

taminated by a dirty bomb. The emergency department staff needs more training to care for patients exposed to radiation.

**Keywords:** algorithm; 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