

**Conclusion:** Early-career and late-career firefighters have more self-injurious thoughts and behaviors and mid-career firefighters have the least.

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### Thicker Posterior Subcutaneous Adipose Tissue (SAT) and Slighter Difference of SAT During the Peri-arrest Period are Associated with Favorable Neurological Outcomes at Hospital Discharge in Patients with In-Hospital Cardiac Arrest

Tingyuan Zhou PhD<sup>1,2</sup>, Yu Cao PhD<sup>2</sup>

1. Institute for Disaster Management and Reconstruction, Sichuan University, Chengdu, China
2. West China Hospital, Sichuan University, Chengdu, China

**Introduction:** Subcutaneous adipose tissue (SAT) and bony thorax will deform and conduct driving force during cardiac arrest (CA). The association between short-term prognosis and deformation of adult thorax for patients acquired return of spontaneous circulation (ROSC) following cardiopulmonary resuscitation (CPR) was unclear.

**Method:** Clinical records and CT images were collected from eligible patients admitted to the hospital who received CPR and achieved sustained ROSC from May 31st, 2019 to June 30, 2021. The patients were divided into different groups according to discharge outcome, then into three subgroups according to the ventilation mode before and after CPR. After that, patients with the same ventilation mode before and after CPR are combined and analyzed.

**Results:** Records from 1663 patients were reviewed. After selection, 70 patients were included into this study. Significantly thicker posterior SAT post-compression was found at the 7/8/10/11 spinous process plane in patients with favorable neurological outcome ( $p < 0.05$ ). For patients receiving same kind of respiratory support before and after CPR, significantly thicker posterior SAT pre-compression at the 6/7/8/9/10/11 spinous plane and thicker posterior SAT post-compression at the 7/8/9/10/11/12 spinous plane ( $p < 0.05$ ). For patients without mechanical ventilation before or after CPR, significantly thicker posterior SAT post-compression was found at the 10/11 spinous plane in patients with favorable neurological outcome ( $p < 0.05$ ). For patients receiving mechanical ventilation before or after CPR, thicker posterior SAT post-compression was found at the 10/11/12 spinous plane was associated with favorable neurological outcome. No difference was found in the bony thorax within a different vertebral plane after subgroup analysis ( $p > 0.05$ ).

**Conclusion:** Thicker posterior SAT and greater SAT depth difference after compression was associated with favorable neurological outcome at the discharge of patients who obtained ROSC after CA. A shorter duration of chest compression ( $< 6$  minutes) doesn't cause calculable changes in patients' bony thorax in patients who obtained ROSC after CA.

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### Updated Comprehensive Framework for Disaster Evaluation Typologies

Diana Wong PhD, MCP (Nursing), GradDipEmergHealth, RN, RM, CEN, DipAppSc (Nursing)<sup>1,2</sup>, Jacqueline Van Dam BComm (Hons)<sup>3</sup>

1. UTS WHO Collaborating Centre for Nursing, Midwifery and Health Development, Sydney, Australia
2. Royal Australian Navy, Sydney, Australia
3. Syranja Consulting, Melbourne, Australia

**Introduction:** The Comprehensive Framework for Disaster Evaluation Typologies (CFDET) was originally developed in 2017 with minor updates in 2018 (CFDET2.0). CFDET was created to unify and provide agreement on the identification, structure and relationships between multiple evaluation typologies found in the disaster setting. Since the publication of this framework, the world has witnessed unprecedented disaster-related events including two (2) Public Health Emergencies of International Concern (PHEIC): COVID-19 and Monkey Pox as well as the emergence and continuation of armed conflict in various countries around the world. This work presents CFDET3.0 which incorporates updates on international disaster frameworks, disaster health updates and evaluation guidelines.

**Method:** A scoping literature review on international disaster frameworks, disaster health updates and evaluation guidelines has been undertaken and included reviewing peer-reviewed and grey literature.

**Results:** The scoping literature review revealed updates on the following important publications:

World Health Organization (WHO) Health Emergency Disaster Risk Management (H-EDRM) (2019);

International Health Regulations;  
 Universal Health Coverage (UHC);  
 Climate Change Conference (COP27);  
 Fragile and Conflict-affected Contexts (FCAC);  
 Public Health Emergencies of International Concern, and  
 Updated evaluation standards, guidelines, evidence-based reviews and knowledge management.

**Conclusion:** Incorporation of these international updates into CFDET2.0, strengthens global health and international disaster health responses with a focus on disaster health evaluation. The updated framework will be referred to as CFDET3.0. Future research is scheduled to develop a series of toolkits that will support an improved disaster evaluation process.

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### Implementation of Hospital Disaster Preparedness and Response Plan in Nepal: A Mixed Study in 3 Public Hospitals of Nepal

Prinka Singh MPH<sup>1</sup>, Hamdi Lamine PhD<sup>2,3</sup>, Anneli Eriksson PhD<sup>1</sup>

1. Department of Global Public Health, Karolinska Institutet, Stockholm, Sweden

- Center for Research and Training in Disaster Medicine, Humanitarian Aid and Global Health, Università Del Piemonte Orientale, Novara, Italy
- Department for Sustainable Development and Ecological Transition, Università Del Piemonte Orientale, VerCELLI, Italy

**Introduction:** Considering the need for hospital disaster preparedness post-Nepal earthquake 2015, the Ministry of Health and Population of Nepal developed a Hospital Disaster Preparedness and Response Plan (HDPRP) for mass casualty management. However, until now, there is no scientific literature on how the district hospitals, which are the major health service providers in Nepal, implemented their HDPRP during mass casualty incidents (MCIs). So, this study aims to understand how the HDPRP was implemented during MCIs in three district public hospitals of Nepal.

**Method:** A mixed sequential QUANT-QUAL study was designed. Out of seven districts under the severely hit category by Nepal Earthquake 2015, three districts were selected randomly. For the quantitative component, the WHO hospital emergency response checklist was adapted which was self-administered in each hospital. Based on a scoring system, each hospital was placed in one of three categories (effective, insufficient, unacceptable), to assess the level of HDPRP implementation. For the qualitative component, semi-structured interviews were conducted to understand how the HDPRP was implemented in each hospital. An inductive thematic analysis was carried out. All information was collected for the most recent management of MCI reported in the hospital.

**Results:** Out of three hospitals, two hospitals have effectively implemented their HDPRP, whereas one has insufficient implementation. Three themes emerged during the data analysis: enablers in implementation of HDPRP, barriers in implementation of HDPRP, and recommendations for the future. Multiple enablers and barriers were identified for the implementation of HDPRP, and the recommendations were identified for the hospital, hospital staff, and external stakeholders.

**Conclusion:** Implementation of HDPRP as per the protocol is difficult due to many external and internal factors that arise while managing the MCIs. The findings of this study provide the basis for the Ministry of Health and Population and district hospitals for the future update of HDPRP and planning of MCIs.

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### Educating the Public for the Nuclear Reality: Understanding Likely Behaviors in the Aftermath of a Nuclear Detonation

Morgan Taylor MPH, AEMT<sup>1</sup>, Stephanie Andino<sup>1</sup>, Zachary Zwald PhD, MA<sup>2</sup>, Jeffrey Berejikian PhD, MS<sup>1</sup>

- University of Georgia, Athens, USA
- The University of Houston, Houston, USA

**Introduction:** Amid the escalating nuclear arms race in the latter half of the 20th century, civil defense preparedness drills, commonly known as “Duck-and-Cover” drills, were practiced throughout classrooms in the United States. Since then,

education and preparedness measures have been largely replaced by fire evacuation and active shooter drills. This study endeavored to understand the likely actions that members of the public may take in the event of a nuclear detonation in the 21st century.

**Method:** Scenarios for 5 kiloton and 100 kiloton near-surface nuclear detonations were modeled using the Hazard Prediction Assessment and Capability (HPAC) software. A video was created animating the models with a voiceover that explained the initial effects of a nuclear detonation. Using the Qualtrics platform, a survey was created in which the order of behavior-based questions and the video was randomized. Lucid distributed the survey to a representative sample of the American public.

**Results:** Among 3,087 participants, only 921 (30%) indicated their confidence in knowing what to do in the event of a nuclear detonation in their city. Participants were most likely to listen to the radio, hide in an interior room, and seal windows or doors. Two thirds indicated they would “duck and cover” (n = 2034, 66%), an action that ranked below helping others (n = 2183, 71%) and wearing a mask (n = 2174, 70%). Study participants who indicated their likely behaviors after watching the video were significantly more likely to listen to the radio (p = 0.044) than those who answered such questions before watching the video.

**Conclusion:** The results of this study suggest there remains a need for emergency preparedness education for members of the public in the United States. As the threat of a nuclear detonation grows, educational methods such as video explanations may increase the preparedness of the American public.

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### The Usefulness of a Digital Whiteboard for Communication During Disasters

Megumi Iwasaki EMT, Tomohisa Shoko MD, PhD, Mayu Ogawa EMT, Tensei Suzuki MD, Yuri Asakura MD, Yuzuru Mochida MD, Shu Tanizawa MD, Keiichi Kuriyama MD, Raira Nakamoto MD, Mitsuaki Kojima MD, PhD  
Tokyo Women's Medical University, Adachi Medical Center, Adachi, Japan

**Introduction:** Information sharing during disasters tends to be confusing. We started the trial operation of a digital whiteboard (DWB) as a communication tool during disasters in 2019 and fully introduced it in 2022. The DWB is a large tablet that allows interactive communication in close to real-time in remote locations through Wi-Fi.

**Method:** To verify the usefulness of the system, DWBs were placed at triage posts in severely, moderately, and mildly damaged areas during a 2022 disaster drill responding to mass casualties to facilitate the sharing of patient information between Disaster Response Headquarters and each treatment area. In each treatment area, doctors, nurses and paramedics completed a standard form to share information about each patient. Information collected included the triage tag number, patient name, age, gender, type of injury or disease, and description of the treatment.

**Results:** Six DWBs were remotely shared, with the triage post noting the number of patients passing through each severity