

in that particular tower were evacuated within 10 minutes. Non-ambulatory patients were evacuated mainly horizontally to the unaffected tower connected through the hallways. Fire was contained by the fire department. No deaths or injuries were reported related to the incident. A total of 34 patients with potentially critical condition were transported to other hospitals in the area by the EMS.

Fires are one of the most common events encountered by hospitals worldwide. Emergency management planning, staff training, and regular drills are required for better responses to these events. Preplanned evacuation actions should be taught to the personnel. Horizontal evacuation of non-ambulatory patients can be an effective method during the initial response.

**Keywords:** evacuation; fire; hospital; training

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### (259) Disaster Potentials and a New Classification

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As known, life has three dimensions—macro-, micro-, and normo-features. Energy released by events occurring within these dimensions has the power to terminate human life. All potentials, both known and unknown, contain the potential power of creating crises for human beings. Meteor rains, collisions of planets, satellite crashes, or satellite accidents that could occur during their landing are the disaster potentials of “Macro Life”. “Micro Life” is a dimension that cannot be seen through the eyes, but can be explained with the means of modern medicine. Throughout history, these potentials caused disasters which ended in multiple deaths. Plague, tularemia, AIDS, and SARS are among the most important micro-life potentials, and their agents are known. The third dimension is “Normo Life” in which our normal life is shaped. Potentials here should be classified as “Natural Disaster Potentials (NDP)” and “Man-Made Disaster Potentials (MMDP)”. Terrorism, NBC attacks and accidents, fires, transportation accidents, wars, environmental pollution, migration, and technological accidents can be listed among the most common man made DP. Another classification among natural DP which is “Lithosphere”, “Atmosphere” and “Hydrosphere” oriented potentials, can help us understand the overall potentials. Earthquakes, landslides, and volcanic eruptions are the potentials of lithosphere. Floods and inundation are the common examples for the disaster potentials of hydrosphere, and meteorological events such as cyclones, storm, hurricanes, and tornados are the disaster potentials of atmosphere. Droughts, poverty, and tsunamis, can be listed among “mixed” disaster potentials which cover all these spherical layers.

**Keywords:** classification; crises’ disaster potentials; dimensions; events

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### (260) Shipping Disasters in the Channel: A Need for International, Multidisciplinary Rescues

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On 06 March 1987 the ferry Herald of Free Enterprise (HOFE) capsized outside the harbour of Zeebrugge. A

large rescue operation was implemented. Boats were directed towards an empty pontoon. At the pontoon, emergency care was provided and further transport was organized to convey victims to surrounding hospitals. 21 medical teams received more than 250 victims within hours of the event. The majority of casualties were due to immersion. One-third of the victims died, one-third was hospitalized, and the remaining victims were transported to emergency shelters.

The Mont Louis, a French Roro Ship, collided with the car ferry, Olau Britannia, on 25 August 1984 off the Belgian coast. The Mont Louis carried 30 cylinders with 15 ton of UF6 low radioactivity.

On 14 December 2002, the Tricolor, a cargo transporting 3,000 cars, with “shoebox” construction similar to the ferry HOFE, sunk after a collision a few miles out of Zeebrugge. Despite all kinds of warning systems, 10 near collisions and two real collisions occurred within two weeks after this event

The high density of maritime traffic in the Channel (20% of the world maritime traffic) requires for disaster planning with cross-border responses. The IMO has begun efforts to improve the safety of traffic on the sea. Human failure still is possible.

**Keywords:** accidents; international; maritime; rescue; safety; traffic

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### (261) Mass Carbon Monoxide Intoxication at Two Ice Hockey Games: Initial Approach and Long-term Follow-Up

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**Introduction:** A group of people became ill during a Premier League ice hockey game due to a carbon monoxide intoxication caused by the exhaust of an ice maintenance machine. Due to this intoxication, a total of 235 patients were seen at area hospitals. Twenty months after this event, another mass intoxication occurred during an ice hockey game. Forty-three patients presented to the index hospital at that time. To the knowledge of the authors, these are the first reported ice hockey-related mass intoxications in Belgium.

**Methods:** Apart from the file data of the different emergency departments, a follow-up mailing was sent to all patients one year after the mass intoxication events to evaluate delayed complaints and clinical controls.

**Results:** There was a response rate of 67.7%. The mean value for the carboxyhemoglobin concentrations (COHb) was 10.2% (max = 30.2%). There was a significant relationship with the presence of headaches ( $p = 0.006$ ), dizziness ( $p = 0.000$ ), and fatigue ( $p = 0.000$ ) and the COHb level. Abdominal pain, nausea, and vomiting were not significantly related. Of the respondents, 6.3% had residual complaints (headaches) with a significantly higher incidence ( $p = 0.000$ ) with high COHb levels. Only 1.3% had an abnormal neurological control. Work incapacity was not significantly related to the COHb levels.

**Conclusions:** Mass intoxications from carbon monoxide remain a risk at indoor sporting events. These short exposures cause delayed medical problems in a small number of those exposed. Symptomatology is not a useful tool for triage. The use of non-mineral energy sources like electricity is the best way to prevent such intoxications.

**Keywords:** Belgium; carbon monoxide; hospitals; indoor sporting events; mass intoxications; residual

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### (262) Enabling Technologies for Improved Situational Awareness

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**Objective:** The National Bioterrorism Civilian Medical Response Center (CIMERC) develops enabling tools that produce an effective, integrated response to complex medical emergencies. The CIMERC continues to work to meet the needs of healthcare organizations, emergency managers, and disaster responders challenged by disparate capabilities and limited resources.

**Methods:** A collaborative relationship between a local police department, a school within the designated test bed, a commercial partner, and the CIMERC was developed to offer first responders the ability to command, communicate, and adapt tactical plans in an emergency situation. The team will integrate four discrete technologies, which presently are in use in the first responder and public security space. These will be deployed for use in a complex medical emergency in the test-bed school.

**Results:** The implementation of the technology will create an ad-hoc network to share images and real-time information with the responders. This network provides an increased awareness level, allowing strategic decisions to be made and resulting in a faster and more effective response. The evaluation of this technology will be conducted through a number of tests, including a simulation exercise based on a developed scenario and user feedback.

**Conclusion:** Police, fire, and emergency medical teams rely on their communications systems and networks to provide information about the situation as it evolves, and this “situation awareness” is essential for fast, sound decision-making. The optimization of communication and visual cues during an emergency will improve a coordinated response, enhance responder safety, and minimize the negative impact of the events on the casualties.

**Keywords:** emergency; decision making; health care; response; technology

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### (264) Physical Abnormalities following Paternal Exposure to Sulfur Mustard Gas

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4. Shaheed Beheshti University of Medica, Tehran, Iran

This session will describe critical issues surrounding the National Disaster Medical System (NDMS)/Federal Emergency Management Agency (FEMA) activation during Hurricane Katrina. This response was the largest full activation of the patient movement portion of the NDMS. Expert speakers will describe the events surrounding the NDMS public health response to Hurricane Katrina, where >20,000 people were evacuated from New Orleans, Louisiana, and panelists from multiple organizations, at all levels of organization, from the local/regional front lines in New Orleans to the state and federal levels, and will present data from their Katrina experiences. Ground-level activities, giving the audience a first-hand glimpse of issues surrounding the lack of communication and organization. Dr. Sweinton and Dr. Proctor then will comment on local preparedness and the national response, with specific insights into activities and operational considerations occurring at the State Emergency Operations Center and the Federal Department of Homeland Security. Dr. Rinnert will describe her experiences receiving evacuated patients at surge capacity shelters in Dallas, Texas, and include clinical and social considerations. Finally, Dr. Marty will provide a federal perspective, delineating the procedures that were in place, as well as what should have been in place for such a large-scale disaster. The session will be concluded brief question-and-answer session.

**Keywords:** Federal Emergency Management Agency (FEMA); Hurricane Katrina; National Disaster Medical System (NDMS); preparedness; public health response

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## Oral Presentations—Theme 17: Spanish Abstracts/Resúmenes españoles

### Session 1

*Chair: Felipe Cruz-Vega*

#### Hospital Seguro Mexico

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La Organización Panamericana de la Salud (OPS) define como “hospital seguro” a “un establecimiento de salud cuyos servicios permanecen accesibles y funcionando a su máxima capacidad instalada y en su misma infraestructura inmediatamente después de un fenómeno destructivo de origen natural”. El hospital, además de proteger la vida de los pacientes y del personal de salud, debe tener una estruc-