

EP0424 Pressure ulcer prediction in intensive care units using artificial intelligence: A scoping review

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Aim: Pressure ulcers significantly challenge healthcare, affecting quality of life and straining systems. Despite most being preventable, these injuries remain common in Intensive Care Units (ICUs). Effective risk identification is crucial, but traditional scales have limitations, prompting the development of new tools. Artificial intelligence (AI) offers a promising approach to dynamically identify and prevent pressure ulcers in critical contexts. This review assesses the literature on AI technologies for predicting pressure ulcers in critically ill patients in ICUs, identifying knowledge gaps and guiding future research.

Method: Using the Joanna Briggs Institute's scoping review methodology, this study focuses on AI technologies for pressure ulcer prediction (C) in critically ill patients (P) admitted to ICUs (C). The protocol was previously registered on the Open Science Framework. Search was conducted across relevant electronic databases yielding 137 publications.

Results / Discussion: Fourteen studies were included. Most used cohort designs with electronic health records to train machine learning algorithms. AI models were trained using 6 to 86 variables, with the best models showing Area Under the Receiver Operating Characteristic Curve (AUROC) values ranging from 0,73 to 0,99, reflecting high predictive accuracy. One publication studied the impact of an AI model in clinical practice, achieving a reduction in pressure ulcer prevalence from 21,26% to 4,04% and a decrease in ICU length of stay from 7,63 to 5,17 days, demonstrating high adherence and significant clinical impact.

Conclusion: AI technologies offer a dynamic solution to improve the timely prediction of pressure ulcers, addressing limitations of traditional tools. This review synthesizes current findings and directs future research toward enhancing ICU care.

EP0565 A challenging disease to treat: Pressure ulcer and reconstruction options

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Aim: Decubitus ulcers, also known as pressure ulcers, develop in areas where tissues are subjected to prolonged pressure, typically over bony prominences. These ulcers are almost always accompanied by ischemic tissue loss. Pressure ulcers most commonly affect the sacrum, heels, ischium, and trochanters. Treatment strategies depend on the ulcer's stage and severity, often requiring complex wound care and surgical interventions.

Method: This study included 26 patients treated between February 2023 and August 2024 for pressure ulcers at stage 4, with defect sizes ranging from 2x3 cm to 12x18 cm. In defect repair, 12 patients underwent reconstruction with a superior gluteal artery perforator (SGAP) flap, 3 with a lateral sacral artery perforator (LSAP) flap, 2 with an inferior gluteal artery perforator (IGAP) flap, 2 with a gluteus maximus muscle flap, 2 with a tensor fascia lata flap, and 5 with a rotational flap.

Results / Discussion: Wound detachment due to infection occurred in 8 patients. These infections were managed with antibiotics and debridement, followed by secondary suturing to close the defects. Partial flap loss due to venous insufficiency was observed in 4 patients who underwent SGAP flap reconstruction. Two of these patients were managed with debridement and dressings, allowing the defects to heal secondarily.

Conclusion: The treatment of decubitus ulcers is often challenging due to the patients' comorbidities and the characteristics of the wounds. In advanced-stage pressure ulcers, primary closure is rarely feasible, and various reconstructive options must be considered. Optimal wound care, control of infections and comorbidities, and the selection of an appropriate reconstruction technique are essential for successful treatment. Thus, a multidisciplinary approach is crucial to achieve durable outcomes in these patients.