

The Future of Critical Care: Innovations in Patient-Centered Technology

Corina VERNIC^a, Balázs CSUTAK^b, Ovidiu Horea BEDREAG^c, Sebastian-Aurelian ȘTEFĂNIȚĂ^d, and Călin MUNTEAN^{a,*}

^a Department of Medical Informatics and Biostatistics, “Victor Babeș” University of Medicine and Pharmacy, Timișoara, Square Eftimie Murgu, no. 2, 300041 Timișoara, Romania

^b Department of Anesthesia and Intensive Care, Emergency County Clinical Hospital "Pius Brînzeu" Timișoara, Liviu Rebreanu Blvd, no. 156, 300723 Timișoara, Romania

^c Department of Anesthesia and Intensive Care, “Victor Babeș” University of Medicine and Pharmacy, Timișoara, Square Eftimie Murgu, no. 2, 300041 Timișoara, Romania

^d Department of Computer Science, West University of Timișoara, 300223 Timișoara, Romania

E-mails: cvernic@umft.ro; csutakbalazs@yahoo.com; bedreag.ovidiu@umft.ro; sebastian.stefaniga@e-uvvt.ro; cmuntean@umft.ro

* Author to whom correspondence should be addressed; Tel.: +40 726 707 113

Abstract

In the landscape of modern healthcare, the evolution of critical care has been marked by the integration of innovative technologies and the emergence of patient-centered approaches. This study aimed to explore the potential of Artificial Intelligence (AI) in shaping the future of critical care, using data collected from Centricity High Acuity data warehouse from the Anesthesia and Intensive Care Clinic and the operating theater from Emergency County Clinical Hospital "Pius Brînzeu" Timișoara. The existing healthcare landscape is characterized by the complex balance between technological advances and patient-centered care. The advent of AI presents an opportunity to revolutionize critical care, offering real-time insights and personalized interventions. This research seeks to harness the capabilities of AI to enhance patient outcomes in critical care scenarios. The study was conducted at a tertiary care hospital, using a mixed-methods approach that involved retrospective analysis of patient data from Centricity. The AI algorithms were trained on historical data to predict patient deterioration patterns, enabling timely interventions and proactive management. Results demonstrated that the integration of AI-driven insights from Centricity High Acuity data warehouse significantly improves patient outcomes. AI-assisted interventions led to reduced instances of adverse events, shorter lengths of stay, and improved resource utilization. The AI algorithms demonstrated high accuracy in predicting patient deterioration, enabling early interventions and preventing complications. In conclusion, the integration of AI technology using data from Centricity High Acuity data warehouse holds immense promise for the future of patient-centered critical care. The results indicate that AI-driven interventions can enhance patient outcomes, reduce healthcare costs, and improve resource utilization. As healthcare continues to embrace AI, the potential for transformative advancements in critical care is evident, paving the way for a new era of innovative and personalized patient-centered care.

Keywords: Centricity; Artificial Intelligence (AI); AI-driven intervention

