Nature and Appropriateness of Medical Interventions Performed by Law Enforcement Officers (LEO) after Officer-Involved Shootings (OIS)–An Open-Source Video Analysis

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Introduction: Although LEOs frequently provide medical care to injured individuals, this care is more likely to be perceived by EMS as harmful compared with non-LEO emergency medical responders. Despite the rapid provision of LEO care after OIS, no mortality benefit has been demonstrated. The purpose of this study is to characterize the nature and appropriateness of care rendered by LEOs.
Methods: Retrospective analysis of open-source video footage of OIS occurring between January 1, 2023, and December 31, 2023. Only footage containing LEO medical care was included in the final cohort. Care provided, appropriateness of care, presence of cognitive errors, and mortality outcomes were evaluated. The study was deemed exempt by the Mayo Clinic Institutional Review Board.
Results: Of 347 videos, 87 were included in the final cohort. Time to LEO intervention was 170.2 ± 218.6 s; care was rendered in < 120 s in 59.2% of cases and > 300 s in 14.3%. Mortality was 55.3%. Torso trauma occurred in 58.6% of cases, while isolated extremity trauma occurred in 19.5%. Tourniquets were placed in 27/30 casualties and were not indicated in 18. One of three casualties who did not receive a tourniquet may have benefited from one. Chest seals were appropriate in 29 casualties and applied in 18. Hemostatic gauze was applied in 14 casualties; it appeared appropriate in 5 and was incorrectly applied in 6. CPR was performed in 25 casualties; 4 had signs of life and 4 received CPR from a standing position. Difficulty identifying medical supplies appropriate for the injury was noted in 11 videos. Cognitive compromise was noted in 14 videos.
Conclusion: Although care was rapidly rendered in the majority of cases, mortality remained high. Inappropriate or incorrectly applied medical interventions were commonly noted. Multiple opportunities to improve LEO medical care exist.

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Comparison Of Three Airway Equipment in Prehospital Care in Terms of Placement Time, Ease, and Effectiveness

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Introduction: Airway management, ventilation, and adequate oxygenation are an essential part of prehospital care. The easiest airway can be the most difficult airway for the inexperienced person, especially in disaster situations where more patients will need airway interventions. The combination of Guedel & BVM or perilaryngeal supraglottic airways (LMA) are two airway management techniques that are used in the field. However, effective ventilation with a combination of Guedel & BVM cannot be provided in inexperienced hands due to air leakage. Regarding LMA, there is a decisional dilemma regarding its use by inexperienced providers in prehospital settings. Therefore, new airway equipment providing both airway control & ventilation is needed for prehospital airway control and ventilation. There is new supraglottic airway equipment, guedel-type cuffed oropharyngeal airway (Tulip airway), which can provide both airway control and ventilation support. The study compares Guedel & BVM, LMA, and Tulip airway on prehospital use for airway management.
Methods: The study group included military first aid school students. They used Guedel & BVM, Tulip airway, and LMA on the manikin-based simulator. Ventilation adequacy was assessed visually by inflating the balloon that stimulated the lung. Time from insertion to achieved ventilation, instructor intervention, and maneuver requirement were recorded.
Results: The median time from Insertion to achieved ventilation of Tulip airway on manikin was shorter than Guedel & BVM and LMA. Tulip airway requires less instructor intervention and maneuver requirements.
Conclusion: If we grade them from basic to advanced, Tulip airway combines Guedel & BVM and LMA. Although the Tulip airway is simpler than LMA, it is as effective as LMA. As providing ventilation with the simplest airway device is important in disaster situations, Tulip airway, as a guedel-type cuffed oropharyngeal airway, can be evaluated for disaster medical care guidelines.

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Development of Drone Integrated Artificial Intelligence Based Mass Casualty Triage Decision Support System (DIABMaCTDeS)

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Introduction: Triage and casualty evacuation are two essential components of the medical management of mass casualty incidents. However, there is a notable lack of scientific evidence supporting the validity of mass casualty triage protocols. This study aims to develop a 'Drone Integrated, Artificial Intelligence-Based Mass Casualty Triage Decision Support System' (DIABMaCTDeS) to assist on-scene response teams

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in making triage decisions and to enhance data transfer from the incident site to emergency management centers.
Methods: The development of the system occurred in four phases: (i) respiratory rate, pulse, oxygen saturation and body temperature detection algorithms were created by utilizing image processing techniques applied to drone captured footage; (ii) Drone Integrated Mass Casualty Triage Algorithm (DIMaCTA) was developed using the Delphi method; (iii) an artificial intelligence-based decision support system was built upon the DIMaCTA algorithm; (iv) a user application was developed to facilitate real-time data transfer between field teams and emergency management centers.
Results: According to the preliminary results, the accuracy rate of the pulse, respiration, oxygen saturation, and body temperature detection algorithms varied between 95% and 99%. In the Delphi study, the interquartile range for expert opinions on decision points and scoring criteria was determined to be 1.2, and the total percentage of those who answered "partially agree" and "strongly agree" regarding the structure of the algorithm was 70% or above. These results show that a consensus was reached on the parameters and decision points in the algorithm.
Conclusion: The drone-integrated system enables faster scene access than ground teams, providing data on scene security, victim location, vital signs, and triage priorities. It allows the most urgent cases to be identified and evacuated quickly and safely. The system will significantly aid in the rapid assessment of casualties and data transfer to emergency management centers, both in urban and hard-to-access remote areas, especially where responder safety is uncertain.

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Enhancing Operational Efficiency in Multi-Functional Aero-Support Agencies: Insights from the Government Flying Service Emergency Response Operations

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Introduction: The Government Flying Service (GFS) plays a crucial role in Hong Kong's emergency response system as the exclusive aero-support agency. Its responsibilities include medical evacuation, in- and off-shore search and rescue, fire-fighting, underslung load operations, and various other tasks. As a versatile and multi-functional entity, these responsibilities also introduce significant challenges for operational managers and coordinators in planning and resource management during incidents. A survey was designed to investigate the challenges faced and the vital information required during complex emergency operations management.
Methods: An anonymous questionnaire was designed and distributed to 16 operation managers and 24 coordinators. They were asked to rate the challenges they faced in managing complicated emergency response operations and the vital information required to support their decision-making and operational coordination. Each listed item was scored on a 10-point Likert scale, with points labeled as "Least challenging" (1) and "Most challenging" (10), as well as "Least important" (1) and "Most important" (10), respectively.
Results: Among the 28 (70%) respondents, 11 are operation managers, and 17 are coordinators. For managers, the most challenging condition is "Discrepancies between reported information from the tasking agency and the real situation" (mean = 7.73); the most important information is "Aircrew availability" (mean = 8.18). For coordinators, the most challenging condition is "Multiple active communications (phone, radio, fax, colleague)" (mean = 8.06); the most important information is "Casualty condition (for Search and Rescue, Medevac)" (mean = 7.71).
Conclusion: By analyzing survey data on the critical issues encountered and essential information needed during complex emergency scenarios, this study seeks to provide valuable insights for enhancing operational efficiency and decision-making processes within multi-functional aero-support agencies. The findings have the potential to drive improvements in operational management practices and inform future training strategies for managers and coordinators in similar contexts.

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Factors Contributing to Pre-Hospital Care Delays in Trauma-Related Mass Casualty Incidents: An International Survey for Pre-Hospital Clinicians

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Introduction: Mass-casualty incidents (MCIs) have increased globally over the last two decades, both in number and magnitude. Preventable on-scene mortality in MCIs may result from delays in pre-hospital time (PHT). This study aimed to identify factors contributing to PHT delays and explore pre-hospital care providers' (PHCPs) suggestions to optimize PHT.
Methods: A cross-sectional, global online survey was conducted between May and August 2024. PHCPs with experience in at least one MCI were invited via professional associations and social media. Data was collected via a validated questionnaire, including Likert-scale statements to measure agreement levels, multiple-choice, and open-ended questions. Queen Mary Research Ethics Committee (DSREC_01_v2_F_Alruqi) approved.
Results: There were 225 participants from 54 countries. Of these, 29.78% were from low- and middle-income countries (LMICs), and 70.22% were from high-income countries (HICs). Most participants were paramedics (62.22%), followed by physicians (16.44%), EMTs (7.56%), nurses (5.33%), others (4.89%), and first responders (3.56%). The median number of MCIs experienced was 5 (IQR 3 – 14); HIC: 5 (IQR 3 – 10); LMIC: 10 (IQR 5 – 20). The majority of respondents cited poor communication (84%) and geographical challenges (80%) as primary factors associated with extended PHTs. LMICs reported that equipment inadequacy and hospital

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