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## **Innovations in Clinical Pharmacy Practice: Implementing New Technologies in ICU Medication Management**

**S. YUGITHA (PHARM.D (PB) - II YEAR)**

Under the guidance- Dr. M. DHEENADHAYALAN

Department of Pharmacy Practice, School of Pharmaceutical Sciences, Vels Institute of Science, Technology and Advanced Studies, Pallavaram, Chennai 600117, Tamil Nadu, India.

Email ID- [syugitha2@gmail.com](mailto:syugitha2@gmail.com)

### **Abstract**

Critically ill patients are at escalated risk for drug-related problems (DRPs) due to complex pharmacotherapy, organ dysfunction, and rapidly fluctuating physiological conditions. Clinical pharmacists (CP) have emerged as an essential integral member of the multidisciplinary intensive care unit (ICU) team, contributing significantly in medication management to enhance patient safety and improve outcomes. The advancement in technologies and digital health is reshaping the clinical pharmacy practice in ICU offers a new opportunity to optimize pharmacotherapy for critically ill patients. The main objective of this review is to explore the integration of technologies and CP into ICU medication management to evaluate patient outcomes and resource utilisation for critically ill patients. A systematic review on implementation of new advanced technologies and role of CP in ICU for critically ill patients. Focused areas include electronic prescription, digital error prevention system, personalized medicine, AI-driven drug therapy recommendations, telehealth platform, therapeutic drug monitoring, dose adjustment, medication reconciliation. Integration of CP and technologies into ICU team reduces medication errors, adverse drug events and unnecessary resource utilisation. Their intervention optimizes drug selection and dosing, reduces interactions and tailor therapy according to individual patient needs which enhances safety and quality of care. CP expertise in medication management enhances therapeutic efficacy and patient safety in critically ill patients. Technology-supported medication reviews accelerate therapy adjustments and boost inter professional collaborations. Novel technologies are revolutionizing in ICU medication management, enabling CP to deliver patient-centred care. Expanded integration of pharmacy services and technology-enabled medication optimization are essential to further improve outcomes in critical care practice.

**Key words:** artificial intelligence, drug related problems, clinical pharmacists, intensive care unit.