntary self-certifying tool for sustainable healthcare facility design and operations.

Houston Methodist (HM) is dedicated to establishing an environmentally sustainable healthcare institution, comprising eight hospitals across the Greater Houston metropolitan area, with plans for expansion. Earlier this year, HM established an Office of Sustainability to oversee responsible resource use, aiming to balance economic viability, social equity, and environmental protection.

HM has initiated several environmental sustainability projects, including installing solar panels on main buildings and launching food composting initiatives. The system focuses on waste prevention through recycling, reusing items, and sustainably disposing of expired materials. Houston Methodist Hospital is constructing a 26-story tower featuring the Centennial Rooftop Garden.

In ICU settings, HM is implementing projects to reduce unused supply waste and unnecessary oxygen usage. These initiatives involve staff education and changes to supply management practices. Additionally, HM launched a virtual ICU programme to meet critical care needs, reducing travel-associated carbon emissions through remote monitoring and consultations.

Grounded in Houston Methodist's (HM) Green ICU efforts, a 3-step pathway is proposed to inform sustainable critical care initiatives:

Step 1: Establish a Baseline

Collaborate with various departments and stakeholders to quantify the carbon footprint of the ICU and the cumulative footprint of all ICUs in the healthcare system. Conduct a comprehensive audit, assessing the financial and nonfinancial costs of ICU operations, including GHG emissions, solid waste generation, and transportation impact. Set reduction targets over a defined period.

Step 2: Develop Intervention Programmes

Form alliances and partnerships, leveraging sustainability offices or executives within the healthcare system. Implement specific interventions targeting major sources of pollutants, both inside and outside the ICU, to achieve reduction targets.

Step 3: Create Green ICU Teams

Form Green Teams comprising ICU staff from various roles to implement environmental interventions. Utilise educational tools focusing on the 3Rs (Reduce, Recycle, Rethink) to increase awareness of the impact on resource usage. Prioritise patient care, ensuring sustainability efforts do not compromise safety or override medical judgement.

Green Team Structure

- Recycle Team: Implement recycling programmes to reduce landfill waste and costs, focusing on sorting and recycling plastic medical supplies.
- Reduce Team: Identify conservation opportunities to minimise surplus medical supply waste, raising awareness of infection control policies and supply costs.
- Rethink Team: Provide education on recycling and conservation efforts, categorising recyclable items and raising staff readiness for sustainability policies and processes.

Periodic progress checks are essential to measure programme effectiveness while ensuring patient care quality and safety remain paramount. Initiatives like transitioning to reusable equipment should not increase infection risk for ICU patients.

A systems approach involving stakeholders is crucial for effective recycling of medical supplies, reducing unnecessary usage, and raising awareness of the importance of such initiatives. The proposed pathway requires minimal additional resources and is adaptable to health systems with varying resource levels.

Source: Critical Care

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