Symposium 8
韌性醫療中，毒性化學事故及解毒劑儲備現況座談
Resilient Emergency Care: Safeguarding Patients in Chemical incident

時間：2026 年 6 月 26 日(五) 13:30~15:00

會議室：402CD 會議廳

座長：毛彥喬醫師(台中榮總)、林志泉醫師(林口長庚醫院)

13:30~13:45 戰火下的醫療盾牌：現代 CBRNE 威脅與軍醫應變新架構

Medical Shield in Modern Warfare: New Framework for CBRNE Threats and Military Medical Response

主講人：何政軒醫師(三軍總醫院)

13:45~14:00 當技術災難來臨，EMS 如何應對？

CBRNe X EMS

主講人：王則堯醫師(台北榮總)

14:00~14:15 解毒劑儲備現況與韌性醫療之準備

The Resilient Preparedness and Stockpile of Antidotes for Toxicological Emergencies

主講人：鄧昭芳醫師(台北榮總)

14:15~14:30 Chemical Incidents Preparedness and Response

主講人：Dr. Steven Lim (新加坡樟宜綜合醫院)

14:30~15:30 座談

Panel Discussion

與談人：全體講師及官署代表

課程簡介

- **戰火下的醫療盾牌：現代 CBRNE 威脅與軍醫應變新架構**

本報告以軍醫觀點出發，摘要分析俄烏戰爭等現代衝突對醫療體系的挑戰。由於無人機飽和攻擊與後送受阻，傳統「金小時(Golden Hour)」救治模式可能失效，醫療設施因此需走向微型化與地下化。針對化學事件，亦須納入就地化學工廠遭武器化的情境。事件發生時，若在除汙前，或於熱區 / 暖區辨識出毒性症狀(如神經毒劑暴露)，解毒劑應同步儘早使用。除汙方面，PRISM 指南提出「三重協議(Triple Protocol)」：先以脫衣(可清除 85% 污染物)與緊急乾式除汙(預設使用吸收性材料，以避免「洗入效應(Wash-in Effect)」)進行初步處置；再透過梯管系統進行粗略除汙；最後施行專業的技術除汙。應變流程並依病患活動能力分為 C1(具活動力者)與 C3(無反應或重傷者)路徑。此外，「主動擦乾(Active Drying)」是移除殘留污染物的關鍵，並介紹 ASPIRE 決策工具，用於評估是否需要濕式除汙。

- **當技術災難來臨，EMS 如何應對？**

  技術災難(CBRNe 事件)對緊急醫療系統帶來高度複雜的應變挑戰，現有的標準作業流程往往難以直接套用。本講題將從實務角度出發，探討 CBRNe 現場應變的幾項重要概念，包括初步應變與專業應變的角色區分與銜接(Initial Operational Response, IOR vs. Specialist Operational Response, SOR)、初步除污策略的選擇(dry decontamination)、現場與大眾溝通的角色(risk communication)，以及在檢傷過程中如何兼顧即時的救命處置(life-saving intervention within triage)。這些面向彼此緊密相連，共同影響著 EMS 團隊在高壓、高風險環境下的決策品質與整體應變效能。透過回顧國內外文獻與實際案例，本講題希望提供與會者一個重新審視 CBRNe 應變框架的機會，思考在資源侷限的現實條件下，如何建立更具韌性與彈性的緊急醫療系統。

- **解毒劑儲備現況與韌性醫療之準備**

  In emergent setting, antidotes are essential in certain situations, it could mean life or death. Therefore, antidotes preparedness and stockpile are critical in medical facilities in response to the emergent medical needs. Antidotes can be categorized based on their working mechanisms, including toxic effect bypass, inert complex formation, accelerated detoxification, reduced toxic conversion, receptor site blockade, and receptor site competition. However, WHO often classifies antidotes based on the urgency of availability for toxicological emergencies, it is categorized into critical, emergency, and urgent classes to guide hospital stocking. In Taiwan, antidotes almost totally rely on the import from western countries. In 1997, we made a proposal of antidote preparedness and stockpile to the Ministry of Health (MH) based on the needs which we have faced in our daily practice of The National Poison Center operation. Since 2000, the MH has adapted our proposal and granted certain amount of funding to assist the starting and continuing operation of national antidotes preparedness, stockpile and supply network. The National antidotes supply network has been functioning quite well with the current available antidotes inventory. However, as the time goes by, the emerging drugs of abuse (e.g. Carfentanil), splashes of aggressive industrial chemicals (e.g. HF, TMAH), potential attacks of chemical weapons (e.g. VX series) and poisonings related to deadly exposures of natural toxins (e.g. Bangkrekic acid food poisoning) have brought new challenge for all of us in diagnosis making as well as the measures of emergency management which undoubtedly requires more efforts and resources to explore.

- **Chemical Incidents Preparedness and Response**

  Chemical incidents—ranging from large-scale industrial disasters to smaller hazardous material (HazMat) exposures—pose significant challenges to emergency preparedness and healthcare response systems. This talk presents a practical, systems-level approach to chemical incident readiness, with particular relevance to emergency departments and frontline responders.

  We will review the epidemiology of chemical incidents and highlight risk patterns associated with regional industrial activities. Core principles of hazard mitigation and preparedness will be discussed, including inter-agency coordination, infrastructure readiness, and workforce training.

  The session will also cover decision-support tools for triage and decontamination, enabling structured and timely responses during high-risk events. Commonly encountered toxic agents will be examined alongside their clinical presentations and evidence-based management, with emphasis on early recognition and critical interventions.

  By integrating operational, clinical, and public health perspectives, this talk aims to provide participants with a clear framework to strengthen preparedness, enhance response capabilities, and improve patient outcomes in chemical incidents.