# Abstracts

## 1. THE IMPORTANCE OF PARTICLE SIZE IN ESTIMATING DOWNWIND CONTAMINATION FROM AN RDD *(13)*

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There is general agreement that realistic quantities of radiological material released from a radiological dispersal device (RDD) will not travel more than a couple hundred meters at toxic levels. Of greater concern in the case of such an incident is the size of the area contaminated with radiological particles. Remediation of contaminated areas will require either removal of the deposited particles or disposal of the contaminated materials.

Contours of expected contaminated areas have been presented which extend more than 10 miles downwind of the release location. It would be impossible to remediate such a large area, so the likely response will be to permanently seal most of it off from further use. Not only are these radiation contours below levels of concern, the particle size assumed is unreasonably low, especially when the density of radioactive materials is considered. Using an appropriate RDD characterization and range of particle sizes, this presentation will show that expected contamination areas should be small enough to make remediation feasible.



## 2. EFFECTS OF CHEAP ANTIDOTES; SODIUM BICARBONATE AND MAGNESIUM SULFATE IN ORGANOPHOSPHOROUS POISONING *(3)*

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Organophosphorous (OP) compounds have been used as pesticides and chemical warfare nerve agents. Despite administration of well known antidotes (atropine and oximes), morbidity and mortality of OP poisoning were still high. Besides, oximes are very expensive and not available in most developing countries. It was thus aimed to study the effects of cheap available antidotes; sodium bicarbonate and magnesium sulfate in OP poisoning. In addition to the standard antidotal treatment, out of 117 patients (63M, 47F) aged 25.2 ± 9.5 years with moderate to severe acute OP pesticide poisoning 59 were given sodium bicarbonate 5 mEq/kg in 60 min. followed by 5-6 mEq/kg/day to obtain arterial blood pH of 7.45 to 7.55. Arterial blood pH increased significantly ($p<0.01$) to 7.48 ± 0.05 compared to the controls (7.32 ± 0.06). Morbidity based on hospitalization days reduced significantly ($p<0.05$) from 5.62 ± 3.4 in the controls to 3.1 ± 2.6 days in the sodium bicarbonate group. Total atropine dose was also significantly ($p<0.05$) lower in the test group. Mortality was lower, but not significantly due to the low numbers (5 and 2 of the controls and test group, respectively). Sodium bicarbonate appeared to be effective and could be added to the treatment regime of OP poisoning. Magnesium sulfate was administered four gram intravenously only for the first 24 hr of hospitalization day for the patients with moderate to severe OP poisoning in a pilot study. The results were promising and thus further investigations are continued.



## 3. IDENTIFICATIONS OF OPIUM AND HEROIN BODY PACKING BY MEDICAL IMAGING IN THE POISONED AND NON-POISONED DRUG SMUGGLER *(13)*

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Opium and heroin body packing is a social and health problem in Mashhad since the city is in the vicinity of Afghanistan border. We aimed to compare abdominal X-ray (AXR) and computed tomography (CT) scan for diagnosis. All body packers referred to the center between 2003 and 2006 were hospitalized. Defecation of packets was considered as the gold standard for diagnosis. AXR and CT scan results were classified into 3 groups (highly suggestive, suggestive, and false positive) and compared with each other, using Chi-Square test. A total of 56 body packers (54 M and 2 F) aged 32.1 ± 11.3 years were studied. A mean of 44.4 ± 35.1 opium and 52.0 ± 20.0 heroin packets weighed 8-15 g were retrieved from 46 and 10 patients, respectively. Mean period of hospitalization was 4.7 ± 2.7 and 4.1 ± 0.6 days for opium and heroin packers, respectively. Urine morphine test was positive in 82% of the patients. Nine patients underwent surgical operation and death occurred in only 3 opium packers. AXR and CT scan results were significantly different ($p<0.001$) in terms of highly suggestive (16 and 40), suggestive (36 and 1) and false negative (4 and 0), respectively. However, sensitivity of AXR and CT scan in diagnosis of body packing was determined as 92% and 100%, respectively. Although AXR is a simple and more available technique for the diagnosis of opium and heroin body packing, CT scan revealed more significant sensitive diagnostic tool and should be employed as the confirmatory method.



## 4. SMOKE INHALATION AND CYANIDE POISONING: 20+ YEARS OF THE PARIS EXPERIENCE *(3)*

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Hydroxocobalamin has been used as a cyanide poisoning antidote for many years in France.

It has recently been approved by the US FDA. In Paris, hydroxocobalamin is carried by the Brigade de Sapeurs Pompiers (Paris Fire Brigade) in mobile intensive care vehicles and has been administered empirically to victims of enclosed-space fire smoke inhalation who meet the criteria of having soot in the nose, mouth, or throat, any alteration in mental status or disturbance in consciousness, and especially if any degree of hypotension is present (BP </= 100 mmHg systolic). The administration of hydroxocobalamin at the scene was shown to be safe. Hydroxocobalamin has also been efficacious and safe in "pure" cyanide poisoning, as long as brain death has not already occurred. A "toxidrome" of cyanide poisoning has been developed in our institution in Paris, and its application can assist in making the diagnosis of this life-threatening poisoning which cannot be emergently diagnosed by currently-available laboratory methods.

**Key words**: Fire Smoke, Cyanide Poisoning, Toxic Terrorism, Hydroxocobalamin, Antidotes

## 5. CYANIDE TOXIDROME. A CLUSTER OF NONSPECIFIC SIGNS MAY BE A CLUE *(1)*

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### Introduction

One of the major concerns regarding a mass disaster is to clarify the involved class of toxicant. Hydrocyanic acid and its derivatives are considered a likelihood threat. However, cyanide-induced signs and symptoms are described as nonspecific, precluding any characterization at the scene. Chemical disaster may result in the exposure, at the same time, of a large number of casualties. In such a condition, not only the nature of signs and symptoms (qualitative knowledge), but also their frequency and magnitude of occurrence (quantitative knowledge) would be of value for a presumptive diagnosis. Therefore, we attempted at quantifying signs and symptoms of cyanide poisoning at the time of presentation in order to improve its recognition and, therefore, the rapidity of antidote supply.

### Methods

Cases of pure cyanide poisoning published in the medical literature and on which the authors consulted were reviewed. Smoke inhalations were excluded. Clinical data were collected before any antidotal treatment except for oxygen. Results are expressed as percentage or median [extremes]

### Results

Data on 149 acute pure cyanide poisonings described since 1950 were extracted and summarized. Cyanide poisonings primarily resulted from suicide attempts by ingestion. Median time between exposure and onset of symptoms was 30 minutes (1-1140). An abnormal odour was looked for in only 24 out of the 149 cases and was reported in 16 cases (67%). Acute cyanide poisoning was characterized by abnormal neurological status (82%) including coma (66%), dilated pupils (78%), and abnormal respiratory pattern (93%) including hyperpnea, polypnea, and bradypnea. Muscular tone was nonspecific. Seizures were witnessed in only 26% of poisonings, premature ventricular contractions in 16%, and pulmonary edema in 5%. Median heart rate was 95 bpm [0-176], and median systolic blood pressure was 90 mmHg [0-168]. Arterial pH was 7.20 [6.40-7.60], $PaCO_2$ was 25.2 mmHg [9-53.6], and plasma lactate was 13.4 mmol/l [2.4-53].The mortality rate was 28%. Median blood cyanide concentration was 4.2 mg/l [0.1-42.5].

### Conclusion

Easily collected signs at the scene by an emergency medical service are useful in recognizing cyanide poisoning allowing deciding prompt supply in antidote to cyanide.

## 6. COORDINATING INTERNATIONAL RESPONSE TO EMERGENCIES *(3)*

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Pandemic disease, natural disasters and terrorism can affect thousands of people in a relatively short period of time anywhere in the world. Our recent international experience with hurricanes, earthquakes, tsunamis and infectious diseases (AIDS, TB and highly pathogenic avian influenza) show us that we must respond with a coordinated approach or we will fail the very people we intend to help. Nations from around the world are often eager to send assistance to the site of a disaster, but coordinating the incoming aid is more often flawed and imprecise than it must be in order to save lives and mitigate suffering. How can any one country, suffering from a horrendous calamity coordinate the incoming aid from around the world? Can any one agency hope to coordinate the myriad nation's response let alone that of the hundreds of non-governmental organizations? Currently, the answer is sadly, no.

The purpose of this presentation is not to recommend one over the many international bodies which claim to oversee humanitarian assistance; the purpose of this presentation is to discuss the elements of only one aspect of the overall response effort: public health and medical response coordination.

Public health response is of course different than a purely medical response. Traditionally, in a natural disaster, immediate public health concerns center around water, sewerage/waste disposal, potential for disease outbreaks, etc, whereas medical response concentrates on triage, saving those who can be saved, patching up the injured, and to a lesser extent, primary care to the survivors. In order to avoid political controversy, this presentation will use the