

【Symposium 12-2】

AI's Guardianship: Against the Journey of AKI to Terminal Kidney Disease

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Acute kidney injury (AKI) represents a critical turning point in renal health, often setting the stage for long-term complications, including chronic kidney disease (CKD) and eventual progression to end-stage kidney disease (ESKD). Despite advances in nephrology, there remain significant unmet needs in identifying, predicting, and mitigating the downstream effects of AKI. Artificial intelligence (AI) has emerged as a transformative tool in addressing these challenges, offering novel approaches to early detection, risk stratification, and recovery prediction.

This presentation will dive into the long-term implications of AKI on renal health, emphasizing the gaps in current clinical practice and the potential for AI integration. Current AI research in AKI prediction and management will be discussed, highlighting the development of predictive models for AKI occurrence, dialysis recovery, and long-term renal outcomes. The limitations of AI, such as data quality, model generalizability, and ethical concerns, will be critically examined.

We will share insights from the AI implementation journey at Taichung Veterans General Hospital, including the development of an automated AKI labeling system, prediction tools for AKI onset and dialysis recovery, and real-world applications of AI models in clinical workflows. The challenges and successes of translating AI models from research to clinical practice will provide a framework for understanding the feasibility and impact of such innovations.

Looking ahead, this presentation will outline future directions for AI in AKI management, including the integration of multimodal data, real-time decision support systems, and personalized interventions. By leveraging AI's potential, we aim to transform the landscape of AKI care, bridging the gap between acute injury and sustainable recovery, ultimately preventing progression to terminal kidney disease.

