

THE FUTURE ICU



KEY CHALLENGES IN CRITICAL CARE

- Ageing Population
- Severity of Illnesses
- Hospital-Acquired Infection
- Clinical Staff Shortage
- Technological Innovations
- Environmental Concerns

Source:
<https://www.ncbi.nlm.nih.gov/pubmed/21921718>



WHAT WILL THE FUTURE BRING?

- Hospitals will be smaller, but ICUs will be bigger
- Hospitals will focus mostly on acute patients
- Less severe patients will be managed via telemedicine or in less acute facilities
- Artificial intelligence will take over time-consuming tasks such as ordering exams, and blood tests
- Augmented reality will enable faster diagnosis and early treatment
- Virtual reality will bring families together
- ICU survivors will have an improved quality of life through early mobility and personalised rehabilitation

Source:
<http://newsletter.esahq.org/the-future-of-the-icu/>



APPLICATION OF AI IN THE FUTURE ICU

- Finding complex relationships in large volumes of data and improved analysis of multiple variables to predict outcomes
- Developing algorithms to increase prediction accuracy
- Personalised sedation and analgesia
- AI-powered alert system, patient monitoring, and alarm algorithms

Source:
https://www.researchgate.net/publication/330291640_Artificial_intelligence_in_the_intensive_care_unit



THE 3P's PYRAMID

- One therapy for all in Poorly characterised patient populations
- Appropriate therapies for small subgroups of patients in Personalised medicine
- Customised treatments for each individual in Precision medicine

Source:
<http://newsletter.esahq.org/the-future-of-the-icu/>



MORE POSSIBILITIES?

- Infusion pumps that eliminate manual dosage calculations
- Mechanical ventilators that track oxygen levels and recommend changes
- Sensors on compression devices
- Monitors to track optimal bed positioning
- Single, integrated alarm systems
- Stationary bicycles to fight ICU-induced weakness

Source:
https://www.hopkinsmedicine.org/news/publications/hopkins_medicine_magazine/features/winter-2017/tomorrows-icu