CURRENT AWARENESS PAPERS OF THE MONTH

Position paper update: Whole bowel irrigation for gastrointestinal decontamination of overdose patients

Context
A position paper on the use of whole bowel irrigation (WBI) was first published in 1997 by the American Academy of Clinical Toxicology (AACT) and the European Association of Poisons Centres and Clinical Toxicologists (EAPCCT) and updated in 2004. The aims of this paper are to briefly summarize the content of the 2004 Position Paper and to present any new data and recommendations.

Methods
A systematic review of the literature from January 2003 to February 28, 2013 was conducted using multiple online databases for articles concerning WBI for gastrointestinal decontamination. An evidence table was created for applicable articles. The authors produced the initial draft that was reviewed by AACT and EAPCCT.
Results
The literature search produced 60 articles with the possibility of applicable human data. Based mainly on volunteer studies, WBI can be considered for potentially toxic ingestions of sustained-release or enteric-coated drugs particularly for those patients presenting later than 2 h after drug ingestion when activated charcoal is less effective. WBI can be considered for patients who have ingested substantial amounts of iron, lithium, or potassium as the morbidity is high and there is a lack of other potentially effective options for gastrointestinal decontamination. WBI can be considered for removal of ingested packets of illicit drugs in "body packers." However, controlled data documenting improvement in clinical outcome after WBI are lacking. WBI is contraindicated in patients with bowel obstruction, perforation, or ileus, and in patients with hemodynamic instability or compromised unprotected airways. WBI should be used cautiously in debilitated patients and in patients with medical conditions that might be further compromised by its use. The concurrent administration of activated charcoal and WBI might decrease the effectiveness of the charcoal. The clinical relevance of this interaction is uncertain.

Conclusion
WBI can facilitate removal of select toxicants from the gastrointestinal tract in some patients, but there is no convincing evidence from clinical studies that it improves the outcome of poisoned patients. There is no new evidence that would require a major revision of the conclusions of the 2004 position statement.

Full text available from: http://dx.doi.org/10.3109/15563650.2014.989326

Characteristics of analytically confirmed 3-MMC-related intoxications from the Swedish STRIDA project

Background
3-Methylmethcathinone (3-MMC) is a synthetic cathinone stimulant structurally related to the new psychoactive substance (NPS) mephedrone (4-methylmethcathinone, 4-MMC). We describe a case series of analytically confirmed intoxications involving 3-MMC presented to emergency departments in Sweden and included in the STRIDA project.

Study design
Observational case series of consecutive patients with self-reported or suspected use of NPS presenting to hospitals in Sweden between August 2012 and March 2014.

Methods
NPS analysis was performed by a liquid chromatography–mass spectrometry (MS)/MS method that is updated with new substances as they appear. Data on clinical features were collected during Poisons Information Centre consultations and retrieved from medical records.

Results
3-MMC was detected in 50 (6.4%) of the 786 cases included in the STRIDA project during the 20-month study period, with the peak occurring in August 2013. The age range of patients testing positive for 3-MMC was 17–49 years (median 24) and 76% of them were men. The 3-MMC concentration in serum ranged between 0.002 and 1.49 µg/mL (median, 0.091) and between 0.007 and 290 µg/mL (median, 3.05) in urine. Co-exposure to other NPS and/or traditional drugs was very common, and 3-MMC mono-intoxication was found in only 4 (8%) cases. The most frequent clinical features were tachycardia (48% of cases) and
agitation (42%). Other features included a reduced level of consciousness (32%), dilated pupils (24%), hallucinations (20%), diaphoresis (12%), seizures (8%), and hyperthermia (6%). Most patients (60%) needed hospital care for only 1 day but in 8% for 3 days or longer.

**Conclusion**
The majority of patients with analytically confirmed 3-MMC exposure had sympathomimetic features similar to those associated with mephedrone intoxication. However, the high incidence of co-exposure to other drugs makes the clinical interpretation difficult. Nevertheless, 3-MMC was associated with a high admittance rate to intensive care (30%), and detected in two cases with a fatal outcome, suggesting that 3-MMC is a harmful drug.

Full text available from: [http://dx.doi.org/10.3109/15563650.2014.981823](http://dx.doi.org/10.3109/15563650.2014.981823)

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**Understanding the availability, prevalence of use, desired effects, acute toxicity and dependence potential of the novel opioid MT-45**


**Introduction**
1-Cyclohexyl-4-(1,2-diphenylethyl)piperazine (MT-45) is a novel psychoactive substance available over the Internet. MT-45 is an opioid-like compound. This study provides an overview of availability, use and desired and unwanted effects of MT-45 through triangulation of available data sources.

**Methods**
Searches of the published scientific literature and 'grey' information sources, using the keywords 'MT 45', 'MT-45' and '1-cyclohexyl-4-(1,2-diphenylethyl)piperazine' were undertaken in June 2014 to identify information on the availability, prevalence of use and desired/unwanted effects of MT-45. In addition an Internet snapshot survey in English was undertaken in May 2014 to determine the availability and cost of MT-45.

**Results**
In June 2014 we were unable to identify any studies reporting the prevalence of use of MT-45. The Internet snapshot study identified 17 Internet sites selling MT-45. Information on price was available from 9 sites, with the mean price of MT-45 decreased with increasing purchase amounts from US$57.60 ± 19.37 per gram for a 1-g purchase to US$3.36 ± 1.83 per gram for a 1-kg purchase. We identified one published scientific paper reporting on the acute harms in nine cases of analytically confirmed MT-45 toxicity, one US government report relating to two MT-45-related deaths and 20 user reports on Internet discussion forums relating to the use of MT-45. All these suggest that the desired and unwanted effects of MT-45 are similar to those seen with other opioids, and that the opioid-like unwanted effects may be reversed with the opioid antagonist naloxone. There were user reports of MT-45 being used in heroin withdrawal and of 'withdrawal symptoms' after use, suggesting that long-term use may be associated with dependency as seen with other opioids.

**Conclusions**
Combining published scientific literature and 'grey' information sources, we have demonstrated that MT-45 has opioid-like desired and unwanted effects. Whilst the information is limited at the moment, it has the potential to have similar dependence liability to other opioids.

Full text available from: [http://dx.doi.org/10.3109/15563650.2014.983239](http://dx.doi.org/10.3109/15563650.2014.983239)
The pharmacotherapy for pit viper envenoming in the United States: a brief retrospective on roots, recurrence, and risk


Introduction

The report by Bush and colleagues ("Comparison of F(ab')\textsubscript{2} versus Fab antivenom (AV) for pit viper envenomation: A prospective, blinded, multicentre, randomized clinical trial") in this issue of Clinical Toxicology presents the results of a controlled Phase-3 study comparing the therapeutic efficiency of two Fab AVs, equine-derived F(ab')\textsubscript{2} and ovine-derived Fab (Fig. 1), for treating pit viper (crotaline) envenomation. The study was conducted at 18 clinical sites and included envenoming attributed to at least 12 identified crotaline species with the majority (102) of bites ascribed non-specifically as "rattlesnake" or "unidentified" bites. Most of the 114 patients ultimately included in the three study groups (F(ab')\textsubscript{2}/F(ab')\textsubscript{2}, F(ab')\textsubscript{2}/placebo, and Fab/Fab) exhibited characteristics reasonably representative of commonly encountered envenomed patients in the US, for example, predominantly white males with a median age between 32.9 and 45.6 years. Children aged less than 10 years, and mostly in the F(ab')\textsubscript{2}/F(ab')\textsubscript{2} group, were also included.

The study by Bush et al. (2014) provides encouraging support for the clinical efficiency of F(ab')\textsubscript{2} AV against North American pit viper venoms, as their study reports a notably lower percentage of patients who experienced late coagulopathy when respectively comparing the F(ab')\textsubscript{2}/placebo (5.3%) and F(ab')\textsubscript{2}/F(ab')\textsubscript{2} (10.3%) groups with the Fab/Fab (29.7%) group. Also, although the overall adverse event incidence was similar in the F(ab')\textsubscript{2}/F(ab')\textsubscript{2} and Fab/Fab groups, adverse events associated with coagulopathy or hemorrhage (e.g., petechiae and gingival bleeding) were reported in 8.1 – 9.3% of those in the F(ab')\textsubscript{2}/placebo and F(ab')\textsubscript{2}/F(ab')\textsubscript{2} groups in comparison to 24.4% in the Fab/Fab group. Of the nine patients who reportedly experienced serious adverse events, two-thirds were in the F(ab')\textsubscript{2}/F(ab')\textsubscript{2} group, but the authors indicate that all of these were not associated with the AVs, and provide several examples supporting their assertion. There were no reported life-threatening anaphylactic reactions in any of the groups.

Full text available from: http://dx.doi.org/10.3109/15563650.2014.983240

Gila monster (Heloderma suspectum) envenomation: descriptive analysis of calls to United States Poison Centers with focus on Arizona cases


Background

The Gila monster (Heloderma suspectum) is a venomous lizard native to the deserts of southwestern United States (US) and northern Mexico. The purpose of this study was to describe human exposures to Gila monsters reported to US poison control centers (PCCs) with a focus on Arizona cases.

Methods

The American Association of Poison Control Centers’ National Poison Data System (NPDS) was used to access and retrospectively review all calls to US PCCs, concerning Gila monsters between January 1, 2000 and October 31, 2011. In addition, detailed records from the two Arizona PCCs were reviewed for the same time period.
**Results**

A total of 319 calls regarding Gila monsters were identified in the NPDS. Of these, 105 (33%) were human exposures; most (79%) occurred in males. A total of 71 (68%) of these 105 cases were referred to a health care facility (HCF); 30 (29%) were managed on-site. Of the 71 HCF referrals, 36 (51%) were discharged home and 17 (24%) were admitted. Most (65%) admissions were to an intensive care unit (ICU). Arizona’s PCCs received 70 unique reports of Gila monster bite. Most (77%) of the bites in Arizona involved an upper extremity. Eight (11%) involved patients under the age of 18 years. Eleven (16%) Arizona cases were work-related. Twenty-eight (40%) of the 70 bites in Arizona were evaluated in a HCF, but not admitted. Eleven (16%) were admitted, of which five were to an ICU. Six patients had edema of airway structures; three required emergent airway management, one by cricothyrotomy. There were no deaths.

**Conclusion**

Gila monster bites are uncommon. Many cases did not require hospitalization. Edema of airway structures is an infrequent, but life-threatening complication.

Full text available from: [http://dx.doi.org/10.3109/15563650.2014.988791](http://dx.doi.org/10.3109/15563650.2014.988791)

Poisoning in the United States: 2012 emergency medicine report of the National Poison Data System


Abstract and full text available from: [http://dx.doi.org/10.1016/j.annemergmed.2014.11.001](http://dx.doi.org/10.1016/j.annemergmed.2014.11.001)

Rapid and equivalent systemic bioavailability of the antidotes HI-6 and dicobalt edetate via the intraosseous and intravenous routes

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Abstract and full text available from: [http://dx.doi.org/10.1136/emermed-2014-204171](http://dx.doi.org/10.1136/emermed-2014-204171)

Respiratory complications of organophosphorus nerve agent and insecticide poisoning – Implications for respiratory and critical care


Abstract and full text available from: [http://dx.doi.org/10.1164/rccm.201406-1150CI](http://dx.doi.org/10.1164/rccm.201406-1150CI)
**In vitro and in vivo toxicological studies of V nerve agents: molecular and stereoselective aspects**


Abstract and full text available from: [http://dx.doi.org/10.1016/j.toxlet.2014.11.010](http://dx.doi.org/10.1016/j.toxlet.2014.11.010)

**Neurological outcomes associated with low-level manganese exposure in an inception cohort of asymptomatic welding trainees**


**Prevalence of carbon monoxide poisoning in patients presenting to a large emergency department**


Abstract and full text available from: [http://dx.doi.org/10.1111/ijcp.12432](http://dx.doi.org/10.1111/ijcp.12432)

**Associations of respiratory symptoms and lung function with measured carbon monoxide concentrations among nonsmoking women exposed to household air pollution: the RESPIRE trial, Guatemala**


Abstract and full text available from: [http://dx.doi.org/10.1289/ehp.1408200](http://dx.doi.org/10.1289/ehp.1408200)

**Intravenous lipid emulsion therapy does not improve hypotension compared to sodium bicarbonate for tricyclic antidepressant toxicity: a randomized, controlled pilot study in a swine model**


Abstract and full text available from: [http://dx.doi.org/10.1111/acem.12513](http://dx.doi.org/10.1111/acem.12513)
Intraosseous versus intravenous infusion of hydroxocobalamin for the treatment of acute severe cyanide toxicity in a swine model
Abstract and full text available from: http://dx.doi.org/10.1111/acem.12518

Comparing electronic news media reports of potential bioterrorism-related incidents involving unknown white powder to reports received by the United States centers for disease control and prevention and the federal bureau of investigation: U.S.A., 2009–2011
Abstract and full text available from: http://dx.doi.org/10.1111/1556-4029.12608

Maternal lead exposure and risk of congenital heart defects occurrence in offspring
Abstract and full text available from: http://dx.doi.org/10.1016/j.reprotox.2014.11.002

Pregnancy outcomes in women with inflammatory bowel disease following exposure to thiopurines and antitumor necrosis factor drugs: a systematic review with meta-analysis
Abstract and full text available from: http://dx.doi.org/10.1177/0960327114550882
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Risk assessment


Suicide


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Antidotes Antivenom

Atropine

Cobinamide
**Chelating agents**

**DMPS**

**Fab fragments**

**Hydroxocobalamin**

**Hyperbaric oxygen therapy**

**Lipid emulsions**

**Sodium bicarbonate**

**Beta blockers**

**Clomethiazole**

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**Dexamphetamine**

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General


2,4-dinitrophenol


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Lisinopril


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Diclofenac

Ibuprofen

Opioids


Codeine

Diamorphine

Methadone

Tapentadol

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Paracetamol (acetaminophen)


**Paracetamol (acetaminophen)**

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**Chloroanilines**

**Corrosives**

**Cyanide**


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**Dioxin**

**E-cigarettes**
E-cigarettes


Ethylene glycol


Fluorocarbons

Hydrogen sulphide


Iodine

Kerosene

Latex

Mineral fibres

Parabens


Phenol


Phthalate esters
Phthalate esters
Ferguson KK, McElrath TF, Chen Y-H, Mukherjee B, Meeker JD.
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Sodium fluoride

Solvents

Surfactants

Tetrachlorodibenzo-p-dioxin

Tetrachloroethylene

Tobacco


Triclosan

Trihalomethane

Vinyl chloride

METALS
General


**METALS**

**General**


**Arsenic**


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**General**


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**General**


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General
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Regul Toxicol Pharmacol 2014; online early: doi: 10.1016/j.yrtph.2014.11.003:

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CHEMICAL WARFARE,
BIOLOGICAL WARFARE AND RIOT CONTROL AGENTS

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General
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Rapid and equivalent systemic bioavailability of the antidotes HI-6 and dicobalt edetate via the intraosseous and intravenous routes.

Wilhelm CM, Snider TH, Babin MC, Jett DA, Platoff GE, Jr., Yeung DT.
A comprehensive evaluation of the efficacy of leading oxime therapies in guinea pigs exposed to organophosphorus chemical warfare agents or pesticides.
Toxicol Appl Pharmacol 2014; online early: doi: 10.1016/j.taap.2014.10.009:

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Jowsey PA, Blain PG.
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Razavi SM, Negahban Z, Pirhosseinloo M, Razavi MS, Hadjati G, Salamati P.
Sulfur mustard effects on mental health and quality-of-life: a review.

Mechanistic insights of sulfur mustard-induced acute tracheal injury in rats.

Phosgene

Nerve agents
Chen S, Ruan Y, Brown JD, Hadad CM, Badjic JD.
The recognition characteristics of an adaptive vesicular assembly of amphiphilic baskets for selective detection and mitigation of toxic nerve agents.
J Am Chem Soc 2014; online early: doi: 10.1021/ja510477q:
**Nerve agents**


**PLANTS**

*Baptisia* spp. (*False indigo*)

*Camellia sinensis* (*Tea*)

*Hyoscyamus niger* (*Black henbane*)

*Mitragyna speciosa* (*Kratom*)

*Mushrooms*


*Amanita* mushrooms

*Poppy*

**ANIMALS**

*Fish/marine poisoning*


*Ciguatera*

*Pufferfish*

*Heloderma suspectum* (*Gila monster*)

*Scorpions*

*Snake bites*

*Coral snake*


*Colubridae*
Fernando WKBM, Kularatne SAM, Wathudura SPK, de Silva A, Mori A, Mahaulpatha D. First reported case of systemic envenoming by the Sri Lankan keelback (*Balanophis ceylonensis*). Toxicon 2015; 93: 20-3.

*Crotalinae* (*Pit vipers*)
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