of the National Intervention Plan for Radiological Emergencies. After a review of the available open source literature, the plan was developed in cooperation with the involved authorities, mainly based on the recommendations of International Atomic Energy Agency (IAEA), Radiation Protection Commission (Germany), and the British Institute of Radiology (BIR) *Manual on the Acute Radiation Syndrome.*

If a radiation accident cannot safely be handled by the occupational radiation protection system, the concept envisages a multi-step approach based on the hazardous material response of the first responders at the scene (handover to emergency medical services (EMS) after gross-decontamination by the fire service). Any patient should be transported to a hospital for further management. Hospitals are divided in the categories "basic", "regional", and "central".

Basic hospitals should not receive patients known to be involved in radiation accidents, but must prepare for self-referred victims and to be able to perform emergency decontamination similar to that done on scene and first diagnostic measures before transferring the patient. In regional hospitals all specialties with knowledge about radiation effects (mainly radiotherapy and nuclear medicine) must form a cooperational network. A Radiation Emergency Management Plan should comprise the preparation of facilities and equipment, alerting procedures, and an emergency telephone number for inquiries. In central hospitals, this cooperational network is augmented by hematological and intensive care competencies in order to provide all measures of diagnostics and therapy. If necessary, the REMPAN-network can be contacted for further assistance.

The described multi-step-approach appears appropriate for Austrian circumstances; however, its practicality still needs to be demonstrated by exercises and experience.

Keywords: Austria; acute radiation syndrome; contaminated patients; decontamination; detection; planning; radiation accidents
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Care of the Chemically Dead: A Tale of Two Bodies

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Introduction: A case of suicide by ingestion of aluminum phosphide in 1998 in Sydney, Australia and a case of suicide by potassium cyanide ingestion in 2003 in Avon, United Kingdom, resulted in cadavers that posed a residual chemical hazard. The difficulties experienced in managing the contaminated body, from the hospital through to burial in Sydney, provided the basis for planning through a response subsequently used to manage the contaminated cadaver in Avon.
Methods: This is a case review of the two incidents from emergency department and fire service records, and video footage of the burial of the cadaver in Sydney.
Discussion: The aluminum phosphide incident in Sydney highlighted the need for the effective handling of chemically contaminated cadavers. This included the safe handling and storage of the body, an effective multi-agency hazardous materials response at the hospital, and the need for dignified arrangements to be in place from death to burial.

The lessons learned and subsequently, used successfully in Avon, United Kingdom in 2003, included the ready availability of gas-tight, chemical-resistant, body bags, and chemical-resistant personal protective equipment for health service staff.
Conclusions: Planning for the handling of chemically contaminated cadavers ensures a dignified approach to the cadaver and the family of the deceased. Planning for the management of one chemically contaminated body provides a template for managing a multiple fatality chemical incident. Effective, international cross-discipline communication allows lessons identified from incidents to be shared, and subsequently improve response procedures elsewhere.

Keywords: body; cadaver; chemical; contamination; incident management
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Management of Mass Fatalities following a Chemical, Biological, or Radiological Attack

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Contaminated mass fatalities following the release of chemical, biological, or radiological agents pose a potential major health hazard. A United Kingdom government investigation has identified a number of areas of risk. This presentation outlines the findings of the study and describes specific pathways for the management of contaminated and non-contaminated fatalities. Factors determining the choice between cremation and burial are discussed. Effective decontamination remains a neglected area of study for both fatalities and casualties.

Keywords: casualties; chemical, biological, or radiological agents; decontamination; risk factors; United Kingdom
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Poster Presentations—CBRNE

(D36) Effect of Wearing Chemical Protective Equipment on Placement of Airway Devices in a Cadaveric Model

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Background: Medical personnel may be called to provide life-saving techniques while wearing chemical protective equipment (CPE). The effect of placing airway devices while wearing the Joint Services Lightweight Integrated Suit Technology, butyl rubber gloves, and the M-40 protective mask were evaluated.
Methods: Twenty emergency medicine residents placed an endotracheal tube (ETT) using direct laryngoscopy, a laryngeal mask airway (LMA), and King LT airway in four unembalmed cadavers while either wearing CPE or using only standard precautions. Mean differences in time to placement were evaluated using a paired *t*-test.
Results: The difference in the means for the first attempts with and without CPE was 3.8 seconds (95%CI 0.9–6.8, $p = 0.014$).

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-