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CONFERENCE ABSTRACTS

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Military and emergency pharmacy

Coordination of pharmaceutical support in disaster-affected areas with increased regional imbalance of pharmacists in Japan

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Introduction: The 2024 Noto Peninsula Earthquake was a massive earthquake of magnitude 7.6 that occurred on the Noto Peninsula of Japan on New Year's Day 2024. The areas that suffered extensive damage became isolated due to the collapse of the transportation network, and people in need of medical care were unable to access it. There were delays in the improvement of the environment in hospitals, social welfare facilities and evacuation shelters, and it resulted in difficulties in providing support to the evacuees. In addition, because of the disaster occurred in regions where the proportion of the people over 65 years old exceeds 50%, it is thought that the essential issues were not only the number of preventable deaths, but also the reduction of unnecessary tragedies, and the difficulty of setting recovery milestones.

Purpose: To provide pharmaceutical support from multiple perspectives in disaster-affected areas to minimize medication delays for disaster evacuees.

Methods: As a member of the pharmaceutical support team of the Disaster Medical Assistance Team of the Health, Medical Services and Welfare Coordination Headquarters of the affected local government, we were involved in issuing emergency disaster prescriptions, coordinating the dispatch of mobile pharmacies, supporting pharmacists at medical institutions in the disaster-affected area, concluding disaster support agreements with, and requesting the supply of pharmaceuticals to administrative organizations.

Results: A local government in the disaster-affected area requested the Japan Pharmaceutical Association to dispatch mobile pharmacies and a total of 13 units were operated. In particular, in areas where there were no pharmacies to begin with, mobile pharmacies were very useful as places to dispense medicines prescribed by medical support teams, and they continued to operate in these areas for 63 days. In the northern part of the peninsula, which was severely affected by the disaster, the number of disaster emergency prescriptions dispensed by mobile pharmacies decreased following a peak about two weeks after the earthquake. A total of these prescriptions handled by pharmacies and mobile pharmacies in these areas exceeded 2,000 in the two months following the disaster. A cumulative total of 572 people were involved in the disaster support activities at 11 medical institutions or operated in the local government office. There was a medical institution where the activities of hospital pharmacists providing disaster support continued for more than two months.

Conclusion: In order to coordinate the activities mentioned above, it is necessary both to liaise with the government and medical organizations beforehand and to conduct training for pharmaceutical supports, as well as to have a system in place that allows for swift coordination in times of emergency. In

particular, disaster relief in areas with problems such as an increasingly aging population and an increased regional imbalance of pharmacists are difficult, and it was thought that how much preparation had been done in the normal times is essential. The results of our coordination of pharmaceutical support should be carefully examined so that it can contribute to future emergency support activities.

Review of an Emergency Medical Team (EMT) Type 2 Medicine Cache

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Background information: The workplace designs and manages an EMT Type 2 medicine cache worth approximately $230,000 for use within a rapidly deployable self-sufficient EMT 2 field hospital. EMT's must follow minimum standards published by the World Health Organisation (1).

Purpose: To outline the steps taken to update the medicine cache to the reflect the latest minimum standards whilst ensuring the kit is light, agile, cost efficient and reflects contemporary best practice.

Method: The pharmacy team reviewed all current published EMT minimum standard recommendations, reviewed contemporary practices, looked at availability of recommended stock and costing and made suggestions on changes to medicines. These changes were tabled at the specialty specific Technical Working Group (TWG) for discussion with final approval by our Medical Advisor.
Rules:
•No increase in space required (if an antibiotic is added, remove another antibiotic).
•Address gaps in recommended therapies as highlighted in the recent minimum standards
•Medicines available in our likely deploying region (Pacific region)
•Medicines listed on WHO Essential Medicine List.
•Minimise medicines requiring refrigeration or classification as a dangerous good. Use an alternative if possible.
•Further work around treatment assumptions to justify stock numbers, a pharmacist engaged in each TWG.
•Review appropriateness of medicine packs
•Review size of packaging from a WHS and sustainability point of view

Results: Major changes as a result of this process:
Pushing medicines out to treatment areas through the use of additional imprest cases. This decreases the reliance of attending the pharmacy for medicines and allow treatment to begin promptly as there is only one pharmacist on deployment.
Specific resuscitation "kits" in small trays replaced a general treatment bag for use in emergencies within the field hospital. These were able to be mounted inside the door of the locked medicine cases, giving a set location, improving security and decreasing unnecessary medicines.
Changing the imprest cases to half the size of the previous cases. The old cases were flagged as a safety risk and also unsuitable for commercial flight as they weighed up to 50kg. Now all cases weigh less than 30kg.
Physical reference books decreased from 17 to 6 books. Reference books have transitioned to electronic copies, majority available without requiring internet connection. This has allowed transition to a lighter desk set up.
Rationalising medicines to more convenient formulations, for example changing from an injectable medicine to a transdermal version and changing from a 4 times daily medicine to a once daily medicine in a bid to save nursing time and need for consumables.
Reviewing all medicines categorised as a Dangerous Good for air transport and replacing with alternatives to simplify processes.
Adoption of an electronic medicines management system, mSupply, improving inventory control and electronic dispensing.

Conclusion: Large changes were made to the EMT medicine cache improving the appropriateness of medicines, accessibility of medicines in the field hospital, handling of medicine boxes and transport of the cache.

Development and use of an automated electronic vaccination database for a volunteer deployable workforce

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Background: The workplace maintains a database of approximately 600 team members (TM) for an Emergency Medical Team (EMT) responding to Sudden Onset Disasters (SOD). Deployments occur at very short notice; hence, the workplace needs to ensure all selected TM are appropriately immunised against recommended diseases.

Purpose: To explain the custom electronic program used to monitor immunisation readiness of a deployable workforce and its use within a deployment.

Method: The workplace maintains a Workforce and Deployment Management System WDMS to collate information of potential EMT TM (i.e. professional qualifications, next of kin, etc.). To ensure all TM are correctly immunised for deployment, a vaccine recording and monitoring system was built into the WDMS.

A master list of vaccine rules outlining the accepted dosing ranges, booster recommendations, length of coverage and whether serology can be used as immunisation evidence, is maintained.
Volunteers send their evidence of vaccinations to the pharmacy team, a technician uploads and a pharmacist verifies.
The record is then automatically compared to the vaccine rules and coverage is updated.
Vaccination records are displayed in a traffic light system (green= up to date, orange=expiring, booster dose/serology required, red= not up to date).
When a deployment board is created, immunisation requirements can be set for the location. As each TM is added, those with outstanding immunisations are flagged. The pharmacist contacts those TM with outstanding immunisation requirements as TM are unable to be deployed without the required immunisations.

Results: Prior to a recent deployment, 207 TM were added to the deployment board as provisional deployees for a SOD, with 105 (51%) having the required immunisations. The two pharmacists sent 159 emails, made over 40 phone calls to the 102 TM with incomplete immunisation records. As a result of this, 68 TM received a total of 120 “just in time” vaccines within 3 days of contact. 6 TM supplied further information showing on the WDMS that their immunisation status was complete. In total, 137 additional vaccine records were uploaded and verified within the WDMS relating to this SOD.
One week after the deployment board was created, 86% of provisional deployees were compliant with required immunisations for the deployment.

Conclusion: Although only 30 fully immunised TM were deployed, approximately half of provisional TM required prompting for booster doses. Although TM are encouraged to proactively maintain their immunisations, many “just in time” vaccines were administered, which is very resource intensive. The electronic vaccine monitoring system, relies on TM submitting records and organising their own booster doses. Areas for improvement identified after this deployment included: updating the deployment board to further identify required vaccines; sending automated email alerts for booster vaccines; and investigating funding models to improve booster vaccine uptake.

Prospect of 3D printing technology in emergency pharmacy

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Background information: 3D printing technology is a process where physical parts are manufactured using computer-aided design, and objects are built on a layer-by-layer basis. Currently, 3D printing technology is utilized and being investigated in areas such as the medical, automotive, aerospace, and marine industries, as well as in industrial spare parts. In the medical area, the vast majority of marketed medical products with 3D printing technology belong to medical devices, such as orthopedics, prosthetics, tissue engineering, etc.; the number of marketed drugs is very small. U.S. Food and Drug Administration (FDA) approved the first 3D-printed drug in 2015, which provided ideas and references for the application of 3D printing technology in drug development and production. There are some advantages in 3D printing technology applied in the medical area, the development status of 3D printing technology in pharmacy and the future application prospect of emergency pharmacy are worth exploring.

Purpose: To explore the development status of 3D printing technology in pharmacy and the prospect of future applications in emergency pharmacy.

Method: A systematic literature search was conducted using the databases PubMed and Web of Science to include all relevant studies (3D printing technology, emergency pharmacy, etc.) investigating the development status of 3D printing technology in pharmacy and the future application prospect of emergency pharmacy.

Results: Compared to traditional pharmaceutical processes, there are some advantages in 3D printing technology, such as high forming speed, no waste of raw materials, high manufacturing precision, strong flexibility, devisable products, and on-demand manufacturing. 3D printing technology, as a technological evolution of revolution, has played a vital role in the optimization of drug delivery. 3D printing demonstrates significant advantages in pharmacy, including rapid prototyping, material efficiency, and precision in fabricating complex dosage forms. Emergency or drug shortage, flexible, rapid response and small batch production can be realized with 3D printing technology, which can relieve the pressure of clinically urgently needed drugs, and even can reduce the cost and number of defects by avoiding human-induced errors, and drive treatment towards an individual-centric instead of a population-centric, which provides possibilities for future applications of 3D printing technology in emergency pharmacy.

Conclusion: 3D printing technology holds the advantages of enabling agile, decentralized, and personalized drug production, making it possible that the patients can design the dosage needs as per their disease requirement, instead of relying directly on healthcare professionals, for example patients in remote villages, emergency environment, and disaster management areas, which can reduction in the shortage and wastage of medicines, ease of access to medicines and reduced dependency on trained medical professionals. Its capacity to manufacture tailored medications on-site could revolutionize disaster response and reduce global drug shortages, offering a viable pathway to enhance global health resilience. While there are still many issues with 3D printing technology that need to be discussed,

regulatory frameworks must evolve to address safety and scalability challenges, interdisciplinary collaboration among researchers, policymakers, and clinicians is critical to unlocking its full potential.

Expert consensus on emergency medicine supply for the national emergency and rescue medical alliance (NERMA)

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Background: As a critical component of healthcare emergency response systems, emergency medication supply has gained significant research attention in China. However, standardized guidelines or expert consensus remain lacking, with existing efforts primarily focused on basic medication catalogs while neglecting critical aspects such as vaccination protocols, nutritional support, and specialized medication storage/management in disaster scenarios. In October 2023, the National Emergency Medicine Research Center established the National Emergency and Rescue Medical Alliance (NERMA), uniting over 100 medical institutions. Against this backdrop, the formulation of this Expert Consensus on Emergency Medication Supply aims to systematically enhance NERMA's medical emergency response capabilities.

Purpose: This consensus seeks to establish standardized frameworks to:
(1) Develop scenario-specific medication catalogs aligned with disaster epidemiology patterns.
(2) Create standardized protocols for emergency medication information management.
(3) Design infrastructure-resilient supply strategies adaptable to critical service disruptions.
(4) Strengthen immunization protection protocols for rescue personnel.

Method: The consensus development followed three phases:
(1) Formation of a multidisciplinary expert panel comprising emergency medicine, pharmacology, disaster science, methodology, and related disciplines.
(2) Systematic evidence synthesis through comprehensive literature review.
(3) Iterative refinement via 2-3 rounds of Delphi method consultations to finalize recommendations.

Results: The consensus achieves four critical advancements:
(1)Disaster-specific medication catalogs (covering vaccines, nutritional supplements, and narcotic drug) tailored for fire, mining accidents, sandstorms, epidemics, and other emergencies.
(2)Standardized operational protocols for specialized medication management and pharmaceutical information archiving.
(3)Innovative contingency plans addressing critical infrastructure failures (e.g., water/power/network outages).
(4)Enhanced immunization safeguards for field rescue teams during operations.

Conclusion: This expert consensus advances the standardization of emergency medical supply systems. By establishing disaster-specific medication frameworks, operational protocols for specialized medication management, and resilient information storage mechanisms, it proactively bridges critical deficiencies in emergency preparedness frameworks. These measures collectively improve medical response efficiency while mitigating medication-related risks during rescue operations.

Exploring the psychological impact of delivering care in war zones: Approach to mental illness management for deploying soldiers

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Introduction: War zones are characterized by violence, destruction, and trauma. Rapid decision-making, and violence means that healthcare workers often face ethical dilemmas where there are no clear right or wrong choices. These situations can lead to long-term psychological trauma, contributing to feelings of alienation, hopelessness, a deep sense of moral disillusionment, and sometimes burnout.

Methodology: This is a desk based research, through literature reviews and interactions with known alternative-therapies practitioners.

Findings: The study found that psychological health conditions among military personnel in general can range from adjustment disorders, to post-traumatic stress disorders, depression, and anxiety. One study reported a 17.6% mental health prevalence in active duty service members who sought treatment between 2005 and 2022.

This is somewhat lower than the Center for Behavioral Health Statistics and Quality estimates (22.7%) for adults over the age of 17 years in the general population. Not many studies focus on psychological health studies on military healthcare workers.

It was also found that the right approach to mental illness management is key. Approach determines access and treatment successes. Different people may require different interventions like African herbs from traditional healers that may interact with known Western pharmacological therapies. Conventional interventions are not always preferred, hence alternatives are sort.

Conclusion: The psychological impact of delivering care in war zones is profound and multifaceted. The approach to offered-support should be diverse enough to cater for various individuals according to their upbringing, culture and preferences. These can be addressed by implementing comprehensive support structures that include mental health services, peer support systems, training, rest periods, organizational leadership, public recognition and alternative management therapies.

Establishing an Antimicrobial Stewardship (AMS) governance framework at the 34 Military Hospital: The role of global point prevalence survey data and behaviour change interventions

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Background: If current trends remain unchecked, antimicrobial resistance (AMR)-related deaths could reach 10 million annually by 2050, with significant economic consequences, particularly in low- and middle-income countries (LMICs). Hospital-based antimicrobial stewardship (AMS) programs improve patient outcomes and help mitigate AMR. However, such programs are either non-existent or ineffective in many LMICs. Sierra Leone reports high antimicrobial consumption with limited governance structures, such as AMS committees to oversee appropriate use.

A 2023 study at the 34 Military Hospital in Sierra Leone found antimicrobial consumption at 61.3 DDDs per 100 bed days, with most prescribed antibiotics classified under the WHO AWaRE WATCH category. These findings highlight the urgent need for antibiotic surveillance and the establishment of an AMS program in the hospital.

Purpose: To establish a multidisciplinary AMS committee with well-defined terms of reference (ToR) to lead AMS activities, develop a tailored AMS action plan, and secure hospital leadership commitment for its governance and implementation.
METHOD

The WHO AMS step-by-step guide was used to implement the project in phases. Following the planning and preparatory phase, a situational analysis and GPPS assessed existing AMS practices. Persuasive stakeholder engagement fostered collaboration and support. A multidisciplinary AMS Committee was formed based on social support and role modeling, ensuring members had the necessary attributes to drive AMS initiatives. Committee meetings established clear ToR and an action plan, incorporating specific, measurable, achievable, relevant, and time-bound (SMART) goals and reinforcement strategies to enhance implementation.

Results: Key strengths included national support, leadership commitment, and the presence of an AMS champion. Weaknesses included limited diagnostic services, high workloads, and knowledge gaps among healthcare workers. Opportunities were identified in partnerships and training programs, while threats included high AMR rates and low awareness.

The GPPS results showed a 71.4% antimicrobial prescribing prevalence, with a 75% patient documentation completion. The most prescribed antimicrobials were Ceftriaxone (27.7%), Metronidazole (26.6%), Amoxicillin (10.6%), Ampicillin (6.4%), and Ciprofloxacin (4.3%). Notably, no hospital-based treatment guidelines were available.

A ten-member AMS committee was formed, comprising a physician specialist, pharmacist, microbiologist, surgeon, laboratory scientist, infection prevention and control focal person, nurse, data clerk, quality improvement focal person, and public health expert. Using SWOT and GPPS insights, AMS was framed as a patient safety and quality improvement initiative aligned with hospital priorities, securing leadership endorsement. The hospital leadership formally signed and launched the AMS action plan and ToR. Challenges included limited AMS awareness, technical competency gaps in conducting SWOT and GPPS assessments, and low motivation for regular meetings.

Conclusion: This study demonstrates that establishing an AMS governance framework in a resource-limited setting is feasible. Key success factors include active stakeholder engagement, a multidisciplinary approach, and data-driven advocacy using behaviour change techniques. This framework can be a model for other healthcare institutions aiming to strengthen their AMS programme.

Business continuity plans in hospital pharmacies: A Delphi study

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Introduction: Ensuring the continuity of essential operations is a critical part of any organization's crisis preparedness. This can be achieved through Business Continuity Plans (BCPs). Although each BCP must be adapted to its local context and specific risks, there is a lack of documentation and guidance on their exact content for hospital pharmacies (HPs), in contrast to community pharmacies.

Purpose: To establish specific recommendations on BCPs in HPs using a Delphi expert consensus method.

Methods: A two-round Delphis study was conducted among an expert panel made up of hospital chief pharmacists, their deputy or their quality manager. They were recruited among Swiss civilian HPs, as well as among 2 civilian and 1 military HPs in each of the following country: Austria, Belgium, France, Germany, Italy. Recommendations were formulated by the investigators based on literature, interviews and their experience in disaster simulation exercises, and were illustrated by a series of practical examples for HPs. They were organized around the "4Rs" concept (risk reduction, readiness, response and recovery). A five-member steering committee validated, amended and corrected the recommendations before each round of voting. This committee was made up of a university hospital chief pharmacist, the Swiss Armed Forces chief pharmacist, the head of a hospital cybersecurity, the crisis and risk management advisor of a Swiss canton, and the head of the hospital prevention, safety and security department. The expert panel rated each recommendation on a scale from 1 to 9, with a target median of ≥ 7 for acceptance; the RAND/UCLA Appropriateness Method was used to determine consensus among recommendations. In the second round, recommendations without consensus among the experts in the first round, newly proposed recommendations, and recommendations validated in the first round but with comments requiring rephrasing were submitted. The results were the acceptance and the consensus of submitted recommendations defining the structure and content of BCPs in HPs.

Results: Of the 24 experts agreeing to participate, 18 responded in the first round (75% response rate), coming from Switzerland (78%), France (11%) and Belgium (11%). There was 56% female, 94% of civilian pharmacists, and 50% of chief pharmacists: only 17% had no BCP in their HP. Forty-one recommendations were submitted in the first round; 100% were considered validated (acceptance and consensus found among experts). Thirteen experts participated in the second round (72% response rate). Eleven recommendations were submitted, including 1 new proposal and 10 rephrased from the first round, for which the experts had to indicate their preference between the two versions. The new proposal was considered validated and all the 10 rephrased recommendations were preferred over their first version. The final list included 42 recommendations for establishing BCPs in HPs.

Conclusion: This set of consensus recommendations constitutes a practical guide tailored to civilian and military HPs, intended to help them develop and improve their BCPs to prepare for future crises threatening their critical activities.

The role of a military pharmacist in the World Motorsport Championships

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Background: Sepang International Circuit began operations in 1999 and has hosted numerous prestigious international motorsport events ever since, such as the Formula 1 and Moto GP World Championships. High-speed motorsports are associated with a heightened risk of injury, demanding the support of a reliable and well-coordinated medical team. Motorsport medicine shares notable operational similarities with military medicine, especially in the domain of trauma management and casualty evacuation.

Purpose: This study aims to explore and describe the role of military pharmacists in the medical logistics operations of international motorsport events.

Methods: This qualitative study employed a face-to-face interview approach to explore the experiences of pharmacists involved in medical logistics operations at Sepang International Circuit between 2011 and 2019. Four pharmacists who had directly participated in the circuit's medical team were purposively selected through criterion sampling, based on their active roles and firsthand exposure to medical logistics management during international motorsport events. Semi-structured interviews were conducted to gather in-depth insights into their roles in medical team during the championships. All interviews were audio-recorded, transcribed verbatim, and analysed thematically.

Results: Four important themes were emphasized through thematic content analysis including pharmaceutical management, team integration, logistical practices, and operational issues. The pharmacists' responsibilities

extended beyond pharmaceutical management to include oversight of consumable supplies, and maintenance of medical devices. In order to perform integration training for multidisciplinary medical staff with varying backgrounds and practices, pharmacists set up the necessary conditions and provide the necessary training materials. Essential logistic functions such as food and beverage distribution, communication device support, and fuel voucher management were also coordinated. Additionally, the pharmacist-led team addressed emergent operational needs, including evacuation of ill staff, rainwater management, pest control, and other circuit-specific logistical challenges.

Conclusion: The findings highlight the critical importance of medical logistics, with pharmacists serving as central figures in maintaining operational readiness and efficiency. Strong logistic support provided by pharmacists was essential to ensuring the delivery of effective, timely, and safe medical care within the fast-paced, high-risk environment of international motorsport events.

Safety considerations in treating botulism with equine-derived antitoxins

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Background: Botulism is a rare but severe paralytic illness caused by botulinum neurotoxins. These toxins interfere with the release of acetylcholine at presynaptic motor neurons leading to paralysis, autonomic dysfunction, respiratory depression, and death if left untreated. The mainstay of treatment is antitoxin therapy, with several formulations available in Europe: A fully equine-derived trivalent antitoxin (BioMed [Poland]), a licensed trivalent antitoxin (Behring [Germany]), and an unlicensed heptavalent antitoxin (Emergent BioSolutions). Both the trivalent antitoxin (Behring [Germany]) and heptavalent antitoxin (Emergent BioSolutions) are further de-speciated by removing the fragment crystallized (Fc) portion of the equine-derived immunoglobulin fragments, which reduces the risk of hypersensitivity reactions. However, adverse events such as anaphylaxis can still occur. Specific guidelines for managing adverse events related to equine-derived botulinum antitoxins and other safety considerations, such as concomitant drug therapy, are absent from published European guidelines.

Purpose: The objective of this work is to collate and summarize the range of strategies to mitigate adverse events associated with botulism treatment and the administration of equine-derived antitoxins. By doing so, this work seeks to inform pharmacists who may care for patients with botulism in the future and to enhance patient safety.

Method: A literature search was conducted across several databases, including PubMed, Embase, and Google Scholar, to identify retrospective reviews related to the occurrence of anaphylaxis, serum sickness, and pyrexia (a term suggestive of infusion reactions) associated with equine-derived botulinum antitoxins. The search also aimed to find clinical guidelines on managing these adverse events, and considerations for concomitant drug therapy. Findings were reviewed and summarized.

Results: This analysis included six (6) retrospective reviews documenting the incidence of anaphylaxis, serum sickness, and pyrexia related to equine-based botulinum antitoxins. Reported incidences in the literature were as follows: anaphylaxis (0.62%–3%), serum sickness (0.09%–5.5%), and pyrexia (1.8%–4%). Five (5) clinical guidelines on anaphylaxis and one (1) clinical guideline on infusion-related reactions were identified, but none specifically addressed the management of anaphylaxis or infusion reactions related to the administration of equine-derived botulinum antitoxins. No standardized treatment guidance was found for serum sickness. Epinephrine was consistently recommended as the first-line treatment for anaphylaxis, while antihistamines were suggested as premedication for infusion reactions. Six (6) medication classes (aminoglycosides, lincosamides, calcium and magnesium infusions, monoamine oxidase inhibitors, and neuromuscular blocking agents) were identified as agents that should be used with caution in the setting of botulism treatment due to the risk of exacerbating autonomic dysfunction.

Conclusion: The findings of this review demonstrate that equine-derived botulinum antitoxins carry risk for hypersensitivity reactions, and that certain concomitant medications administered during botulism treatment can exacerbate the patient's condition. Pharmacists need to be aware and prepared to manage potential adverse events associated with these antitoxins to improve safety and overall outcomes for patients being treated for botulism.

Strategies and challenges in valuing first-aid pharmaceuticals

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Introduction: One of the missions of emergency pharmacy is to setup a authorized pharmaceuticals list for reserve. Health technology assessment provide methods and models to value pharmaceuticals based on scenarios that all injuries could got adequate and specialized medical care. However, rescue personnel is limited, survival probability of seriously injured person continues to decrease while awaiting rescue. The pharmaceuticals which is cost-effectiveness for one injured person doesn't means cost-effectiveness for mass casualty. It

is necessary to construct a multi-criteria decision making strategy.

Purpose: To setup a comprehensive value assessment index system for first-aid pharmaceuticals based on multi-criteria decision making analysis, and conduct a case study. This system is designed to provide a structured and evidence-based approach to assist in the selection and prioritization of emergency drugs.

Methods: The development of the index system involved a combination of literature review and the Delphi expert consultation method, ensuring a robust foundation of evidence and expert consensus. The Analytic Hierarchy Process (AHP) was utilized to assign weights to the indicators, reflecting their relative importance in the evaluation process. The specific application scope and operational steps of the index system were clearly defined to ensure practical usability. To validate the system's feasibility and effectiveness, empirical research was conducted using real-world case studies.

Results: The final evaluation index system comprises 6 first-level indicators, 12 second-level indicators, and 17 third-level indicators. The first-level indicators include safety, efficacy, cost-effectiveness, suitability, accessibility, and innovation. Among these, efficacy, safety, and suitability were assigned the highest weights, at 0.2881, 0.2934, and 0.2222, respectively, reflecting their critical importance in emergency medication evaluation. The second-level indicators include drug efficacy, benefits for mass casualties, adverse drug reactions, scenario safety, cost effectiveness analysis, single treatment cost, technical applicability, scenario applicability, market accessibility, pharmaceutical supply chain, technical and application innovation, domestic and international patents. Third-level indicators include specific metrics like casualty rescue rate, contamination risk, and medication error risk. The application of the index system follows a structured six-step process: defining the research objective, selecting comparative drugs, collecting evidence-based data, scoring the indicators, calculating the total score, and drawing conclusions. Empirical studies were conducted on two pairs of medications: "Ceftriaxone for Injection/Sodium Chloride Injection (dual-chamber bag product) vs Ceftriaxone for Injection (vial product)" and "Salbutamol Orally Disintegrating Tablets vs Salbutamol Aerosol." These studies demonstrated the system's effectiveness and practical applicability in real-world scenarios.

Conclusion: The constructed index system addresses the critical need for a standardized and scientific approach to evaluating the value of on-site emergency medications. By incorporating multiple dimensions such as safety, efficacy, and suitability, the system provides a comprehensive framework for decision-making. It serves as a valuable auxiliary tool for the selection and prioritization of emergency drugs, ultimately contributing to more effective and efficient emergency response strategies. This system not only enhances the objectivity and transparency of emergency medication selection but also facilitates the integration of innovative pharmaceutical products and technologies into emergency care protocols.

Evaluation of the health information system in emergency medical response: Pharmaceutical management and BCP in field simulation

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Introduction: During emergency medical response, the utilization of a Health Information System (HIS) is essential for improving efficiency and ensuring patient safety. The Japanese Red Cross Society (JRCS) has developed the Total Medical & Biochemical Information System (TOMBI) as an HIS specifically designed for international emergency medical relief teams. In addition to standard HIS functions, TOMBI incorporates unique features such as an integrated pharmaceutical management system. This system was developed based on the experience of pharmacists engaged in international emergency medical relief activities, linking the prescription system with an inventory management database. Furthermore, TOMBI is designed for deployment in an international emergency medical environment, offering multilingual support, maintaining network connectivity via generators and ensuring robust security measures. It also includes Business Continuity Plan (BCP) to prepare for both temporary and critical system failures. Although TOMBI has undergone continuous improvement for over five years through various training sessions and field applications, it had not been comprehensively validated through a large-scale medical simulation exercise. In this instance, JRCS conducted a field hospital-scale medical simulation to verify TOMBI's performance, particularly in pharmaceutical inventory management and its alignment with the Emergency Medical Team (EMT) minimum standards, which require strict inventory control with data and paper-based documentation.

Purpose: The purpose of this study was to verify whether TOMBI, particularly in its pharmaceutical inventory and disbursement functions, performed effectively under field conditions simulated as a post-earthquake emergency response. Additionally, the study aimed to evaluate TOMBI's BCP through controlled system interruptions.

Method: A medical simulation exercise was conducted with approximately 40 patients, utilizing 15 tablet devices for TOMBI operations across different medical functions and a

laptop in the pharmacy for inventory management. During the simulation, TOMBI was intentionally shut down at one point to assess its BCP response. After the exercise, identified issues were analyzed and categorized by department.

Result: Overall, medical activities utilizing TOMBI proceeded smoothly because all users had received adequate training in advance. The pharmaceutical inventory management function operated without technical issues, automatically deducting dispensed amounts from stock. However, challenges emerged regarding pharmaceutical dispensing in emergency situations and the system's handling of partial-dose medications such as tablet splitting. Additionally, it was suggested that pharmacists having access rights to modify prescriptions upon a doctor's retrospective approval could facilitate smoother operations.

Conclusion: While TOMBI has primarily been developed through desktop-based design, real-world challenges were identified through this large-scale medical simulation exercise. Initially, TOMBI was intended to support all WHO Type 2 medical activities digitally. However, considering the need for operational speed and simplicity in the field, it is necessary to enhance TOMBI's usability and explore hybrid approaches that integrate digital and paper-based workflows. Moreover, the study underscored the importance of pharmacist oversight in prescription verification and inventory adjustments, contributing to enhanced safety and efficiency in emergency medical response.

Medicine kits for non-medical personnel

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Background: The Northern Territory (NT) is a geographically sparse region covering approximately 1.35 million square kilometres (17.5% of Australia's land mass) with a population of 245,000 people (less than 1% of Australia's total population)*. The climate of the NT differs according to region from central deserts to tropical savannah. The Top End region is subject to monsoonal rains, hence roads are regularly cut off, resulting in many areas relying purely on air-transportation for extended periods.

A specialist cell within the police force operates across the NT. They are used for extenuating circumstances, historically involved in high-risk incidents, remote search and rescue operations and dangerous training exercises and regularly operate outside of areas serviced by established medical services. For this reason, it was prudent for members of the team to have medic training and access to medications to provide life-saving treatment to its members and members of the public.

Purpose: This paper aims to describe the licensing process and governance of medicine packs for this police specialist cell.

Method: The identified medics from the specialist cell attend a week-long training course designed and run by emergency clinicians which incorporate lectures, training dummies and simulations. Police medics undergo initial training and annual reaccreditation to ensure ongoing competency.

Emergency medical procedures and medicine administration is taught and competency assessed. As the medics have not undergone a full paramedicine course, they are not licensed to carry medicines as health practitioners.

The NT has a system whereby people (non-health practitioners) living in remote areas can hold an Emergency Medical Kit (EMK). These are standardly issued to people living on cattle stations or posted to remote locations. In the event of an emergency, the EMK holder calls a doctor for advice, who then authorises medicine use if needed.

Results: The specialist police cell were able to be licensed to hold a custom EMK. Medicine protocols were adapted for the police medic with the condition that prior approval from a medical officer is obtained before use, unless there are extenuating circumstances.

A safe was placed within a secure location within police headquarters with access limited to police medics only. Kit use was monitored on a quarterly basis and assessed regarding appropriateness of use and any improvements.

Two different medicine kits were created; an individual medic medicine kit; and a larger search and rescue kit.

Kits contain:

-Adrenaline injections (plus needles and syringes) and an auto-injector

-Ibuprofen tablets

-Methoxyflurane whistle

-Ondansetron tablets

-Paracetamol tablets

Conclusion: Medicine kits were able to be issued to a group of non-medical people using an existing framework. This ensures appropriate life-saving medical care can be delivered while awaiting emergency services response and hospital transfer when needed.

Sustainable practices in the maintenance of an emergency medical team medicine cache

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Background information: The dilemma facing many warehouses of Emergency Medical Teams (EMT), especially those focussing on sudden onset disasters is that they must maintain a state of readiness with many expensive perishable items impacting the budget and the environment. The workplace holds a rapidly deployable self-sufficient EMT Type 2 field hospital; including a medicine cache valued at $175,000 AUD. The medicines from the cache are rotated through the affiliated local hospital pharmacy at one year prior to their expiry. Rotations are required to be completed regularly due to the short expiry dates of stock arriving from suppliers.

This process also allows the local hospital a buffer and surge supply if there are stock shortages.

Purpose: To demonstrate the cost savings and reduced wastage of medicines by completing regular rotations through the affiliated local hospital pharmacy department.

Method: Every month, the pharmacy technician runs a report of medicine items with less than one year expiry from the inventory stock control system. The expiry dates of these items are compared with that of the stock held in the local affiliated hospital pharmacy. All items with a longer expiry date are rotated as long as there is sufficient turnover to ensure its use before expiry. Automatic recording occurs of items rotated on a spreadsheet, items discarded and their costs are used as key performance indicators (KPI). The department regularly reviews practices to improve sustainability of the medicine cache and initiates changes.

Results: Over the 12 month period in 2024, $127,000 AUD worth of stock was rotated. This represents 334 different lines of medication and 73% of the total medicine cache value. $11,500 AUD worth of stock was discarded due to being expired over this time period, this represents 44 different lines of medication. The two main reasons for discarding stock were that the medicine was not stocked at the local hospital or was not used in a large enough quantity to allow rotation.

Other sustainable practices adopted by the workplace include:
•Reusable medicine storage with constant temperature monitoring so that medicines that are not heat affected can be reused after the deployment;
•Rationalisation of medicine numbers by examining previous deployment usage, country profiles and noting resupply options;
• Replacing medicines with lighter formulations to save on freight costs;
•Replacing multiple daily dose medicines with single daily dose medicines to decrease bulk; and
•Replacing medicines with a high environmental impact with other medicines for example, items requiring cold chain and dangerous goods.

Conclusion: Adopting sustainable practices improves budget outcomes. The workplace continues to look for further solutions to improve sustainability whilst maintaining quality of care.

Advancing global collaboration: Implementation of the virtual global symposium on the pandemic response and its impact on pharmacy education and practice

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Background information: During the COVID-19 pandemic, pharmacists worldwide took on expanded roles in testing, vaccination, telehealth, and public health. Recognizing the need for global collaboration and knowledge exchange in pharmacy education and practice, the Global Education Special Interest Group (GE SIG) of the American Association of Colleges of Pharmacy (AACP) organized the Annual Virtual Global Symposium starting in 2021. As global needs shifted, the focus of the symposium evolved from pandemic response to broader themes around emergency preparedness and longer-term impacts on the pharmacy profession and population health. The goal of this initiative was to facilitate discussions on best practices, lessons learned, and the evolving changes in global pharmacy education and practice.

Purpose: To describe the development, implementation, and lessons learned from the Virtual Global Symposium over three years (2021-2023).

Method: A task force of the GE SIG of AACP was established in 2021 to coordinate a virtual global symposium featuring pharmacy educators from diverse countries across all continents. To ensure consistency, speakers used a standardized presentation template and content prompts. The symposium included two live discussion panels (morning: 10.00am-12.00pm; evening: 7.00pm-9.00pm, United States Eastern Time) on the same day to accommodate global time zones. Each panel had at least 6 speakers and a moderator. To minimize technical challenges, 10-minute presentations were pre-recorded and replayed during the symposium. Presentations were followed by a live Q&A session. Promotion was conducted through organizational networks and speaker affiliations. In 2023, a new practitioner and a pharmacy student were added to each panel to broaden perspectives. Participant feedback was collected through post-symposium surveys to assess satisfaction and perceived value.

Results: From 2021 to 2023, three symposia were planned and delivered, each focused on patient care approaches as well as pharmacy practice and education while reflecting the changing global pharmacy landscape. The 2021 symposium focused on "Pandemic Response around the World" highlighting how different countries were navigating the developing pandemic. In 2022, the theme was changed to "Pandemic Response around the World: Lessons Learned & Preparedness for the Future." In 2023, the symposium theme shifted to "Post-Pandemic Changes in Global Pharmacy Education and Practice." Speakers from more than 10 countries, including Australia, Chile, Colombia, Croatia, Ghana, Malta, Mexico, Nigeria, South Korea, Thailand, and the United States, shared their perspectives. Participant survey responses collected from 2021 and 2023 showed that attendees found the symposium was beneficial to their practice, met stated objectives, and agreed that they would recommend it to colleagues. Participants highlighted the variety of perspectives, the notable differences in pharmacy practice globally, and the need for training in emergency preparedness and technology.

Conclusion: The Virtual Global Symposium successfully fostered a global dialogue on pharmacy education and practice during and after the COVID-19 pandemic. Findings suggest the need for ongoing global collaboration in emergency preparedness, public health education, and pharmacy curricular adaptations to meet the changing needs of society.

Ukrainian patients' perspectives on advanced pharmaceutical services provided by polish Pharmacists: A cross-border support initiative

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Background Information: Pharmacists play a crucial role in public health by offering diverse pharmaceutical services. With the outbreak of war in Ukraine, millions of Ukrainian refugees sought medical assistance in Poland. A cross-border support initiative was launched to address the medical needs of Ukrainian patients, ensuring access to essential medications and pharmaceutical consultations. Purpose: The study aimed to evaluate the perceptions of Ukrainian immigrant patients regarding the advanced pharmaceutical consultation services provided by Polish pharmacists.

Method: A survey was conducted in 2022 among 250 Ukrainian patients who had received pharmaceutical consultations in a city near the Polish-Ukrainian border. The pharmacists assisted refugees in finding equivalent medications, provided treatment for minor ailments, and educated patients on proper medicine use. The survey assessed patient satisfaction using a Likert scale.

Results: The results showed an overwhelmingly positive response, with nearly all respondents (≈95%) strongly agreeing that the pharmacists' services were valuable. The lowest agreement score was 90.4% for the statement, "If possible, I would like this kind of service to be offered in any Polish pharmacy." Patients particularly valued the clarity of pharmacists' explanations and the support provided in medicine substitution.

Conclusion: Ukrainian patients highly appreciated the pharmaceutical services provided by Polish pharmacists. The study highlights the necessity of expanding such initiatives to other refugee assistance points to improve healthcare accessibility. The success of this initiative underscores the importance of pharmacists in crisis situations and suggests that similar models could be implemented in other regions facing humanitarian challenges.

Pharmacists on the frontline: Enhancing disaster and epidemic preparedness in Asia

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Background Information: Asia experiences the highest frequency of natural disasters globally, including typhoons, floods, earthquakes, and infectious disease outbreaks. These events disproportionately impact vulnerable populations, strain healthcare systems, and demand effective disaster response strategies. Pharmacists, with expertise in medication management, public health education, and healthcare delivery, are uniquely positioned to address these challenges. However, gaps in disaster preparedness training, limited integration into national planning, and insufficient utilisation of pharmacists in crisis situations hinder their full potential, necessitating targeted interventions to strengthen their contributions.

Purpose: This study aimed to evaluate the roles, challenges, and preparedness of pharmacists during disasters and epidemics in Asia. It sought to identify barriers to their effective participation and propose strategies to enhance their impact, focusing on addressing gaps in training, collaboration, and policy integration.

Method: A systematic review of 120 peer-reviewed studies (2020–2024) was conducted to examine pharmacists' contributions during disasters and epidemics in Asia. Sources included case studies and research on their roles in managing medication supply chains, vaccination programs, public health education, and mental health support during disasters such as floods, typhoons, and the COVID-19 pandemic. Specific attention was given to barriers including deficiencies in disaster preparedness training, limited involvement in national disaster planning, and challenges in public health and mental healthcare delivery.

Results: Key findings include:

1.Asia's Disaster Profile: Asia accounted for 4,390 natural disasters and over 918,198 casualties between 1995 and 2022, with floods frequently triggering infectious disease outbreaks. The COVID-19 pandemic further underscored the urgency of improving pharmacists' capacity to mitigate health impacts during crises, as it exposed significant gaps in disaster preparedness and public health response. Despite their critical roles, gaps in disaster surveillance, mental healthcare, and policy integration limit pharmacists' effectiveness. 2.Significant Contributions: Pharmacists ensured the continuity of medication supply chains during disasters, supported vaccination campaigns during epidemics, and provided public health education and mental health counseling in crisis settings. During the COVID-19 pandemic, pharmacists played a critical role in ensuring the availability of essential medicines and protective equipment, easing the burden on healthcare systems. 3.Preparedness Gaps: Limited training in disaster response (86% of preparedness variability linked to training), lack of national guidelines for pharmacist involvement, and challenges in health communication were prominent barriers. 4.Regional Disparities: High-income countries like Japan and South Korea demonstrated advanced preparedness frameworks, while low- and middle-income countries in Southeast Asia faced significant resource constraints. 5.Innovative Solutions: Incorporating scenario-based disaster response training, interdisciplinary collaboration, and AI-powered tools into pharmacy education and practice were identified as promising strategies to enhance pharmacists' preparedness.

Conclusion: Pharmacists are indispensable in mitigating the health impacts of disasters and epidemics in Asia. Strengthening their education through frameworks like the Health Belief Model (HBM) and Continuing Professional Development (CPD), and integrating them into structured emergency preparedness systems, will optimise their role in protecting public health. National strategies must prioritise resource allocation, recognition of pharmacists as essential healthcare providers, and fostering interdisciplinary collaboration to enhance healthcare resilience in crisis situations.

Upcoming challenges of military pharmacy in modern warfare: Issues faced by a military hospital branch in Southern Taiwan and practical strategies to overcome them

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Introduction: Due to the ongoing controversy surrounding Taiwan's political status, the Taiwanese government has placed significant emphasis on strengthening its military power in preparation for potential conflict. To guarantee that soldiers receive timely and appropriate medical treatments in hazardous conditions, it is vital for military hospitals to enhance their capacity of combat medical care. To achieve this goal, military pharmacists in Taiwan shoulder the responsibility of providing emergency pharmaceutical care, ensuring an adequate supply of medical and pharmaceutical resources and maintaining the stability of medical devices. While general hospitals in large cities may easily fulfill these tasks, they pose a significant challenge for branches in remote areas due to limited space, budget constraints, and manpower shortages. To enhance military hospitals' ability to provide precise and adequate medical support on the battlefield while sustaining resilience, it is crucial to develop strategies that overcome these obstacles.

Method: Possible solutions to the challenges faced by military hospital branches in the field of military pharmacy were explored through a questionnaire survey. The interviewees were randomly selected from pharmacists and healthcare practitioners currently working in military hospitals.

Results: The survey results revealed that 60.4% of respondents considered the application of artificial intelligence to inventory management as a fundamental step toward improving the efficiency and quality of medical supply distribution. More than half (54.2%) agreed that additional budgetary funds should be allocated to establish advanced emergency care facilities. Additionally, respondents emphasized that medical devices should be procured based on the specific characteristics of surrounding military units to maximize their impacts on patient treatment. Establishing an extensive network with general and neighboring hospitals using the latest technology was also regarded as essential by 35.4% of participants. Such a network would facilitate the efficient redistribution of medical resources in urgent situations. Furthermore, 22.9% of respondents recommended expanding warehouse capacity to store a greater stock of pharmaceutical supplies, ensuring a quicker response and enhanced preparedness for mass casualty incidents. Implementing these practical strategies will better equip military medical teams to provide life-saving interventions, improve patient prognosis through early treatment before transfer to larger hospitals and serve as the first and strongest line of support for frontline guardians.

Conclusion: Recent military developments have underscored the pivotal role of military pharmacy and the pressing need to strengthen combat medical support capabilities within military hospital branches. With the dedication of military pharmacists, Taiwan is well-positioned to confront emerging challenges using innovative solutions, ultimately driving significant and transformative advancements in military medicine.