emergency response. This hospital DISASTER paradigm has the following elements:

1. detect the event if occult and determine the event characteristics that will modify in-hospital emergency response;
2. inform persons who immediately need to know of the event, activate the hospital emergency incident command system (HEICS) according to pre-determined criteria or judgment, and initiate key critical emergency response elements (e.g., deploying a portable decontamination facility, postponing elective surgical cases, and deploying chemical antidotes to the emergency department;
3. implement safety and security measures (including an assessment of hazards);
4. accommodate arriving patients through surge capacity, assign personnel to various HEICS units, and assess ongoing patient needs and capacity requirements;
5. sort arriving patients (triage) with the first triage question being whether they are contaminated or infectious;
6. treat arriving patients;
7. empty the emergency department (and other hospital areas as needed) through admission, discharge, or secondary distribution to other facilities; and
8. record patient and event data and implement recovery efforts (including mental health services).

This paradigm was used to summarize the complex elements in previously written emergency department emergency operations plans for: (1) trauma and burn emergencies; (2) chemical emergencies; (3) radiation emergencies; and (4) emergencies with pediatric patients (with biological emergencies and emergencies with mental health needs in progress).

Conclusion: The ADLS DISASTER paradigm may be modified for hospital emergency preparedness and may serve as a convenient tool for logically organizing the complex elements of in-hospital emergency response.

Keywords: disaster; education; emergency department; hospital emergency incident command system (HEICS); preparedness

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What is the Threshold Value for Mixed Venous Oxygen Saturation (SvO_2) in Patients with Acute Cyanide Poisoning?

Frédéric J Baud; Gilles Guerrier

Departments of Medical and Toxicological Critical Care, Lariboisière Hospital, Assistance Publique Hôpitaux de Paris, University Paris 7, Paris, France

Introduction: Although cyanide increases mixed venous oxygen saturation (SvO_2) through its blockade of mitochondrial respiration, the diagnostic value of SvO_2 is unclear in patients with cyanide poisoning.

Objective: This study sought to determine SvO_2 in patients with suspected cyanide poisoning before antidotal therapy.

Methods: This was a prospective study of SvO_2 in six patients who were admitted to Lariboisière Hospital with suspected cyanide poisoning. SvO_2 was determined in blood specimens that were collected from Swan Ganz catheters in patients 1, 2, 4, and 5, and femoral veins in patients 3 and 6 before antidotal therapy was administered.

Results: The mean age of the six patients was 39 years of age (SD = 15 years of age). Four patients were comatose, one had altered mental status, and one had normal neurological status. Relevant data are shown in Table 1. The lowest SvO_2 measured was 83.7%. Only three patients had SvO_2 >90%, a threshold suggesting inhibition of oxygen utilization, including two patients with femoral vein samples.

Conclusion: Inhibition of oxygen utilization may be only transient and area-dependent in humans who are severely poisoned with cyanide.

Keywords: cyanide; cyanide poisoning; mixed venous oxygen saturation; oxygen utilization

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Case Report: Cyanide as an Unrecognized Cause of Neurological Sequelae in a Fire Victim

Frédéric J. Baud;[1] Monique Boukobza;[2] Stephen W. Borron[3]

1. Departments of Medical and Toxicological Critical Care, Lariboisière Hospital, Assistance Publique Hôpitaux de Paris, University Paris 7, Paris, France
2. Department of Neuroradiology, Lariboisière Hospital, Assistance Publique Hôpitaux de Paris, University Paris 7, Paris, France
3. Department of Emergency Medicine, George Washington School of Medicine, Washington, District of Columbia USA

Introduction: Early and late neurological manifestations of smoke-induced cyanide poisoning are controversial.

Objective: This presentation describes a fire victim with severe cyanide poisoning, but without carbon monoxide poisoning, which resulted in early and late neurological sequelae.

Methods: This is a case report using emergency medical services and hospital records.

Results: A 60-year-old woman was found apneic, pulseless, and comatose at the scene of a fire. Endotracheal intubation and mechanical ventilation were performed and hydroxycobalamin (Cyanokit®) 2.5 g IV was given at the scene. Before hydroxycobalamin administration, carboxyhemoglobin and cyanide levels were 11% and 69 µmol/L respectively. After hydroxycobalamin administration, her blood pressure was 120/80. Further antidotal therapy was not given. The patient gradually awoke over the next several days. On Day 8, she spontaneously opened her eyes and reacted to pain appropriately. On Day 30, choreoathetotic movements and dysarthria appeared, resolving over the course of one month. An extrapyramidal hypertonia, predominantly involving the left upper arm and face, persisted for six months. On Day 7, a magnetic resonance imaging (MRI) of her brain revealed hypointensity on T1-W and hyperintensity on T2-W1 in the putamini, globus pallidi, and caudate nuclei. On Day 17, computerized tomography of her

brain showed bilateral hypodensity in the putamini and globus pallidi, consistent with hemorrhagic necrosis. On Day 60, brain MRI revealed bilateral hyperintensity in the same areas, which subsequently decreased six months and two years later.

Conclusion: Cyanide poisoning may predominate over carbon monoxide poisoning in smoke inhalation. Cyanide was the most likely cause of the patient's early neurological manifestations (including apnea and hydroxycobalamin-corrected shock), and late neurological manifestations. This case also questions the dose of hydroxycobalamin that should be administered in such cases.

Keywords: cyanide; cyanide poisoning; smoke inhalation
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Building Hospital-Ready Medical Surge Capacity for Disasters

Marilyn Biviano;[1] Mary Duley;[2] Atila Omer;[3] James G. Hodge[4]
1. Health Resources and Services Administration, Department of Health and Human Services, Washington, DC USA
2. Office of Public Health Preparedness, Connecticut Department of Public Health, Hartford, Connecticut USA
3. Collaborative Fusion, Inc., Bethesda, Maryland USA
4. Center for Law and the Public's Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland USA

Introduction: Building health personnel emergency surge capacity is an essential component of hospital preparedness. The Emergency System for Advance Registration for Volunteer Health Professionals (ESAR-VHP) Technical and Policy Guidelines, Standards, and Definitions were developed with the assistance of ten National Working Groups that provided expertise and perspective on how to address key topics confronting the National Bioterrorism Hospital Preparedness Community. Twenty-four States and several professional associations and volunteer organizations supported and contributed to the Guidelines development.

Objective: This panel presentation will describe the following: (1) the challenges in developing a national system of state-based medical personnel registries; (2) the ESAR-VHP Guidelines, Standards, and Definitions development and implementation issues; (3) emergency credential standards that have been developed for 20 hospital-based professions; (4) the legal and policy issues facing volunteers, and how states and hospitals are addressing these issues; and (5) Connecticut's hospital-based ESAR-VHP, operated by the Connecticut Department of Public Health in conjunction with Yale New Haven Health System, and why it is a model for other states and the United States.

Keywords: Connecticut; development; disaster; emergency; health personnel; hospital; surge capacity, United States
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Active Learning, Bioterrorism Clinics, and Continuing Professional Education: An Ideal Combination

Jeffrey Bratberg;[1] Brett Feret;[1] Stephen Kogut;[1] Gregory Low;[1] Alysia Mihalakos;[2] Michael Simeone[2]
1. University of Rhode Island College of Pharmacy, Kingston, Rhode Island USA
2. Rhode Island Department of Health, Providence, Rhode Island USA

Objective: This presentation will describe the integration of active learning and emergency preparedness techniques into an annual, continuing, professional education program to enhance learning of advanced concepts in bioterrorism dispensing clinic design, operation, and evaluation.

Methods: After didactic lectures on bioterrorism agents, government roles in bioterrorism response, and pharmacist surveillance, a mock bioterrorism clinic "play" was performed on-stage using audience volunteers as actors in predetermined clinic volunteer and patient roles. To create a more realistic emergency clinic, a randomly selected portion of the audience was assigned clinical volunteer roles, and asked to set up a dispensing clinic quickly. The remaining audience members were patients, some of which were assigned roles to challenge the clinic volunteers. Program facilitators, all experts in bioterrorism clinic design and operation, provided assistance and evaluation. An open critical discussion ("hot wash") was conducted immediately following the program.

Results: During the "hot wash", some participants reported that the play, with its attendant chaos of establishing the dispensing clinic under time constraints, represented a paradigm shift from typical continuing education programs. Many participants reported that the play increased their understanding of the concepts of emerging leadership and the flexibility required in the fog of a bioterrorism emergency.

Conclusion: Continuing, professional education programs that integrate active learning techniques may facilitate practical learning of the development and operation of bioterrorism dispensing clinics. Whole audience participation may enable more voices to contribute to continuing education programs.

Keywords: bioterrorism; clinics; continuing education; leadership; learning, active; simulation
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Development and Application of a Bioterrorism Emergency Management Plan

Jeffrey Bratberg;[1] Kimberly Deady[2]
1. University of Rhode Island College of Pharmacy, Kingston, Rhode Island USA
2. University of Kentucky College of Pharmacy, Lexington, Kentucky USA

Objective: This presentation describes the development and application of a bioterrorism emergency management plan (EMP) during a university pharmacy course.

Methods: Descriptive information was obtained from personal observations and anonymous teaching evaluations by students.