The difference in the means for the second attempts at ETT with and without CPE was 2.3 seconds (95%CI 0.2 –4.4, p = 0.035). The difference in the means for the first attempts with and without CPE was 0.9 seconds (95%CI -7.0–8.9, p = 0.816) and the difference in the means for the second attempts with and without CPE was 9.7 seconds (95%CI -5.0 –24.5, p = 0.184). The difference in the means for the first attempts with and without CPE was 1.39 seconds (95%CI 0.3–2.5, p = 0.012). The difference in the means for the second attempts a King LT with and without CPE was 1.2 seconds (95%CI -0.4–2.8, p = 0.136).

Conclusions: No clinically significant differences in the times to placement of these airway devices were found. In a controlled environment, ETT placement is recommended to definitively secure the airway.

Keywords: airway; cadaver; chemical; disaster health; endotracheal tube; laryngeal mask airway; laryngoscopy

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(D37) Effect of Wearing Chemical Protective Equipment on Gaining Intraosseous Access Using the Bone Injection Gun in a Cadaver

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Background: Medical personnel may be called to provide life-saving techniques while wearing chemical protective equipment (CPE). The effect of obtaining intraosseus (IO) access using the Bone Injection Gun (BIG) while wearing the Joint Services Lightweight Integrated Suit Technology, butyl rubber gloves, and the M-40 protective mask was evaluated.

Methods: Ten emergency medicine residents each placed a total of four IO needles in random order using the BIG in six unembalmed cadavers: two while wearing CPE and two using only standard precautions. The mean difference in time to placement was evaluated using a paired t-test. Placement was verified by aspiration of marrow and was recorded in a 2 x 2 table for analysis using Fischer's Exact.

Results: The time to placement for the first and second attempts without CPE was 29.6 and 23.3 seconds, respectively. The time to placement for the first and second attempts with CPE was 46.1 and 28.9 seconds, respectively. The difference between mean times with and without CPE was 11.0 seconds (95% CI 2.8–19.2, p = 0.014). All 20 BIG placements were successful when placed without CPE and 16 of 20 were successful with CPE (80%, 95% CI 57.8–92.5, p = 0.053).

Conclusions: Intraosseous access is an alternative to placing an intravenous line. The difference in time to gain IO access while wearing CPE was not clinically significant. All four unsuccessful attempts were placed appropriately, however, were pulled out when the BIG was removed. Increased training with the BIG while in CPE may improve success rates.

Keywords: Bone Injection Gun; cadaver; chemical; chemical protective equipment; disaster health; intraosseous access

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(D38) A New Tool for Managing Casualties in the Emergency Department during a Radiation Disaster

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Introduction: Mass-casualty incidents involving radiation are rare but potentially devastating events. Even incidents with a small number of casualties are challenging due to the specific nature of the information and decisions required, and the rate of decay of knowledge about radiation. A package of specific forms and guidelines could assist emergency department (ED) physicians with this process.

Methods: A seven-page tool was developed as part of a project (METER 2008) funded by the Canadian Chemical, Biological, Radiological, and Nuclear Research and Training Initiative (CRTI) to facilitate the ED management of radiation casualties. These forms cover triage, the history and physical examination, diagrams to mark areas of contamination, standing orders, and a means of estimating Acute Radiation Syndrome severity. The tool was piloted at a workshop in Quebec City in November 2007. Later, a questionnaire was distributed to participants to assess the usefulness. The tool will be further tested at other workshops across Canada during the winter.

Results: Participants found the tool to be useful, Their comments and improvements will be presented.

Conclusions: The tool demonstrated in this presentation can be used to assist ED staff with the triage and management of casualties with exposure to radiation.

Keywords: emergency department; guidelines; preparedness; radiological; tool; training

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(D39) Dirty Bomb Algorithm

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Introduction: Radiation exposure is a concern to emergency department staff. We developed a dirty bomb algorithm for a free-standing pediatric hospital. We tested the algorithm during a drill and will report our findings.

Methods: The dirty bomb algorithm was tested during a disaster drill. The drill scenario was that a bomb had gone off near a local school and radioactive material was released. Fifteen victims were given different roles to play, ranging from the worried well to being seriously injured. The drill was observed and critiqued by experts in disaster planning and radiation exposure.

Results: The algorithm was able to sort the victims into the categories of: (1) no exposure/no contamination; (2) exposed, no contamination; (3) contaminated (needs decontamination); and (4) needs medical assessment for radiation exposure. The decontamination team was able to follow the algorithm and decontaminate the appropriate patients. The emergency department staff had very limited knowledge of radiation exposure or contamination.

Conclusions: The algorithm developed can help sort a large number of people who may have been exposed or con-

taminated by a dirty bomb. The emergency department staff needs more training to care for patients exposed to radiation.
Keywords: algorithim; dirty bomb; drill; pediatrics; radiation
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(D40) Development of Medical Hazardous Material Database for a Chemical Disaster

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Introduction: Although there is information about hazardous materials and related activity during hazardous material accidents, chemical disasters, or chemical terrorism, it is not comprehensive, cannot be accessed easily, and is not sufficient for the specific situation, as in a toxic accident in a household or chemical accident in industry. Additionally, the information is not prepared for the emergency medical response in general. The authors developed a comprehensive database system for medical hazardous materials and assessed the application of the system.
Methods: A questionnaire was answered by 534 persons who are hazardous materials-related workers, experts, or laypersons about the necessary contents of the database and the methods of application. Forty-six database fields were developed relating to chemical accidents and hazardous materials, the most important contents were extracted through a four-stage process. The database fields were prioritized in 19 classification groups based on an existing database and our survey.
Results: There were 111 chemicals that were determined to be most necessary to include in the database. The final classification of database fields was eight groups. A Website was constructed of the resulting database for real application.
Conclusions: Although it has become possible to provide emergency information about chemical accidents, terrorism, or disaster, comprehensive information from the accident site to hospital still is needed for a quicker response, such as the identification of chemicals. The next step will be developing an information-providing system using mobile devices.
Keywords: chemical disaster; database; hazardous material; information; medical
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(D41) Somatic Pathology following Radiation Exposure: A Longitudinal Study

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Introduction: The study presents the generalized results of the long-term epidemiological, clinical, biochemical, cytogenetic, and immunological studies dedicated to the mechanisms of the development of somatic pathology in the remote period in the victims of radiation accidents. The major accidents were included, i.e., Chernobyl nuclear power plant accident, radiation accidents on ships with nuclear energy devices, nuclear weapons tests, and other accidents.
Methods: The two databases were created at the Nikiforov Russian Center of Emergency and Radiation medicine (St. Petersburg) in order to monitor the health status of the victims of radiation accidents: (1) epidemiological database with sub-registries for leukosis, thyroid cancer and other cancers, (2) scientific clinical database.

The full range of all up-to-date and evidence-based clinical investigations was used including tomography, bio- and immunochemical methods, cancer markers and hormone levels assessment.
Results: The epidemiological analysis showed that after five years following the exposure there is a significant rise in the incidence of somatic pathology across all age groups. After 10 years following the exposure 38% of clean-up workers already developed chronic diseases, while among those who were exposed to the dose of more than 25 cGy the incidence was more than 50%. Over 20 years of observation, the average number of diagnosed chronic diseases per clean-up worker increased from 1.4 to 10.6.

The most prevalent symptoms (>60%) are cardiovascular diseases, musculoskeletal and gastrointestinal diseases. From the results of cytogenetic and biochemical investigations the main pathological mechanism is the disturbance of microcirculation and endothelial dysfunction. In 60–80% of clean-up workers' muscular-skeletal diseases were diagnosed with the main manifestation and possible mechanism being an osteopenic syndrome.

The cytogenetic studies showed that across all age groups, the incidence of chromosome aberrations is significantly higher than in the control group. The assessment of cancer markers confirmed the elevated risk of developing cancer. This was accompanied by markedly elevated levels of hydrogen peroxide and other free-radical and lipid oxidation indicators in the blood.
Conclusions: The results of the complex epidemiological, clinical, biochemical, cytogenetic, and immunological investigation performed on the patients exposed to ionizing radiation due to a number of radiological accidents described the mechanisms of the development of somatic pathology due to radiation exposure.
Keywords: exposure; somatic pathology; radiation
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Oral Presentations—Special Populations

Disaster Management Assessment of Small, Long-Term Care Nursing Homes in Taiwan

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The elderly comprise 10% of the population in Taiwan, and the total still is growing. With the unprecedented demographic change in Taiwan, it is important to establish assessment methods of disaster prevention mechanisms for long-term nursing institutes. For example, the width of the