

Clinical Decision Support for Visual Diagnosis

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During the United States anthrax attacks of 2001, patients' lives depended upon the astuteness of the clinician. The danger highlighted the need to enhance clinical detection and diagnostic accuracy of clinicians in case of a biological attack. Victims of a biological or chemical attack present to the healthcare system with a constellation of symptoms that often includes visual evidence of the exposure. The ability to differentiate between benign and life-threatening skin manifestations is critical. While skin disease is a frequent complaint affecting a large percentage of people, most physicians and nurses receive limited training in dermatology, and frequently, are not confident in their ability to diagnose and manage dermatological diseases. Diagnoses of rare diseases and their manifestations produced by bioterrorism that have non-specific early findings create even more challenges.

A computer-based Clinical Decision Support System (CDSS) refers to computer programs designed to assist clinicians in decision-making. VisualDx (Logical Images, Inc., Rochester, New York) is a CDSS designed to provide diagnostic support and referencing capabilities for the image-rich areas of medicine, including general dermatology, infectious diseases, drug reactions, and the results of bioterrorism. VisualDx allows searching the database using patient findings, cutaneous morphology, and rash distribution. Designed for emergency and public health clinicians, the system merges the world's largest collection of digitized images with textual information to guide diagnosis and treatment, including conditions caused by the use of weapons of mass destruction. VisualDx facilitates the early detection of diseases by providing instant access to the information needed to rapidly diagnose and begin treatment.

Keywords: bioterrorism; chemicals; cutaneous manifestations; database; diagnosis; exposure; images; VisualDx; weapons of mass destruction

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Long-term Environmental and Health Effects of Weapons with Depleted Uranium

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Weapons containing so-called depleted uranium (DU) were used first in the Gulf war in 1991, then in the Balkans, Afghanistan, and currently in Iraq. Simultaneously, there have been reports of unexpected increases in the incidence of malignancies and birth defects among veterans, their children, and civilians in the areas where these weapons have been deployed. While a score of other explanations have been suggested, like dust, pollution, vaccinations, post-traumatic stress disorder, and others, the one recurring and common factor for all those theaters of war has been DU.

DU is both chemically and radiologically toxic. It is a heavy metal with clear nephrotoxic properties, but it also emits alpha rays. One single atom of uranium₂₃₈ inside the

body can damage the adjacent cells and eventually cause cancer. The international states using DU arms certainly are not interested in having them banned by contravening international conventions. They question the evidence produced on the dangers inherent in DU for its long-term environmental and health effects including damaging the genetic code for generations to come. Not only have investigations into the biological and clinical consequences of DU been hindered, but the presentations of findings concerning such weapons also have been hindered as well.

This review summarizes the current knowledge gathered from field observations, follow-up studies, and laboratory experiments, including the testimonies at an international, scientific conference in Stockholm in April 2004. This presentation argues the case for deeper clinical and in-vitro studies, as well as for the immediate cessation of the use of DU weapons.

Keywords: depleted uranium (DU); environmental effects; health effects; weapons

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Late Respiratory Complications of Sulfur Mustard Poisoning in Iranian Veterans

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Introduction: Mustard gas, or sulfur mustard (SM), is an alkylating chemical warfare agent that was widely used during World War I and in the Iran-Iraq conflict. Delayed respiratory complications are the greatest cause of long-term disability among SM casualties.

Objective: To study late toxic effects of SM on the respiratory system of severely affected Iranian veterans.

Methods: Respiratory examination, spirometry, arterial blood gas (ABG) analysis, and high-resolution computed tomography (HRCT) of the chest were performed on all severely SM-poisoned veterans in the province of Khorasan, Iran. HRCT abnormalities were classified into four grades based on the number of lung lobes involved. ABG values were compared with spirometric results, as well as with the severity grades of HRCT abnormalities, using Spearman's rank correlation test.

Results: Forty male patients (mean age 43.8 ± 9.8 years) with confirmed SM poisoning 16–20 years previously were studied. Main respiratory complications were diagnosed as chronic obstructive pulmonary disease (35%), bronchiectasis (32.5%), asthma (25%), large airway narrowing (15%), pulmonary fibrosis (7.5%), and simple chronic bronchitis (5%). The overall pattern of spirometry was obstructive in 57.5%, restrictive in 22.5%, mixed in 15%, and normal in 5% of the patients. Mild, moderate, and severe hypoxemia was found in 67.5%, 27.5%, and 0% of the patients, respectively. While there was a significant correlation ($p < 0.05$) between ABG values and spirometric results, the severity grades of HRCT abnormalities revealed a significant correlation ($p < 0.05$) only with PaO₂ value.