

## 重大災難與韌性醫療下的安寧療護

在重大災難情境下，醫療體系常面臨資源極度匱乏、病人暴增與照護環境受限的挑戰。韌性醫療 ( Resilient Healthcare ) 強調系統在壓力下的持續運作能力，透過及時反應、持續監測、預測風險與持續學習，維持核心服務。安寧療護在災難醫療中不僅是末期病人的照護選項，更是倫理決策與資源分配的重要一環，能減輕病患痛苦、維持尊嚴，並讓重症醫療團隊得以聚焦於可逆病況的搶救工作。針對重症醫師，災難下的安寧療護需快速辨識病人預後、啟動多專業團隊、整合臨終溝通與症狀緩解方案，並在資源不足時依循危機標準 ( Crisis Standards of Care ) 進行決策。此外，遠距照護與創新科技可在隔離、交通中斷或醫療能量分散時，確保安寧服務持續。重症醫師在災難應變中若能將安寧療護納入韌性醫療架構，不僅提升病人與家屬的照護體驗，也強化醫療團隊的長期承受力與系統適應力。

## 重症患者維生設備撤除經驗分享

重症患者在病情無法逆轉時，撤除維生設備需以病人尊嚴與家屬意願為核心。分享團隊經驗：先透過跨專業討論評估病情與治療效益，並與家屬充分溝通病程、可能症狀與舒適照護計畫。撤除過程重視疼痛與焦慮緩解，包含鎮靜、止痛與呼吸支持轉換，並持續陪伴與心理支持，確保患者安寧善終並減輕家屬的身心壓力。

## 醫療體制下的善終難題與溝通解方

在現行醫療體制下，善終常受急救導向、家屬期望與法律責任影響，導致過度醫療與延長痛苦。建立預立醫療決定 ( AD )、安寧療護觀念與跨專業團隊協作，是解方關鍵。透過早期病情說明、價值澄清及共同決策，並運用溝通技巧與同理心，協助家屬理解病程與尊重病人意願，可減少無效醫療、促進尊嚴善終，達成醫療倫理與人本關懷的平衡。

## 病人自主與器官捐贈之挑戰及案例分享

病人自主與器官捐贈常面臨價值衝突、家屬意見分歧與法律倫理挑戰。需強化預立醫療決定、器官捐贈意願登錄與跨專業團隊協作。透過完整病情說明、同理溝通與生命教育，協助家屬理解並尊重病人意願。案例分享顯示，早期建立信任、明確紀錄及倫理支持，可減少臨終爭議，促進器官捐贈的落實，實現尊嚴善終與生命延續的價值。

## PICC 3CG in Taiwan- the Pioneer" s Experience Sharing

台灣率先導入 PICC 3CG 技術，透過心電圖導引即時確認導管尖端位置，提升置管精準度並減少 X 光依賴與併發症。先驅經驗分享顯示，跨專業團隊培訓與標準化流程是成功關鍵，能縮短操作時間並提高一次成功率。此創新模式兼顧病人安全、效率與舒適，為長期輸液及重症患者提供更優質的血管通路選擇，展現台灣在先進血管治療領域的臨床實踐與發展潛力。

## IMPACT: A Critical Evaluation of Healthcare's Generative AI Responses

Consensus development involved expert panels, structured surveys, and pilot training courses for evaluators. The quality of evaluation items was optimized through iterative refinement and intraclass correlation (ICC) testing to ensure intra-rater reliability. Importantly, GAI was employed not only as the subject of evaluation but also as a supportive tool to enhance scoring consistency and generate explanatory feedback. Preliminary findings demonstrate the framework' s feasibility, high reliability, and potential to standardize assessment across diverse clinical and educational contexts. By combining structured consensus, validated scoring design, and advanced reliability testing, the IMPACT-HGAI framework offers a robust methodology for critically appraising GAI in healthcare. Its adoption can guide safe integration, improve transparency, and foster responsible use of AI technologies in patient care, research, and medical training.

## Early warning for clinical deterioration of patients outside the ICU

Clinical deterioration in general wards remains a critical concern in hospital care, accounting for up to 40% of in-hospital cardiac arrests with lower survival rates than those occurring in intensive care units. Clinical deteriorations are frequently preceded by recognizable hemodynamic instability and physiological changes that, if detected early, could allow for timely interventions potentially preventing 20-60% of such cases. Traditional

early warning systems such as Modified Early Warning Score (MEWS) and National Early Warning Score (NEWS) have been widely implemented but demonstrate considerable limitations in sensitivity and specificity, often leaving insufficient time for meaningful clinical intervention once an alert is generated.

This research has explored the current approaches to detect early clinical deterioration demonstrated the potential of deep learning models to improve early recognition of clinical decline in general ward patients.

### **Digital Transformation in Critical Care: Team Building & Quality Improvement**

Critical care medicine is facing escalating challenges, including increasing disease complexity, rapid medical innovation, and severe workforce shortages. These pressures call for innovative approaches that improve efficiency while sustaining high-quality, patient-centered care.

Digital transformation and artificial intelligence (AI) are reshaping intensive care by excelling in structured cognitive tasks such as image interpretation, infection detection, and automated monitoring. Examples include AI-driven prehospital STEMI detection, precision antimicrobial stewardship, guidance for acute respiratory distress syndrome recognition, remote home hemodialysis, and robotics. Collectively, these innovations support diagnosis, monitoring, clinician–patient communication, education, and administrative workflows—ultimately reducing clinical burden and enabling physicians to concentrate on complex decision-making.

This presentation highlights how digital transformation can foster multidisciplinary team building and continuous quality improvement, effectively translating AI from concept to clinical reality. It also addresses the evolving role of healthcare professionals, emphasizing human–AI cooperation as the foundation for the future of critical care.

### **Experience of polymyxin B hemoperfusion for severe sepsis**

Advancements in perioperative management and techniques have significantly increased the prevalence of high-complexity surgical procedures. Consequently, the incidence of severe perioperative complications is on the rise. Of these, intra-abdominal complications are commonly encountered, with Gram-negative bacteria being recognized as the most frequent causative pathogens. For septic shock resulting from intra-abdominal infections, reported mortality rates range as 28-48%. Particularly, the unstable physiologic status immediately after surgery and the disruption of host barriers due to surgical interventions, make the translocation of intra-abdominal pathogens into the systemic circulation more likely. This risk is further exacerbated by postoperative fluid losses and a pronounced systemic inflammatory response, significantly increasing the likelihood of progression to clinical deterioration, even multi-organ failure. This lecture aims to share my clinical experience with PMX-HP and AN-69 Oxiris therapy, and discuss specific criteria and key considerations for selecting appropriate blood purification strategy based on the clinical characteristics of patients.

### **Application of Nomogram Prediction Models in Clinical Medicine: The Respiratory Therapy Domain**

在臨床醫學中，準確預測病人是否能成功脫離呼吸器，對於提升照護品質與病人預後具有重要意義。特別是在臺灣的亞急性呼吸照護病房 ( Respiratory Care Center, RCC )，主要收治自加護病房脫離困難的病人，即所謂長期

機械通氣 ( Prolonged Mechanical Ventilation, PMV ) 個案。此階段是病人能否脫離呼吸器的關鍵時期，若無法成功脫離，將增加呼吸器相關併發症、死亡率以及住院成本，對病人家庭與醫療體系造成重大負擔。

### 研究目的 ( Objectives )

本研究目的主要開發及驗證一個簡單易用的諾莫圖，來預測病人呼吸器脫離失敗的風險，並與脫離呼吸器常用指標 RSBI 及 MIP 進行準確性比較，以協助醫師輔助臨床決策。

### Application of Smart Medicine in Predicting Ventilator Weaning

隨著智慧醫療的快速發展，電子病歷 ( Electronic Medical Records, EMRs ) 已成為臨床決策支持與醫學研究不可或缺的關鍵工具。透過整合與即時存取病患資訊，電子病歷系統不僅提升了臨床作業效率，也為醫療數據分析與人工智慧應用奠定了堅實基礎。

本次分享將介紹高雄醫學大學附設中和紀念醫院於呼吸治療領域建置與應用的電子病歷系統，並探討其在預測呼吸器脫離時機中的應用實例。我們蒐集重症加護病房病患的生理參數與實驗室檢查數據，進行統計與機器學習分析，以協助臨床醫師更準確地判斷脫離時機，期望降低脫離失敗所導致的併發症風險，並有效提升醫療資源使用效率。

### Unlocking Evidence: Opening Doors to Integrate Real-World Evidence into the Treatment of CRE and CRPA Infections

破青黴素類抗生素抗藥性腸桿菌 ( CRE ) 與綠膿桿菌 ( CRPA ) 感染治療面臨抗藥性與臨床數據不足挑戰。整合真實世界證據 ( RWE ) 可補足臨床試驗限制，提供實際病況下的療效與安全性資訊。透過多中心資料庫、感染監測與大數據分析，協助精準選擇抗生素及治療策略。分享最新國際與本地研究經驗，說明如何將 RWE 納入指引與臨床決策，優化抗藥性治療並提升病人預後與感染控制效能。

### 重大災難照護可能面臨之倫理困境

重大災難照護常面臨倫理困境，包括有限醫療資源分配、優先救治決策、病人自主權與知情同意受限、危險環境下醫護人員安全與責任平衡，以及死亡判定與撤除治療的道德拉鋸。需建立倫理指引與跨專業溝通機制，以兼顧公平、尊重與最大公共利益。

### 醫療人員該如何面對重大災難照護-心理壓力與道德困境?

當面對重大災難情境時，醫療人員往往承受巨大的心理壓力與道德困境。本演講將探討災難現場中常見的心理反應與創傷反應，並說明如何提供實務上的心理支持與危機介入。期望可協助醫療人員在災難現場中更具備心理韌性與倫理判斷能力，為病患與社會提供更周全的照護。

### The Application of AI in ICU: Now and Future

Artificial intelligence (AI) is transforming intensive care units (ICUs) through real-time monitoring, early risk prediction, and clinical decision support. Current applications include sepsis detection, respiratory failure alerts, and optimized resource allocation, reducing errors and improving outcomes. Future directions integrate multimodal data, precision medicine, and automated care to enable personalized treatment and intelligent ICU management. Challenges remain in data privacy, algorithm transparency, and clinical validation. Ongoing interdisciplinary collaboration is essential to ensure safe, effective, and ethical AI deployment in critical care.

## **My Journey in ARDS Research**

This presentation shares my research journey in acute respiratory distress syndrome (ARDS), from exploring pathophysiology and biomarkers to advancing precision treatment strategies. Key studies include early detection methods, innovative ventilation approaches, and translational research bridging bench to bedside. Through multidisciplinary collaboration and real-world clinical trials, our work aims to improve survival, reduce complications, and personalize therapy for diverse patient populations. Lessons learned highlight the importance of integrating basic science with clinical insights to drive continuous innovation in ARDS management and critical care.

## **Suggestions for the Intensive Care Staffing Shortage**

The current shortage of intensive care unit (ICU) personnel in Korea represents an urgent healthcare crisis exacerbated by recent healthcare policy changes and subsequent resignation of medical residents. This presents a systematic framework of short-term and long-term solutions to address this critical issue. Short-term interventions include enhancing financial incentives for ICU specialists through restructured compensation systems and improved medical fee structures; systematizing Physician Assistant (PA) programs through standardized training curricula, certification processes, and legislative amendments to clarify their legal status; and improving ICU work environments through workload management systems and burnout prevention programs. Long-term strategies focus on expanding critical care specialist training through extended fellowship programs and subspecialty certification; implementing Tele-communication systems to support underserved areas through remote monitoring and inter-hospital consultation networks; and optimizing ICU operations through standardized admission/discharge criteria and enhanced information systems. The Korean Society of Critical Care Medicine emphasizes its commitment to supporting these initiatives through updated clinical guidelines, quality management programs, and realistic staffing standards for healthcare institution evaluation. This comprehensive approach acknowledges that the ICU personnel shortage threatens national health security beyond the medical community and requires collaborative efforts between healthcare professionals, institutions, and government agencies to build a sustainable critical care system for the future.

## **Precision Medicine in ARDS: Today and Tomorrow**

Precision medicine in acute respiratory distress syndrome (ARDS) focuses on identifying biological subphenotypes, genetic markers, and individualized responses to optimize therapy. Current strategies integrate biomarkers, imaging, and clinical data to guide ventilation, fluid management, and pharmacologic interventions. Emerging approaches, including multi-omics analysis, AI-driven prediction, and targeted therapies, promise more personalized care. Future directions emphasize early diagnosis, dynamic risk stratification, and adaptive treatments to improve outcomes and reduce heterogeneity. Continuous collaboration across disciplines is essential to translate precision medicine advances into routine ARDS management.

## **Blood purification- Premise, Promise in Sepsis and Beyond**

Blood purification offers a promising adjunctive therapy for sepsis and critical illness by removing endotoxins, cytokines, and other harmful mediators. Current modalities include hemoadsorption, high-volume hemofiltration, and plasma exchange, aiming to modulate dysregulated inflammation and support organ function. Clinical evidence shows potential benefits in selected patients, though optimal timing, indications, and outcome impact remain under investigation. Future perspectives focus on precision patient selection, biomarker-guided therapy, and integration with conventional treatments to enhance survival and expand applications beyond sepsis to other critical conditions.

## Forward Resuscitative Surgical Team

前進救護外科小組 ( Forward Resuscitative Surgical Team, FRST ) 專為戰地與重大災難情境設計，能於前線快速建立手術與急救能力。其核心任務為早期止血、搶救生命危急傷患與穩定傷勢，以利後送。團隊由外科、麻醉、護理及後勤組成，採輕量化裝備與機動部署，縮短黃金搶救時間。結合標準化訓練與跨專業協作，FRST 有效提升重大外傷存活率，並可延伸應用於自然災害與大型事故的緊急醫療支援。

## Non Invasive Neuro Monitoring and the Management

非侵入性腦部監測技術可即時評估腦血流、腦氧合與顱內壓變化，包含近紅外線光譜 ( NIRS )、經顱都卜勒超音波與腦電圖等。應用於重症與神經加護，可早期偵測腦缺血、顱壓升高及癲癇活動，指引鎮靜、通氣與血流動力治療。此方法降低侵入風險與感染率，並提升監測連續性與病人安全。結合多模態資料與人工智慧分析，未來可更精準地協助腦傷、腦中風及術後神經照護的即時決策與治療優化。

## Traumatic Induced Coagulopathy

外傷誘發凝血障礙 ( Traumatic Induced Coagulopathy, TIC ) 是嚴重外傷後早期出現的複雜凝血失衡，由失血、休克、組織因子釋放與發炎反應共同引起。其特徵包括出血難止、凝血因子耗竭與纖溶亢進，增加死亡與多器官衰竭風險。治療強調早期辨識與全程監測，結合搶救性輸血、凝血因子補充及目標導向治療。近年強調搶救「損傷控制復甦」策略與床邊凝血檢測，能有效改善出血控制與預後，降低併發症與死亡率。

## Advancement of Ischemic Stroke Care

缺血性腦中風照護近年快速進展，強調「黃金時間」內的即刻處置。靜脈溶栓與動脈取栓技術持續精進，治療時間窗從傳統的 4.5 小時延長至可選擇性 24 小時。影像評估與 AI 輔助提升病灶判讀與決策精準度。急性期後，早期復健與二級預防 ( 抗血小板、抗凝與危險因子控制 ) 同樣關鍵。多學科團隊與區域中風網絡的建立，使治療更快速系統化，顯著改善腦中風患者的功能恢復與生活品質。

## Seizure Code

癲癇急症 ( Seizure Code ) 是一套快速反應流程，用於院內出現持續或反覆抽搐的病人。目標在於縮短診斷與治療時間，降低腦損傷與死亡風險。流程包括即時啟動團隊、迅速評估氣道與生命徵象、建立靜脈通路並給予第一線止癲藥物，同步找出潛在病因如低血糖、中風或感染。透過標準化處置、跨專業合作與持續監測，可提升控制發作的成功率並減少併發症，確保病人安全與神經功能的最佳保護。

## Poor Grade Aneurysm, Is it Really Poor?

重度顱內動脈瘤出血 ( Poor Grade Aneurysm, WFNS IV-V ) 過去被視為預後不良，但近年研究顯示積極治療可改善結果。早期血管內栓塞或開顱夾閉結合嚴密神經加護，有助降低再出血與腦血管痙攣。嚴格控制顱內壓、維持腦灌注與多模式監測亦提升存活與功能恢復。選擇合適患者並建立跨專業團隊，可在降低失能與死亡率上取得進展，顯示並非所有重度動脈瘤都注定預後不良。