

These indicators were used in a new concept of training of prehospital command and control. The performance indicators were emphasized to students in lecture form and in different simulation sessions. In the practical exam, these indicators were used as a quality tool for passing or failing the students. In 15 months, this new concept of training of medical first responders has spread to over 750 users in Sweden. **Conclusion:** The postulated set of performance indicators could be used in any training of medical first responders at the scene of a major incident or disaster. Results can be presented numerically to serve as a quality measurement tool. **Keywords:** command and control; first responders; performance indicators; training

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### **Bioterrorism Training and Curriculum Development Program**

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There is a compelling need for clinicians to be trained in recognizing and responding to a bioterrorist event, creating an urgency to revisit the planning and educational processes to address the necessary changes. This project demonstrates a model to bridge the curriculum gap of knowledge, skills, and experiences for bioterrorism preparedness in three graduate, healthcare, clinician groups: (1) pharmacy; (2) physician assistant (PA); and (3) advanced-practice nurses (APN). To ensure that an adequate supply of healthcare providers are trained in bioterrorism surveillance and monitoring, Shenandoah University faculty are committed to developing and implementing curricular materials to teach the fundamentals of bioterrorism event recognition, documentation, monitoring of events, and the therapeutic management of patients who are affected.

The curricular content required to address these gaps utilizes online technology, personal digital assistants (PDA), and experiential components that include a multi-tiered drill. The project involves a student cohort of approximately 160 students including: (1) 109 second-year pharmacists; (2) 37 PAs; and (3) 13 APNs. The cohort provides for a systems theory model approach, which is applied to curriculum design and evaluation, and which emphasizes input (knowledge and skills), process (experiential component), and output (performance-based, multi-tiered, multi-disciplinary, bioterrorism exercise).

Decision-making is the key element in training for a disaster. In order to develop information-tracking proficiencies and data-acquisition skills for patient management, students will be provided with a PDA programmed with preconfigured software. A database interface developed at Shenandoah University will be used, which consists of a computational algorithm that spawns e-mail if/when critical numbers of symptoms appear. This database will consolidate patient information from students to demonstrate epidemiological principles including recognition of increased incidence patterns of symptom/disease complexes. The clinical preceptors will be oriented to the

project and given access to the online bioterrorist course, thereby cascading the training of clinicians. Decision-making will be evaluated using the performance-based bioterrorism exercise with the Winchester Medical Center in Winchester, Virginia.

**Keywords:** advanced-practices nurse (APN); bioterrorism; curriculum; disaster; education; personal digital assistant; pharmacists; physician assistant (PA); preparedness; training

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### **Education and Training for Mass-Casualty Incidents: A One-Day Concept Combining Theoretical Background, Interactive Workshops, and Hands-On Training in a Real-Time Simulation**

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As the possibility of mass-casualty incidents (MCI) in modern industrial countries due to public transportation crashes and terrorist attacks has increased over recent years, we must ask whether we are prepared for these incidents. Emergency medical services (EMS), fire brigades, and local authorities need background information, detailed plans for action, and actual practice together to make sure their plans are efficient.

An educational concept was developed, combining these three aims to give an update on current strategies. The result was a one-day course on 11 September 2004 in Dachau. It consisted of: (1) presentations of the theoretical backgrounds by international specialists; (2) interactive workshops under the guidance of these specialists; and (3) a live scenario in which the participants were able to put the developed concepts to the test.

The theoretical presentations covered topics such as terrorist attacks on public buses in Israel, management of a major railway crash in Eschede/Germany, international programs for airplane crashes from the United States (US), and a presentation about an airplane collision over southern Germany. The presenters were international specialists from Germany, Israel, and the US, all of whom had not only the theoretical background, but also practical experience with these topics.

In the second part of the day, the participants were assigned to nine different workshops according to their actual function within the rescue system, e.g., fire chiefs, incident commanders, coordinating emergency physicians (CEP), members of the rescue coordination center (RCC), etc. These workshops were guided by international and local experts to develop modern concepts that fit into the actual local settings. The aim was that, by the end of the day, every workshop should be able to present a working strategy for a simulated mass-casualty incident.

The results of the workshops then were tested in simulated MCI in which a public bus with >50 passengers was hit by a car carrying a bomb inside. Together with the local EMS and fire brigade of Dachau, the participants tried to respond according to the plans developed in the workshops to manage this MCI.

With more than 250 participants from Germany, Austria, and Switzerland, this course was the source of a

vast amount of information and many interesting contacts. It also helped develop working concepts for the simulated MCI. It is the first of many steps that must be taken to become prepared for a possible future MCI.

**Keywords:** education; mass casualty; preparedness; simulation; training; workshops

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### Disaster Training Competencies for Healthcare Workers

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**Introduction:** Although training and education have long been accepted as an integral part of disaster preparedness, many current practices have not been developed using evidence-based methods. The need for effective training of healthcare staff at all levels and “development of standards and guidelines for education and training in the multi-disciplinary health response to major events” has been identified by the 13th World Congress on Disaster and Emergency Medicine (Melbourne) as one of its highest priorities. Systematic evidence-based methods were described to derive competencies relevant to all hospital healthcare workers and staff during disasters.

**Methods:** A competency was defined as a broad area of personal capability, including knowledge and skill, and the application of that knowledge and skill to the standard of performance required. Cross-cutting competencies were intended to be applicable to all hospital, healthcare workers and staff. The conceptual development of competencies incorporated an evidence-based process with the following steps: (1) systematic review of existing competencies, courses, and training objectives, peer-reviewed literature, and educational theory; (2) synthesis of new competencies; (3) expert panel review; (4) refinement of new competencies; and (5) development of terminal and enabling objectives for each competency covering requisite knowledge, attitudes, and skills.

**Results:** Through a structured, iterative, evidence-based process, the following seven competencies were developed: (1) recognize a potentially critical event and implement initial actions; (2) apply the principles of critical event management; (3) demonstrate critical event safety principles; (4) understand the institutional emergency operations plan; (5) demonstrate effective critical event communications; (6) understand the incident command system and your role in it; and (7) demonstrate the knowledge and skills needed to fulfill your role during a critical event. For each of the cross-cutting competencies, comprehensive terminal and enabling objectives were developed.

**Conclusion:** Cross-cutting competencies developed through a systematic evidence-based approach serve as a paradigm for hospital, healthcare worker disaster training and education.

**Keywords:** competencies; disaster; education; evidence-base; healthcare; hospital; incident command system; management; objectives; recognition; safety; training; workers

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### Free Papers Theme 19: Infectious Disease

#### Attitudes, Concerns, and Knowledge of Taiwanese Medical Laboratory Technologists and Students Regarding HIV and AIDS

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**Background:** The World Health Organization (WHO) estimated that in 2003 there were almost 38 million people living with Human Immunodeficiency Virus (HIV) worldwide. Medical laboratory workers are the second largest professional group with potential exposure to HIV through handling of biological specimens. Previous studies from the United States, New Zealand, the South Pacific, and Finland have shown that medical laboratory workers have many unfounded fears regarding HIV and Acquired Immune Deficiency Syndrome (AIDS) that impact their work practices and attitudes towards AIDS patients.

**Objective:** To describe the practices and concerns of medical laboratory technologists and medical laboratory technology students regarding HIV/AIDS in central and southern Taiwan.

**Methods:** Questionnaires were distributed to all medical laboratory technologists and medical laboratory technology students in four hospitals (Pingtung Christian Hospital, Show Chwan Memorial Hospital, Changhua Christian Hospital, Zhushan Show Chwan Hospital) and three medical laboratory technology schools (Chunghwa Medical Technology College, Chungtai Medical Technology College, Chung Shan Medical University) in central and southern Taiwan.

**Results:** Of a potential pool of 530 persons, 380 (144 students and 236 medical laboratory technologists) returned questionnaires (response rate = 72%). There was no significant difference in response rates between students and medical laboratory technologists. Respondents were predominantly female (77%) and 196 (52%) previously had attended workshops or lectures specifically on HIV/AIDS.

More than ninety percent of the respondents always wore gloves when handling a variety of biological specimens and 63% treated all specimens as potentially HIV-positive. There was a significant association between the use of gloves and the concern about acquiring HIV/AIDS or hepatitis at work ( $p < 0.001$ ). Respondents were concerned similarly about acquiring HIV or hepatitis B in their work place (84% and 77%, respectively). A total of 44 medical laboratory technologists were seriously considering leaving the workforce because of potential contact with AIDS patients or HIV-positive biological samples. This was, in turn, related to their training and practical HIV/AIDS knowledge.