floor covering were procured and stored. 3. System—These areas include: (a) activation procedures; (b) communication plans; (c) safety measures; (d) casualty transfer protocols; and (e) handling radiologically contaminated waste and materials. 4. Space—Potential care areas, such as radiation isolation rooms were designated. An algorithm was devised to guide casualty management.
Conclusions: Facility preparedness for radiological MCIs requires multidisciplinary involvement and the creation of trusting partnerships. More research is needed to identify the metrics to measure success objectively and aid protocol revisions.
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(A210) Chemical Sensor Trial for Nerve Agent Differentiation: Impact of Hydrogen Bonds on Detection

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Chemical warfare agents (CWAs) are a growing concern for many countries. The uses of CWAs as they can be synthesized by simple chemical reactions, and often have an extremely high toxicity. Conventional, analytical techniques for the detection of nerve agents from environmental and biological samples include gas chromatography, liquid chromatography, gas chromatography–mass spectrometry, ion chromatography, atomic emission detection, capillary electrophoresis, etc. These methods have very high sensitivity, reliability, and precision. However, in spite of these advantages, these techniques require expensive instrumentation and highly trained personnel. They also are time-consuming and unsuitable for field analysis. To meet these prerequisites of rapid warning and field deployment, more compact, low-cost instruments are highly desirable for facilitating the task of on-site monitoring of nerve agents. a quartz crystal microbalance (QCM) sensors could be a reliable and promising alternative to routine methods because of their simplicity, ease of use and high sensitivity and selectivity.1,2 In this study, we prepared QCM sensors functionalized with –NH2 and –COOH groups for differentiate diethyl ester phosphonic acid (DEHP) from diethyl phthalate (DEP), which are known as G and VX agent stimulants respectively. Infrared spectroscopy (FT-IR) was performed in order to characterize the surface of the sensor after modification and the detection. Furthermore, impact of hydrogen bonds on detection will be discussed.
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(A211) Nanosciences and CBRN Threats: Considerations about the Potential Risk of Illicit Use of Nanosystems

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In the history of humankind, any new scientific discovery has shown the risk of a "dual use" for peaceful purposes or for warfare. In regard to non-conventional weapons, the recent exponential development of nanosciences and nanotechnology can provide efficient tools for counteracting these threats, by improving the detection, protection, and decontamination capabilities in the field of CBRN defence. Nevertheless, these disciplines also may offer novel, uncontrolled means of mass destruction, leading to the synthesis of new, intentionally toxic systems. Furthermore, several points of concern are linked to the new concepts of "nanotoxicology" and "nanopathology: If a multidisciplinary approach is needed to study nanosciences and nanotechnologies, a multidisciplinary approach also is needed to have a strict control on potential illegal uses of nanosystems. Experts active in various fields, such as academic, industrial, military, and health protection institutions, must work cooperatively to constantly follow the state of the art, note which kind of critical emerging technologies may lead to illicit uses, and control the diffusion of hazardous nanosystems that may be potential precursors of weapons of mass destruction, and cooperate with CBRN emergency prevention organizations in order to plan suitable countermeasures. This presentation will cover some examples of nanosystems applied to defense from non-conventional warfare agents and answer questions regarding potential misuses of basic nanoscience and nanotechnology findings.
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(A212) The 2008 Mumbai Terrorist Attacks and the Changing Pattern of Violent Injuries

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Introduction: The 26–29 November 2008, terrorist attacks in Mumbai, have been referred to as "India's 9/11". Violent events in Mumbai over the past six decades were researched to understand the changing pattern of violent injuries.
Methods: A complex, retrospective, descriptive study on terrorist events was performed, using event reports, legal reports, newspaper reports, and police and hospital lists. The distribution of victims to various city hospitals, the critical radius, surge capacity, and nature of interventions required were assessed. The profile of those killed in the attacks was noted by sex, nationality, and occupation. Besides the overall mortality and case-fatality ratio, the critical mortality was calculated based on the death rates among the critically injured.
Results: In 51 violent events in Mumbai over a 60-year period (1950–2009), 1,582 people were killed and 4,145 were injured. In the Mumbai terrorist attacks of 2008, the financial loss due to direct physical damage was INR 847,612,971 (US$18.5 million). Among those killed, the average age was 33.4 years, 80% were male, and 12% were foreign nationals. The case-fatality ratio for this event was 36.2% and the mortality among the critically injured (critical mortality rate) was 11%. Among the injured, 79% were male and the average age was 33.21 years (three months–85 years); 38.5% of patients arriving at the hospitals required major surgical intervention.
Conclusions: The injuries of violent events in Mumbai have been changing due to the use of heavy firepower and explosives. Strengthening the public hospitals for trauma care is a

medical counter-terrorism response for future terrorist attacks. These attacks have affected the lives of the common person in Mumbai, in terms of increased security checks, alerts, and fear of further attacks. These are areas of further research.

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(A213) Review of the Mass Casualty Incident after a Bomb Explosion in a Crowded Restaurant

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Terror struck Pune on 13 Feb. 2010 as a powerful bomb ripped apart a popular restaurant, killing nine people and injuring more than 45. A retrospective analysis of the injury patterns was done.

Materials and Methods: The CDC template, viz. "Bomb Surveillance Form" was used for the data collection, that was analyzed by SPSS version 15 software.

Results: Of the 50 survivors transferred to the four nearby hospitals, 11 (22%) of them had severe life threatening injuries, with 19 patients (38%) having primary blast injuries, Secondary type of injury was seen in, and 22% had tertiary injuries. Orthopedic (24%) and burn injuries (36%) were prominent. The mortality rate was 16%.

Discussion: The occurrence of MCI in an unexpected scenario overwhelms the medical resources and challenges the emergency medical facilities. Analysis of the injuries revealed that fatal outcome was related to presence of shock, severe lung, bowel injury, presence of more than four types of injury and greater than 50% burns.

Strengths: Highlights the importance of being able to recognize the blast injury patterns and their management.

Limitations: Inability to compare with other blast injuries due to several missing data.

Conclusion: Blast injury sustained in a small, enclosed space is one of the most serious and complicated forms of multiple trauma. Hospitals and civic authorities must be prepared to counter this menace of modem times. Not everything that is faced can be changed, but nothing can be changed until it is faced.

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(A214) Road War: A 200-Vehicle Crash, Special Report

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The last thing the world needs is another war.[1] Everyday about 3000 people die and 30,000 people are seriously injured on the world's roads.[2] Furthermore, for people who survive the crash, additional suffering and frustration occur because of administrative, legal, and social barriers.[3] Since transport to hospital usually takes 30–45 minutes, the 'golden hour' in which 48% of deaths occur is spent mainly in the prehospital environment.[4] On March 11, 2008 at 7:30 AM a very foggy morning, a major car crash occurred on the high way from Abu Dhabi to Dubai. Initial scene response was conducted by Abu Dhabi traffic police Abu Dhabi Police Ambulance and Rescue Sections helped by Dubai. Casualities were transported to 2 hospitals in Abu Dhabi; Al Mafraq and Al Rahba. The Authors describes Al Rahba hospital response that received 159 causalities (almost half of the causalities).

Results: Three victims died immediately on scene. Most of the causalities were triaged and re triaged as Priority 3 (green), suffered from extremity trauma, were treated and discharged. Twenty patients were triaged as Priority 2 (yellow) and were admitted to the hospital, Three patients were priority one (red) were admitted to the ICU, one of them died 10 days later due to severe head and chest injuries.

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(A215) Delayed Diagnosis of Injury in Survivors of the February 2009 Crash of Flight TK 1951

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Introduction: In 2009, a Boeing 737 crashed near Amsterdam, traumatically injuring 126 people. In trauma patients, some injuries initially escape detection. The aim of this study is to evaluate the incidence of Delayed Diagnosis of Injury (DDI) and the effects of tertiary survey on the victims of a plane crash.

Methods: Data collected included documentations of DDI, tertiary surveys, Injury Severity Scale (ISS) score, Glasgow Coma Scale score, number and type of injuries, and emergency intervention. Clinically significant injuries were separated from non-clinically significant injuries. Comparison was made to a crash in the UK (1989), before advanced trauma life support became practiced widely.

Results: All 126 victims were evaluated in a hospital emergency department; 66 were admitted with a total of 171 clinically significant injuries. Twelve clinically significant DDIs were found in eight patients (12%). In 65%, a tertiary survey was documented. The DDI incidences differed for several risk factors. Eighty-one survivors of the UK crash had a total of 332 injuries. Of those with > 5 injuries, 5% had a DDI, versus 8% of those with ≤ 5 injuries.

Conclusions: The DDI incidence in this study was 7% of the injuries in 12% of the population. A tertiary survey was documented in 65%; ideally this should be 100%. In this study, a high ISS score, head injury, > 5 injuries, and emergency intervention