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1. Communication Patterns for the Most Serious Poison Center Calls

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Introduction: There is an increasing focus on establishing competency in communication skills for all health care practitioners. Little is known about how specialists in poison information (SPIs) communicate to callers, particularly for the most at-risk cases. The objective of this study was to examine the communication patterns for potential high severity poison center cases.

Methods: Digitally recorded calls from 2008 were selected from a regional poison center database based on SPIs initial perception of the severity of the exposure. We adapted the Roter Interaction Analysis System (RIAS) and applied it to calls of moderate or major severity. The RIAS is a medical communication coding system in which the smallest phrase is coded into one of 48 discrete categories for each speaker (e.g., closed-ended psychosocial question). Results: A total of 988 calls were evaluated. The RIAS inter-rater reliability was excellent (r = .80). Patient age ranged from 1 month to 80 years, calls were predominately made by family members of the patient (63%), and 56% of exposures were unintentional in nature, 37% were intentional. On average, 42.7% of total call statements were made by callers. The majority (63.3%) of caller statements were devoted to providing information about the exposure. Only 4.0% of caller statements were devoted to asking questions and even fewer statements were devoted to expressing emotional concerns (1.3%). SPIs devoted 21.5% of their total talk to providing information and advising the caller about the poisoning. 22.3% of their talk was asking closed-ended questions and 3% was open-ended questions. Of interest, SPIs engaged in a significant proportion (18.8%) of talk devoted to establishing alliances with the caller and 3.4% of their communication reflected an attempt at empathic understanding alliances with the caller. 3.4% of their significant proportion (18.8%) of talk devoted to establishing open-ended questions. Of interest, SPIs engaged in a significant proportion (18.8%) of talk devoted to establishing alliances with the caller and 3.4% of their communication reflected an attempt at empathic understanding alliances with the caller.

Conclusions: Communication reflected an attempt at empathic understanding alliances with the caller and 3.4% of their significant proportion (18.8%) of talk devoted to establishing open-ended questions. Of interest, SPIs engaged in a significant proportion (18.8%) of talk devoted to establishing alliances with the caller and 3.4% of their significant proportion (18.8%) of talk devoted to establishing open-ended questions.

2. Does Your Charting Reflect the Actual Content of the Call?

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Background: Although our poison center has taped calls for over 15 years, we consider the legal record to be the written record. Call tapes are used by online staff for clarification of information and by management for training, quality assurance, and performance reviews. After three months, the taped records are overwritten. Since 2003, to ensure documentation accuracy, our center has been doing a tape to chart comparison review. Our goal is to ensure written documentation is an accurate reflection of the call, therefore eliminating any falsification of records. Method: Each month one chart from each online staff member is randomly selected for review. The notes section of the chart is evaluated and scored against the center’s guidelines for documentation. In addition, the documentation in the notes section is compared for accuracy to the coded clinical effect and therapy areas of the electronic record. After the documentation is reviewed, a tape of the call is evaluated against the center’s guidelines for call handling. Finally, the tape of the call is compared to the documented legal record. The evaluated chart is rated to staff for their review with inconsistencies highlighted. Although staff scoring less than fully proficient are reviewed more frequently until they have returned to a fully proficient level, only intentionally falsifying the case record results in corrective action.

Results: When the tape to chart review was initiated in 2003, only 13% of the charts were consistent. The most common inconsistencies were in gender, age units, species, and caller relationship. In 2008, almost 62% of the charts are consistent, the most common inconsistencies are gender, age units, species, caller relationship, and (due to the introduction of caller id) asking for or confirming the caller’s phone number. Unexpectedly, during this same period (2003 to 2008), overall documentation scores increased from 94.9% to 96.7% and overall tape review scores increased from 86.4% to 95.5%.

Conclusion: In addition to the increase in tape to chart consistency, we saw an improvement in call handling and the overall quality of documentation. The improved documentation was most noted in staff whose documentation had been marginal before.

3. The Value of Poison Center Data in Predicting Poisoning Trends

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Background: Reports of trends in unintentional poisoning deaths from a variety of dataset sources have all indicated increased poisoning deaths in the United States are mainly attributable to abuse or misuse of prescription opioid analgesics. None of these dataset sources included data reported from poison centers.

Unintentional poisoning trends may not accurately be reflected by the population studied in these datasets. The objective of our study is to compare our poison center’s data with the Oklahoma medical examiner’s data for the northeast region of our state.

Methods: The medical examiner reported all investigated fatalities in the selected region resulting from exposures to chemicals, drugs, or other toxins during 2008 to the Oklahoma Poison Control Center (OPCC). Autopsy reports excluding suicide as the manner of death were reviewed. OPC cases selected for review included all direct reports of human exposures treated in a healthcare facility (HCF) with fatal, major, or moderate outcomes. Suicide, maltreatment, or tampering cases were excluded. Medical examiner and OPC cases from the northeast region were compared.

Results: During the study period, 117 deaths were indirectly reported to the medical examiner. Most of the indirectly reported decedents were male, between 40 and 59 years of age, and died at their residences or shortly after transport to emergency HCFs. The cause of death was mainly attributable to prescription opioid analgesics. OPC cases meeting the study criteria totaled 169. Exposures were more evenly distributed by age and mainly attributable to stimulants/street drugs and sedative/hypnotics/antipsychotics.

Findings are summarized in Table 1: Conclusion: Collaboration between medical examiners and poison centers will yield a more accurate picture of poisoning trends.

Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Indirect Reports (n = 117)</th>
<th>OPCC Cases (n = 169)</th>
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<tr>
<td>Age</td>
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<td>Decades)</td>
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<td>13–19 yr</td>
<td>5.1%</td>
<td>13–19 yr: 15.4%</td>
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<td>20–29 yr</td>
<td>20–29 yr: 13.0%</td>
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<td>19.7% 30–39 yr</td>
<td>30–49 yr: 13.0%</td>
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<tr>
<td>18.5% 40–49 yr</td>
<td>50–59 yr: 13.0%</td>
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<tr>
<td>Sex</td>
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<tr>
<td>Male</td>
<td>63.3%</td>
<td>Male: 60.4%</td>
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<tr>
<td>Substance</td>
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<tr>
<td>Oxycodone</td>
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<td>Hydrocodone</td>
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<td>Methadone</td>
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<td>Fentanyl</td>
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<tr>
<td>Alprazolam</td>
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<td>Top (5)</td>
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<tr>
<td>Cocaine, MDMA, Amphetamines, Benzodiazepines, Atypical antipsychotics</td>
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4. A Novel Collaboration between a Regional Poison Center and State Medical Examiner

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Background: Collaboration between poison centers and medical examiners has not been frequently reported. In addition, concordance between medical examiner and poison center fatality reports has been poor.

Description: Since 2007, the medical and managing directors, fellows, and rotating trainees from the regional poison center (PC) have participated in a weekly “Difficult Case Conference” (DCC) with the medical staff, fellows, residents and rotating trainees of the state medical examiner’s office (ME).

Results: In 2008, a total of 142 cases were reviewed and 67 (47%) of those involved toxicological issues regarding cause and/or manner of death. Of the 67 cases requiring toxicologic interpretation, opioids were involved in 51%, ethanol in 37%, and sympathomimetic drugs in 4%. In 49% of cases involving toxicologic interpretation, multiple drugs were involved. As a result of discussions in DCC, 15 of the 67 cases (22%) were referred to the poison center for more in-depth analysis, and one case was further developed as a case report for publication.

Poinsoning fatalities in the ME database previously unknown to the PC have been added to the PC database to improve concordance and the accuracy of PC statistics. In addition, the PC-ME relationship has led to the development of forensic toxicology and poison center rotations for pharmacy toxicology fellows and pathology residents.
respectively, collaborative research projects and manuscript submissions, strengthened state legislative initiatives, and improved statewide toxico-surveillance efforts. We conducted a weekly combined telephone survey of all US poison centers (National Poison Data System) for rattlesnake bites from 2000 to 2007. Results: There were 9,581 total rattlesnake bites reported. The bites reported increased by 33.0% during the year study period. Rattlesnake bites were reported every month including the nadir in January (1.1%) and the peak in August (15.5%). Rattlesnake bites occurred in all but 5 states (AK, DE, HI, RI, VT), and 4 states (AZ, CA, FL, TX) accounted for approximately two-thirds of all bites. Two states (AZ and NM) had incidence rates greater than 30 bites/million population/year. Forty-five percent of the victims were adult (56.9%) and male (79.6%). Only 3.014 (31.4%; 95% CI: 30.5–32.4%) had no or minimal clinical effects (“dry bites”). Almost half (46.7%; 95% CI: 45.7–47.7%) of the victims had mild/moderate effects, and 75.7% (95% CI: 74.7–76.8%) had major effects. Poison centers were unable to record an outcome for 1,171 victims (12.2%). Sixteen victims died (0.17%; 95% CI: 0.10% to 0.27%) in 10 states. The major limitation of this study is the volunteer reporting of information to poison centers. Conclusion: This is the largest analysis of US rattlesnake bites. These results may be useful for snakebite prevention and the planning for snakebite management in each state.

6. Factors Associated with Failure To Achieve Initial Control with Fab Antivenom in Snakebite Patients

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1Rocky Mountain Poison & Drug Center-Denver Health, Denver, CO, USA; 2University of Colorado Denver School of Medicine, Aurora, CO, USA.

Background: The prescribing information for Crotalidae Polyvalent Immune Fab (FabAV) advises clinicians to administer FabAV until initial control (IC) of the envenomation syndrome is achieved. Risk factors for failure to achieve IC are not known. Objective: The study aim was to identify patient characteristics associated with failure to achieve IC. Methods: We conducted a retrospective study of all patients presenting to one of 17 centers and receiving FabAV from 2002–2004. Data about 9 specific venom effects were collected at specified time points. An expert panel used standard criteria to determine severity. We then compared characteristics that achieved IC against the group that did not by calculating odds ratios (OR) for dichotomous variables and using nonparametric comparisons of means for ordinal or continuous variables. An OR could not be calculated because of cells containing 0, then Fisher’s exact test was used. Factors with significant ORs were then used in a logistic regression model to calculate adjusted odds ratios. Results: The final analysis included 209 patients. Progressive swelling, pain, coagulopathy, cardiovascular and GI effects were not associated with failure to achieve IC. Mean INR, fibrinogen, and time to treatment did not differ significantly between groups. Thrombocytopenia, respiratory, neurologic symptoms, and severe bites were associated with IC failure and were used in our logistic regression model. Bleeding was significantly associated with failure to achieve IC, or venom effects that do not respond as well to FabAV treatment. Conclusion: Thrombocytopenia and the presence of neurologic effects independently predicted the failure to achieve IC.

7. Immediate Adverse Events (AEs) after Administration of Crotalidae Polyvalent Immune Fab (FabAV)

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1Rocky Mountain Poison & Drug Center-Denver Health, Denver, CO, USA; 2University of Colorado Denver School of Medicine, Aurora, CO, USA.

Background: FabAV is purified Fab immunoglobulin fragments used to treat North American pit viper envenomation. This study describes immediate AEs in a patient cohort treated with FabAV. Methods: This is a retrospective cohort study of all patients treated with FabAV from 2002 to 2004 at 17 sites. AE data were abstracted by site abstractors who determined occurrence of AEs and immediacy. An independent reviewer determined seriousness and relatedness. Results: 247 patients were treated with FabAV. Median age was 27 years, and 83.3% were male. 15 (6.1%) patients had immediate, 2 (0.8%) delayed, and 230 (93.1%) no AEs. Of the 15 patients with immediate AEs, 13 were mild/moderate envenomations, and 1 severe and 1 not classified. Patients received 4 to 19 vials of FabAV (mean 9). There was no difference in total number of vials between those with an AE (mean 9.9) and those without (11.5). There was no difference in proportions of immediate AEs in the mild/moderate envenomation groups (p = 0.70). Of 15 patients with immediate AEs, 12 had evaluable data and experienced 33 related AEs. 4 patients reported 11 serious AEs (hypotension 2, tongue swelling 2, lip swelling 1, angioedema 1, tracheal edema 1, chest discomfort 1, bronchospasm 1, wheezing 1, and shortness of breath 1). 12 patients reported 22 nonserious AEs (tachycardia 1, rash 4, pruritus 4, urticaria 3, erythema 1, swelling 1, hypotension 1, dizziness 1, headache 1, musculoskeletal pain 1, chills 1, cold feeling 1, nervousness 1 and tachypnea 1). There were no deaths, but one patient required cricoidotomy. Discussion: In prospective pre-marketing trials, 6/42 (14%) patients had immediate AEs. In our retrospective cohort the reported AE rate was 6.1%. AEs were not related to envenomation severity. Limitations: This is a retrospective study. Conclusions: Particularly non-serious, are underreported in retrospective studies. Conclusion: In this cohort immediate AEs were uncommon, largely nonserious, and occurred less frequently than in pre-marketing trials.

8. Digital Imaging: Consistency amongst Mycologists

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Background: Our poison center has classically relied upon descriptions provided by a health professional in a hospital or a member of the public to consulting mycologists in an attempt to identify a mushroom involved in an exposure. We have always been concerned about relying upon the ability of an untrained or inexperienced observer to describe the mushroom. Recently we request digital imaging to help improve reliability. This study was designed to determine the rate of agreement between toxic and non toxic species of mushrooms by a group of consulting mycologists based on digital images of selected mushrooms. Methods: The principal investigator prepared 25 sets of mushroom images from cases managed by our center. These images were e-mailed to participating mycologists who act as on call consultants to our center. They were asked to complete a mushroom identification table and e-mail it back to the investigator. Results: One hundred percent agreement was seen in 10 of the 25 sets of images. Of these, 3 were toxic. They included 2 Amanita species. 7 were considered non toxic, including a Stinkhorn. Each mycologist rated 7 out of 10 sets of images as good or better quality, 3 sets as poor quality. Eighty-three percent agreement was seen in 7 of the 25 sets of images returned. Of these, 4 were toxic including a Lepiota species. 3 were considered non toxic including an Amanita Vaginata. Each mycologist rated 4 of 7 sets of images as high quality, 3 sets as poor quality. 8 out of 25 sets of images had little agreement. All 8 sets of images were rated as poor quality. Discussion: Digital imaging allows the mycologist to focus on the mushroom itself without having to interpret a verbal description. A good quality image offers visible characteristics that an experienced mycologist can identify. A poor quality image can make differentiation difficult. Conclusion: The mycologists solidifies the important role digital imaging plays in regards to pcc management of mushroom exposure. Conclusion: Digital imaging is a tool that can enhance mushroom identification.

9. Medication Errors with the Antidotes Ethanol and Fomepizole

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Objectives: The purpose of this observational study was to describe the frequency, type and outcome of medication errors related to two antidotes for toxic alcohol poisoning, Fomepizole (FOM) and Ethanol (ETOH) and estimate the effect of antidote type on the occurrence of error. Methods: Cases were included if the patient was ≥13 years, hospitalized for toxic alcohol poisoning (identified by ICD-9 & 10 codes) between 1996 and 2005 and treated with ≥1 dose of ETOH or FOM. Charts from 10 hospitals were independently reviewed by 2 abstractors who recorded treatment and symptom details. A consensus panel of 1 pharmacist and 3 toxicologists used abstracted data to identify errors and classify error outcome as “no harm” or “harm” using the National Coordinating Council for Medication Error Reporting and Prevention index. “Any medication error” and “any harmful error” were the primary study outcomes. The adjusted odds ratio (OR) of error, determined by logistic regression, was used as a measure of the effect of antidote type. Results: The study included 145 cases who received ETOH and 44 who received FOM. Any medication error occurred in 113/ 145 (78%) ETOH and 20/44 (45%) FOM cases. After adjusting for poison control consultation and study year, the likelihood of error was 20% less for FOM treatment compared to ETOH (OR = 0.8; 95% confidence interval for any error 0.8 [0.3, 1.6] and any harmful error 0.8 [0.2, 2.4]). For both treatments, errors which delayed antidote start or delivered too low an initial dose of the antidote were more common in FOM than ETOH cases (Table). Conclusions: There is a modest advantage to fomepizole versus ethanol in reducing the likelihood of medication error.
11. Immunosuppressive Therapy in Patients with Paracetamol Poisoning in Vietnam

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Introduction: Paracetamol poisoning (PQP) is a potentially life-threatening event characterized by pulmonary fibrosis, multiple organ failure and death. We describe a cohort of PQP patients treated with pulsed methylprednisolone, dexamethasone and cyclophosphamide. Methods: We prospectively collected data on PQP patients presenting to NPCCV from 1/2004 to 8/2008. Data was collected on demographics, poisoning characteristics, treatment and outcome. Descriptive statistical analysis was performed. Results: 53 patients with PQP presented during the study time: mean age was 23.8 years with 50.9% males. 90.6% were suicidal ingestions and 9.4% were accidental pediatric exposures. Time from exposure to presentation was 1.9% in <6 hrs, 18.8% in 6–12 hrs and 79.3% in >12 hrs. The estimated doses were <10 ml in 50.9%, 10–20 ml in 47.2%, and >20 ml in 40.9%. Clinical manifestations are noted in the Table 1.

Leukocytosis and neutrophilia occurred in 83.6% and 77.5% of patients respectively. Acutely progressive pulmonary fibrosis and multiple organ failure were indicative of poor prognosis while smaller ingestions and early time to presentation appeared to be indicators of good prognosis. All patients received supportive care as well as methylprednisolone (15 mg/kg/day for 3 days), cyclophosphamide (15 mg/kg/day for 2 days) followed by dexamethasone (8 mg 3/day for 14 days). Discussion: Historical mortality from PQP has been described as 75%. In our cohort of patients treated with immunosuppressive therapy with supportive care mortality was 52.8%. Because our sample is small, further study is needed to evaluate treatments of PQP. Conclusions: Immunosuppressive therapy may be effective in reducing mortality in patients with PQP.

Table 1.

<table>
<thead>
<tr>
<th>Finding</th>
<th>Mortality</th>
<th>Caustic Burn</th>
<th>Nausea/Vomiting</th>
<th>Renal Failure</th>
<th>Hepatic Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finding</td>
<td>28 (52.8%)</td>
<td>52 (98.1%)</td>
<td>52 (98.1%)</td>
<td>32 (60.4%)</td>
<td>40 (75.5%)</td>
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</table>

*Each error category counted once per case.

12. Toxicoclimatic Comparison of Enteral and Intravenous Acetylcysteine in the Management of Acute Acetaminophen Poisoning

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Background: Acetaminophen poisoning is one of the most common exposures and causes of poisoning-related fatalities as reported to US poison information centers. Acetylcysteine is indicated for the antidotal treatment of acetaminophen poisoning to prevent or minimize acetaminophen-related hepatotoxicity. Available as either an enteral or intravenous formulation, both forms of acetylcysteine have been proven to be efficacious. Due to the differences in the acquisition costs and the length of treatment, it is unclear which treatment route is the most cost-effective. The purpose of this study was to compare the total hospitalization charges associated with patients who received either enteral or intravenous acetylcysteine therapy.

Methods: A retrospective, IRB approved, cohort study of patients treated with either enteral or intravenous acetylcysteine at a university-related hospital was conducted. Patients included were over 18 years of age, admitted during the five year periods of 1996–2000 (enteral) or 2004–2008 (intravenous), had an ICD-9 discharge diagnosis for acetaminophen overdose, no transplant history, and were admitted within 24 hours of the overdose. The primary endpoint was the total cost associated with the hospital stay. The Consumer Price Index inflation calculator from the US Bureau of Labor Statistics was used to adjust all dollars to 2008.

Results: Of a total of 528 patients, 317 met the inclusion criteria with 120 patients being treated with enteral acetylcysteine and 197 patients treated with intravenous acetylcysteine. The length of stay for the enteral group was 3.00 days and the intravenous group was 2.85 days. The average total cost per patient in the enteral group was $50,686, compared to $35,875 for the intravenous group. Conclusions: Patients who were treated with intravenous acetylcysteine had a decreased length of stay and cost of hospitalization compared to those patients who were treated with enteral acetylcysteine.
Abstracts

14. The Ethics of Reporting “Body Packers”
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Study objectives: To determine the perceptions and practices of physicians in the ethical care of adult body packers, we developed a survey to study of 50 emergency medicine physicians in a year.

We hypothesized that despite violating patient-physician confidentiality, physicians would report such individuals to LE. Methods: This was a prospective, observational study of 50 emergency medicine physicians (EM residency programs, and 10 toxicity fellowship programs. A standardized, 15-question survey instrument was used. The survey presented the definition of body-packing and assessed the perspectives of clinicians on various levels of training on reporting body-packers to LE. Results: Physicians from 50% of the enrolled sites responded. 35 alternate sites were randomly selected to replace programs that declined to participate. Amongst the responding sites, 321 physicians responded out of a potential 1508 (21.2%). All reported data is presented with 95% confidence intervals. 95.6% (94.9, 96.3) of respondents knew that a body-packer was 18.4% (14.3, 23.1) had treated one in the past. When asked: “Would you notify LE of the presence of a body packer in your ED?”, 37.2% (31.9, 42.8) responded “Yes”, 37.2% (31.9, 42.8) responded “No” and 25.6% (20.8, 30.7) were “Not sure.” Of the 118 subjects responding “No” to notifying LE, the most common reason (61%; 51.6, 69.9) was: “The individual was breaking the law.” Of the 118 physicians responding “No” to notifying LE, the most common reason (85.6%; 77.9, 91.4) was: “Violation of physician-patient confidentiality.”

Thirteen (4.0%; 2.2, 7.0%) subjects reported body packer present in their ED without a LE escort, 5 of whom reported this to LE. Conclusion: Despite violating physician-patient confidentiality, some physicians would report body-packers to LE. Physicians may find themselves with divergent obligations or responsibilities, instances where their duty to society might directly conflict with their obligation to their patient. The overriding principles of patient autonomy and privacy are in direct conflict with the concept of the “greater good” and illustrate the confusion and inconsistency that many feel when faced with conflicting values.

15. Unintended Consequences: Increasing Adolescent Opioid Use and Complications Following the 2000 JCAHO Pain Initiative
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Background: The 2000 Joint Commission on Accreditation of Healthcare Organizations (JCAHO) Pain Management standards led to increased opioid prescriptions. Adolescents are susceptible to prescription opioid misuse as they view them as easier to obtain, safer and less addictive than illicit drugs. This study’s objective was to determine if adolescent opioid usage and complications increased in the 7 years since the JCAHO pain initiative. Methods: A retrospective case review of the Indiana Poison Center (IPC) database for the years 1994-2007 identifying cases involving persons aged 12-18 with an opioid analgesic exposure. Two evaluators reviewed each case using a standardized, 95% CI were calculated using a Poisson regression model. Results: From 1994-2007 there were 1769 adolescent opioid cases; 216 cases had outcomes listed as major, severe or death. Compared to 0 in 1994-2000, there were 15 deaths in 2001-2007 (p = 0.013). Usage trends showed increases in hydrocodone (p = 0.038) and methadone (p < 0.001) and decreases in codeine (p < 0.001) and propoxyphene (p = 0.003) cases. Conclusions: An increase in the number and severity of IPC cases involving adolescents and prescription opioids has occurred in the 7 years following the JCAHO pain initiative. Adolescents have increased use of potent analgesics (methadone and hydrocodone) and decreased use of less potent analgesics (codeine and propoxyphene). This data can be used to target drug education and preventative strategies to adolescents.

16. Do Medical Examiners and Medical Toxicologists Agree on the Cause of Death?
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Background: Poisoning is the 2nd leading cause of injury-related death in the US. Epidemiologic studies rely on medical examiner (ME) assessment of poisoning related fatality (PRF), while clinical studies typically depend on medical toxicologist (MT) assessment. We tested agreement between the cause of death determined by the ME (death certificate) and an MT adjudication panel (MTAP) in cases of PRF. Methods: This retrospective 7-year cohort evaluated all deaths in one city attributed to poisoning. Data was obtained from death certificates, ME certificates, the Center for Disease Control electronic records. A cross-matched database included only PCC cases that were also evaluated by the ME. PRF was defined as: (1) ME cause of death based using ICD-10 codes for cases in 2001-1995 were 1.8 (CI 1.6, 2.0; p < 0.001) times more likely to have occurred and 3.1 (CI 2.2, 4.2; p < 0.001) times more likely to have outcomes listed as moderate, severe or death. Compared to 0 in 1994-2000, there were 15 deaths in 2001-2007 (p = 0.013). Usage trends showed increases in hydrocodone (p = 0.038) and methadone (p < 0.001) and decreases in codeine (p < 0.001) and propoxyphene (p = 0.003) cases. Conclusions: An increase in the number and severity of IPC cases involving adolescents and prescription opioids has occurred in the 7 years following the JCAHO pain initiative. Adolescents have increased use of potent analgesics (methadone and hydrocodone) and decreased use of less potent analgesics (codeine and propoxyphene). This data can be used to target drug education and preventative strategies to adolescents.

17. Epidemiology of Accidental Poisoning Caused by Storage of Non-Food Substances in Food Containers and Unmarked Bottles/Containers
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Background: Though our poison center has frequently observed poisoning from this mechanism, its epidemiology is not described in the US medical literature. Methods: CPCS records from 1998-2009 underwent search of free-text entries. Search terms included soda or Snapple bottle, glass, cup, unmarked bottle or container, or death. Only accidental ingestions occurring because the substance was not in its original container were included. Results: We identified 1,462 cases of accidental poisoning caused by storage of non-food substances in soda/Snapple bottles (627), unmarked bottles (358) or containers (303), cups (99) or glasses (64), or other (5). These resulted in 455 ED visits, 94 hospital admissions (52 ICU) and 8 fatalities. 831 cases developed either GI (772) or respiratory (107) symptoms. Average age was 24.7. Substances accidentally ingested were overwhelmingly cleaning products (67%), insecticides (32%), paint thinner (62), pine oil (54), depressers (52), hydro- peroxide (51), unknown (45), carpet shampoo (43), isopropanol (42) and insecticides (40) were the sub- strates identified. Poisoning was more common among persons who ingested the narrow tissue fixative in an unmarked bottle and an unknown clear liquid in a Coke bottle. Discussion: Our search strategy probably identified only a fraction of the cases reported to CPCS, but our very low absolute and relative risk attributable to a significant epidemiologic glimpse into this cause of accidental poisoning. These cases had a high rate of ED utilization (31%) and a mortality rate of 0.55%. (Overall, the annual mortality rate for poisonings reported to US poison control centers averages about 0.05% in NPS data.) Conclusion: Cases of accidental poisoning caused by storage of non-food substances in food containers are not rare. Serious morbidity and mortality can occur. Public education re: this preventable hazard is appropriate.

18. Health Seeking Behavior after Unintentional Poisoning in Greater Accra, Ghana
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Introduction: Poisoning is among the top three causes of injury worldwide, and developing countries share the highest mortality burden from poisoning. Specific risks for poor outcome are varied and complex. We report the results of a qualitative study designed to assess health-seeking behavior after poisoning in Greater Accra, Ghana, preliminary to developing a regionally appropriate public health interventions for poisoning of non-food substances in Greater Accra, Ghana. Methods: Semi-structured interviews were developed using a health belief model of behavioral change, and conducted with a convenience sample of 101 community members. Probing questions assessed understanding of the dangers associated with various readily available agents, susceptibility to unintentional poisoning in the home, barriers to safe storage, and self-efficacy for poison prevention. Specific questions in the probe series assessed first-aid responses and health-seeking behaviors in emergency situations related to poisonings. Results: Unintentional poisoning was the most common poisoning scenario described (36% of interviewees), followed by ethanol (3%). 47% of interviewees stated they would force emesis by immediate

19. Liver Aminotransferase Abnormalities Are Common with Rhabdomyolysis in the Absence of Significant Hepatic Injury

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Introduction: Rhabdomyolysis is an uncommon finding in the emergency department. However, the clinical implications of rhabdomyolysis are important, with a significant minority of patients developing acute renal failure and multi-organ failure. When present, the cause of elevated liver function tests (LFTs) in the setting of rhabdomyolysis is unclear. Study objective: We sought to determine the incidence of abnormal aminotransferase (ALT, AST) levels in the setting of rhabdomyolysis and how the LFTs decrease relative to the creatine phosphokinase (CPK) concentration as rhabdomyolysis resolves. Methods: A retrospective chart review of 215 cases of rhabdomyolysis with CPK ≥ 1,000 U/L was performed. Results: The incidence of an abnormal AST in the setting of rhabdomyolysis was 93.1%. An abnormal ALT was much less common and found in 75.0% of the cases with a CPK of ≥ 1,000 U/L (P < 0.002). All cases with an elevated AST also had an elevated ALT. In only one instance was the ALT > 40 U/L while the AST was < 40 U/L. Furthermore, AST concentrations (and not ALT) fell in parallel with CPK during the first 6 days of hospitalization for patients with rhabdomyolysis. Mean INR of all patients not on coumadin was 1.2 ± 0.8. Conclusion: LFT abnormalities, particularly AST, are common in the setting of rhabdomyolysis without significant hepatic injury. AST concentrations decrease in parallel to CPK, suggesting skeletal muscle may be a significant source of AST elevation in these patients.

20. In-Vitro Release of Fentanyl from Transfermal Patches in Gastric and Intestinal Fluid

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Background: While treatment of opioid toxicity is relatively straightforward, ingestion of fentanyl transfermal patches offers a unique mode of drug delivery with unknown drug release characteristics. Rapid and prolonged clinical compromise has been seen after patch ingestion. It is unclear whether release of fentanyl can occur without patch disruption. This represents the initial stages of research on the pharmacokinetics of fentanyl absorption following patch ingestion.

21. The Evolution of the Zip Code: From Streaming Mail Delivery to Decision Support and Surveillance

Spangler JA. University of Maryland School of Pharmacy-Maryland Poison Center, Baltimore, MD, USA.

Background: In the early 1960s, the United States Postal Service implemented Zip codes to facilitate mail delivery as mail volumes exploded in the US. Over the following years, Zip codes have come to be used for data reporting and analysis of public health information because it is easy to collect and offers a reasonable amount of anonymity. In many cases, it is the most specific geographic identifier collected. Issues can arise when analyzing and aggregating data collected by Zip codes because of conflicts between the intended use of the coding system and the actual uses that have evolved over the last 50 years. This paper will examine these conflicts and their impacts in the context of drug identification call data collected by the Maryland Poison Center from 2005-2008. Methods: Drug identification calls to the Maryland Poison Center were reviewed for inclusion of a valid Maryland Zip code. ZIP codes extracted from the data were used to facilitate the comparison of two Zip code datasets and the Zip Code Tabulation Areas (ZCTA) outlined by the US Census Bureau. Zip code and ZCTA datasets were compared to one another to assess the differences in geographic extent of the datasets and the ability to aggregate near and geographic data into standard reports based on county boundaries. Results: Nearly 87,000 drug identification calls were analyzed for the inclusion of a Maryland Zip code. Within Maryland, differences in geographic extent had significant impacts on reporting and analysis. The differences in extent complicate not only aggregation of call data for reporting on the county, state and national level, but also its comparison to Census summary data for analysis. Mitigating these impacts involve recording more specific geographic identifiers, such as address, as part of the call taking process. Conclusion: A number of challenges exist when reporting and analyzing data aggregated by Zip code because of its non-conformance to a hierarchical system, and its ever changing spatial and temporal definitions. These challenges introduce inaccuracy into reporting and analysis that must be carefully considered when attempting to portray the most accurate and true picture of a particular phenomena for decision support.

22. Evaluation of Severe Adverse Drug Reactions (ADR) Reported to 3 Poison Centers (PC)

Spiller HA,1 Griffith R,2 Aleguga A.3 1Indiana Regional Poison Control Center, Indianapolis, IN, USA; 2Kentucky Regional Poison Control Center, Louisville, KY, USA; 3Central Ohio Poison Center, Columbus, OH, USA.

Background: PC are often consulted for help in managing difficult, complex or non-routine cases, making centers potentially valuable sentinels for detection of ADRs. However PC generally report ADRs (if any report is made) as individual case reports or small focused cases series, underutilizing the toxicosurveillance potential of PC. Method: Retrospective chart review of all cases from three regional poison centers from years 2000-2007 with the reason as Adverse Drug Reaction and the medical outcome as either Major outcome or Death. Results: There were 159 major outcome ADRs and 15 fatalities, involving 100 separate drugs. Mean age of patients was 46 years, with a very broad range of 4 months to 96 years. ADRs were evenly distributed through the age groups with approximately 10% of cases per age decade. 89 patients (51%) were male. The most common categories were cardiovascular agents (n = 26), antidepressants (n = 25), antipsychotics (n = 23), Analgesics (n = 18), antimicrobials (n = 11) and herbal/alternative medicines (n = 9). The most frequent reported effects were confusion (n = 78), tachycardia (n = 62), hypotension (n = 59), renal dysfunction (n = 42), coma (n = 39), hypertension (n = 37), seizures (n = 36), hyperkalemia (n = 24), CPK elevation (n = 23) and bradycardia (n = 20). Discussion: PC recorded ADRs for a wide variety of drugs, across the entire age spectrum and involving clinically significant organ injury. PC served the dual role providing timely case management advice and well as recording the further surveillance of trends. Conclusion: Toxicosurveillance by PC should be organized and monitored using ADRs and may be an important source of information for regulatory authorities.

23. Lethal Blood Lead Level in a Child Treated Successfully with Succimer

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Background: The mainstay of chelation therapy for pediatric patients who are symptomatic or have blood lead levels (BLL) greater than 69μg/dl is calcium disodium ethylenediaminetetraacetic acid (CaNa2EDTA) and British Anti-Lewisite (BAL). Furthermore, 23-Dimercaptoproic acid (Succimer) is approved for treatment of lead-poisoned children but recommended only for asymptomatic children with levels between 45-69μg/dl. Case report: A 20-month-old female was seen in clinic for pallor, vomiting and episodic fever occurring during the previous week. She was also noted to have eaten paint chips over the last 2 weeks. Evaluation revealed a pale child with mild hypertension and a history of Glansmann’s Thrombocytopenia. A hemoglobin level was 59μg/dl and a BLL was 196μg/dl. The patient was immediately transferred to the emergency department. Vital signs were BP 140/90 HR 148, RR 32, Temperature 37.3 C. The child had no gastrointestional or neurological symptoms. Initial laboratory values included an iron level of 205μg/dl, normal
basic metabolic panel and liver transaminases, WBC 18,000 RBC 4.18, Hgb 5.6/gm/dl, Hct 20.4%, MCV 49, MCH 13.4, Platelets 514,000, Alk Phos 163, Albumin 4.3. An air efforts between poison control centers and schools throughout the small intestines. Whole bowel irrigation (WBI) was started at 500ml/hr. After 18 hours of WBI and persistent intestinal radiopaque material, treatment with 200mg of methane at 100mg twice a day and increased to 200mg every 8 hours on day 2. One unit of packed RBCs was given on day 2. The patient remained asymptomatic and was discharged on day 3 with a BBL of 94% (2L NC). He became progressively more tachycardia and confirmed that the patient remained asymptomatic. Conclusion: We report a case of WBI failure with a young boy, complications in children, and minimal symptoms successfully treated with Succimer. Long-term neuropsychological and cognitive effects cannot be predicted.

24. State Department of Health Utilization of Poison Control Network Hazardous Substance Data Forrester MB,1 Borders J,1 Samples-Ruiz M,1 Harris R,1 Borys DJ.2 1Texas Department of State Health Services, Austin, TX, USA; 2Central Texas Poison Center, Temple, TX, USA.

Background: There is currently interest in forging cooperation between poison control centers and state departments of health. The Texas Poison Center Network (TPCN) provides data to the Texas Department of State Health Services (DHSS) Hazardous Substance Emergency Events Surveillance (HSEES), which, in turn, performs surveillance of spills or releases of hazardous chemicals. Methods: In 2004, a system was designed allowing for the TPCN database to be linked to the DHSS HSEES database on a daily basis. In January 2006, HSEES began to test whether relevant cases could be identified in this replicated TPCN database.

Discussion: The screening criteria were human exposures with the exposure reason being unintentional environmental or occupational and the exposure site being the workplace. In March 2008, as a consequence of the Public Health Emergency Preparedness grant, a system was developed so that each time a case meeting the criteria was uploaded to the National Poison Data System, HSEES would automatically receive an email notification of the case. Results: During 2006–2008, 5,392 TPCN cases meeting screening criteria were identified. Of these, 77 were followed up by HSEES with TPCN serving as the sole reporting source for 75 of these cases. The chemicals most frequently involved in these cases were sodium hydroxide (13), chlorine (11), hydrofluoric acid (9), ammonia (5), phosphoric acid (5), and acetic acid (4).

25. School-Based Poison Education for Teen Parents Malheiro MC, Pace ST, Crouch BI. Utah Poison Control Center, Salt Lake City, UT, USA.

Background: Many poison prevention education programs in the community target parents of young children. Teen parents in secondary school may not be exposed to poison prevention education programs. Many public school districts have educational programs specifically for teen mothers. This is an ideal setting to deliver poison prevention education. The objective of this project was to develop poison prevention education tools specifically for teen mothers. Methods: A needs assessment was conducted to develop the poison prevention curriculum and identify level of interest in new or enhanced poison prevention curriculum. A formal lesson plan was developed based on the needs assessment and literature review. A slide presentation, handouts, and interactive activities were created. The program facilitator was instructed to follow the lesson plan instructions exactly and note any deficiencies. An identification test and post-test were also included to assess knowledge. Results: The teachers reported that the lesson plan provided an overview of potential poison prevention information to a potential at-risk population. Based on the results of the pre/post-tests, students gained valuable knowledge during the training. Conclusion: This intervention increased awareness of their knowledge of poison prevention and strategies to reduce potential poisonings. Conclusions: Many schools offer programs specifically for teen parents which provides a unique opportunity for poison prevention education.

26. Hemodialysis for Acute Salicylate Poisoning—How Much Is Enough? Minns AB,1,2 Cantrell FL,1 Clark RF.1 1UCSD, San Diego, CA, USA; 2Veterans Administration, La Jolla, CA, USA.

Background: Salicylate poisoning remains a common problem with appreciable morbidity and mortality. Severe salicylate poisoning can be life threatening, and aggressive treatment is required to reduce absorption and distribution as well as hasten elimination. We present the case of a patient with a large, acute aspirin ingestion who expired despite treatment with hemodialysis. Case report: A 35-year-old male arrived at the ED 7.5 hours after ingesting 400 tablets of aspirin (375mg each). His temperature was 98.6°F, BP 122/64, HR 168, RR 43, and oxygen saturation of 99% on RA. His initial salicylate concentration was 99.6 mg/dL. His repeat salicylate was 99.6 mg/dL at 4-hr line). His initial creatinine concentration was 3.9 mg/dL. A second run of hemodialysis was initiated at 100mg twice a day and increased to 200mg every 8 hours on day 2. One unit of packed RBCs was given on day 2. The patient remained asymptomatic and was discharged on day 5 with a BLL of 94% (2L NC). He became progressively more tachycardia and confirmed that the patient remained asymptomatic. Conclusion: We report a case of WBI failure with a young boy, complications in children, and minimal symptoms successfully treated with Succimer. Long-term neuropsychological and cognitive effects cannot be predicted.

27. Bradycardia and Prolonged Sedation Following Pediatric Ingestion of Renuzit® Pearl Scents Beads Goeppert SL, Schagelion JM. Drug and Poison Information Center of Cincinnati, Cincinnati, OH, USA.

Background: Toxic effects from emissions of volatile organic compounds from air fresheners have been demonstrated in a number of experiments, but no cases of pediatric ingestion with slow release of air freshener content resulting in prolonged symptoms has been described in the literature. We report a case of prolonged sedation and bradycardia due to ingestion of essential oil containing fragrance beads in a child. Case report: A 2-year-old female was brought into an emergency department following 2 days of decreased talkativeness and persistent lethargy. Upon questioning the child admitted to ingestion of some fragrance beads. She was admitted to the hospital overnight, and the poison control center (PCC) was contacted the next day due to persistent sedation and bradycardia (HR = 88bpmin). The product ingested was identified as Renuzit® pearl scents air freshener beads, and up to 20 beads had been ingested. After consultation with the PCC Toxicologist, an abdominal film was ordered that revealed 4 radio-opaque beads of the same size as the ingested product, 3 in the secum, and 1 in the rectal portion of the intestines. The recommendation was to administer GoLYTELY® to the patient as tolerated and initiated within 6 hours of consultation. No evidence of intact fragrance beads were recovered in the effluent and the patient returned to baseline within the next 24 hours. Case discussion: The product toxicologist for the Renuzit® Company revealed that the fragrance bead liquid composition consisted of 85% water with a proprietary mix of ethyl alcohol, alcohol ethoxylation, monoamine oxides, and perfume oils surrounded by an acrylic polymer shell. The product was designed to resist rapid emission of the essential oil content, with slow release of volatile organic compounds into the air as an air freshener. It was suspected that the slow emission design of the fragrance beads led to slower release of the volatile organic compounds after ingestion, leading to the prolonged sedation and bradycardia. Conclusion: Air freshener products designed for a slow release volatile emission, ingested in large enough quantity, may lead to prolonged central nervous system and cardiovascular effects necessitating medical intervention.

28. Changes in Risk Stratification on the Modified Rumack-Matthew Nomogram Following Acute Acetaminophen Overdose Dougherty PP, Klein-Schwartz W. Maryland Poison Center, University of Maryland School of Pharmacy, Baltimore, MD, USA.

Background: The Rumack-Matthew nomogram is used to predict hepatotoxicity risk in acute acetaminophen (APAP) overdose based on a single plasma acetaminophen concentration (PAC) at ≥ 4 hours. The objectives were to determine how often risk stratification increases to a higher group based on subsequent PACs and whether product formulation impacted risk stratification change. Methods: A retrospective review of acute APAP overdoses reported to a poison center over a 3 year period was conducted. Inclusion criteria consisted of at least one plottable PAC on or above the treatment line on a modified nomogram. A subset of these patients with ≥ 2 plottable PACs was identified. Line crossers were patients with an increase in risk stratification group on the nomogram based on subsequent PACs (≥ 2 plottable PACs). Groups were 0 (below treatment line), 1 (between 2 lower lines), 2 (≥200 mcg/mL & ≤300 mcg/mL at 4-hr line), and 3 (≥300 mcg/mL at 4-hr line). Risk stratification was measured by plottable PAC concentration (release, combination and administration of activated charcoal were determined. Results: There were 289 cases that met inclusion criteria, of which 88 (30%) had ≥ 2 plottable PACs. In the 0 group, 12 group 1, 82 group 2 and 90 group 3. Risk stratification level increased in 26 cases. Twelve patients
changed from group 0 (non-toxic) to groups 1 (n = 8), 2 (n = 2) or 3 (n = 1). Three patients changed from group 1 to groups 2 (n = 2) or 3 (n = 1). Eleven patients changed from group 0 to group 3. Eleven patients who changed to group 0 or to another group were identified by ingestion of 14/26 line crossers and 29/62 non-line crossers. Activated charcoal was adminis- tered to 18/26 line crossers. Of note, 8 of 12 line crossers who were initially in group 0 ingested combination products. Discussion: Increases in risk stratification occurred in 9% of all cases and 30% of patients with 2 ≥ 2 pivotal PAs. Almost half of the line crossers to group 0 PAs, but mi-

29. Accidental Administration of Adult Dose Oxytocin to a Newborn
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Background: Oxytocin is a xenobiotic that increases intracellular calcium concentrations, and is often administered in large doses. There is a low risk of maternal and/or fetal side effects. There is one published case report of an accidental intramuscular administration of oxytocin to a newborn infant resulting in transient apnea, bradycardia, and hypotension. No significant adverse events were noted. In the second case a newborn infant was given 10U intramuscular oxytocin in the first hour of life. This time the oxytocin was mistaken for vitamin K. The child did well, and throughout the hospital stay the electrolytes and vital signs remained within normal limits. In these cases the children did develop adverse effects and one child expired. In each of these 4 cases the oxytocin was mistaken for vitamin K. There are also published cases of neonates developing adverse effects after pre-delivery administration of oxytocin to the mother. Conclusion: The published reports of accidental administration of oxytocin, as a single or combination agent, to neonates due to its known side effects are to be expected. Our cases, how-

31. A Fifteen-Fold Edrophonium Overdose
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Introduction: Edrophonium chloride is a reversible acetylcholinesterase inhibitor primarily used in the diagnosis of myasthenia gravis. Toxicity from therapeu-
tic doses of edrophonium has been reported for decades; however, no case report of human overdose exists. We report a case of a patient with uncontrolled myasthenia gravis who accidentally received a 150 mg dose of edrophonium. The patient showed no improvement in dysphagia and was assessed as being on the cusp of respiratory failure.

Discussion: The patient was a 68-year-old female, who was scheduled for an edrophonium (Enlon® 75, Tension®) test to confirm the diagnosis of myasthenia gravis. The patient was to receive 2 mg of edrophonium chloride, an initial dose and another 8 mg, to reach a total of 10 mg. The patient accidentally received 20 mg as an initial dose. When the patient showed no improvement in dysphagia and other symptoms, the remainder of the via injection was administered. The patient was assessed as being on the cusp of respiratory failure and was assigned a total 150 mg dose of edrophonium chloride delivered IV within 1 minute. Immediately after the second dose, the patient complained of difficulty breathing and suffered a respiratory arrest. Atropine 1 mg IV was given result-

ing in a successful resuscitation. No hypertensation was noted. The patient awoke, followed commands, and had heart rate accelerated to 150’s bpm. Within minutes, apnea, bradycardia, and loss of pulse recurrently, but responded to epinephrine and atropine. Because of dia-
cardiopulmonary instability, she was endotracheally intu-
bated. Approximately 20 hours post exposure, she was extubated and remained alert and neurologically intact. Vital signs were normal except for mild hypertension with BP = 147/64 mmHg. Discussion: Edrophonium chloride is a reversible acetylcholinesterase inhibitor, and there have been reported cases of transient apnea, bradycardia, and respiratory arrest at therapeutic doses. The patient was not experiencing myasthenia gravis, and had not been exposed to ca
drugs or alcohol. The case report was presented at the Midwinter meeting of the American College of Medical Toxicology.

Conclusion: Edrophonium chloride is a reversible acetylcholinesterase inhibitor, and there have been reported cases of transient apnea, bradycardia, and respiratory arrest at therapeutic doses. The patient was not experiencing myasthenia gravis, and had not been exposed to ca
drugs or alcohol. The case report was presented at the Midwinter meeting of the American College of Medical Toxicology.
were managed at home. Of the 3 adults (27%) and 5 children (50%) evaluated at a healthcare facility, one child and one adult were managed at home. Of the 3 adults (27%) and 5 children (50%) evaluated at a healthcare facility, one child and one adult were admitted to the hospital and were discharged within 24 hours. Conclusions: Patients exposed to varenicline develop mild symptoms. Additional study is needed to determine toxicity thresholds for this drug.

34. The Use of Modern Photographic Technology for Animal Identification
Pruchnicki SA, Baker SD, Jolliff HA. Central Ohio Poison Center, Nationwide Children’s Hospital, Columbus, OH, USA.

Background: Product, substance, plant, or animal identification can be challenging for even the most seasoned specialist. We present a case where a caller used her cell-lular phone to photograph the offending animal (snake) and then email the picture to the specialist from her cell-lular phone. Since it is part of our medical management, our suspicion of the snake’s identification was confirmed with the provided photographic evidence. Case report: A 4 year-old male child was playing with a “medium size copper colored snake” which had bitten him once on a finger. The specialist receiving the call attempted to rule out the possibility of a Northern Copperhead envenomation which is common in our call area. Since the snake was still in the near the child, a photograph was taken with the caller’s cell phone and emailed to the specialist from her cell phone. A herpetologist at our local zoo who consulted on the case said it was a non-poisonous Eastern Milk Snake. These photos were then forwarded to a herpetologist at our local zoo who confirmed our identification. Case discussion: Although the risk of a serious or fatal outcome in this example is remote, this does not discount the potential of using this type of common technology to aid in the telephone management of many types of poisonous exposures. In some cases, correct substance identification could significantly affect patient outcome. This concept can be extrapolated to other substances such as product labels, tablet identification, and even large scale events such as hazardous materials operations where placards on vehicles or storage facilities need to be correctly identified. Callers could even take a picture of dermal symptoms to supplement the verbal history. Conclusions: One of the most challenging facets of telephone medical management is the correct understanding of exactly what substances poison information specialists are trying to identify. Using common technology such as camera phones with internet access, the poison information specialist has another tool to ensure correct substance identification and case management.

35. Naloxone in Cardiac Arrest with Suspected Opioid Overdoses

Introduction: Naloxone’s use in cardiac arrest has been of recent interest, stimulated by conflicting results in both animal and human studies and anecdot al accounts describing antiarrhythmic and positive inotropic effects. We hypothesized that naloxone administration during cardiac arrest, in suspected opioid overdosed patients, is associated with conversion to a cardiac rhythm more likely to result in tissue perfusion. Methods: From a database of 32,544 advanced life support (ALS) emergency medical calls, between January 2003 until December 2007, a retrospective chart review was completed of patients receiving naloxone in cardiac arrest. Forty-two patients in non-traumatic cardiac arrest were identified. Each patient received naloxone immediately after identifying potential use. Results: Eleven of the 36 (31%) patients in cardiac arrest who received naloxone in the pre-hospital setting had an improvement in EKG rhythm. Of the participants who responded to naloxone (14% of all study subjects) demonstrated EKG rhythm changes immediately following the administration of naloxone. Discussion: We support the supposition that the animal in question was a non- poisonous Eastern Milk Snake. The specialist receiving the call attempted to rule out the possibility of a Northern Copperhead envenomation which is common in our call area. Since the snake was still in the area near the child, a photograph was taken with the caller’s cell phone and emailed to the specialist from her cell phone. A herpetologist at our local zoo who confirmed our identification. Case discussion: Although the risk of a serious or fatal outcome in this example is remote, this does not discount the potential of using this type of common technology to aid in the telephone management of many types of poisonous exposures. In some cases, correct substance identification could significantly affect patient outcome. This concept can be extrapolated to other substances such as product labels, tablet identification, and even large scale events such as hazardous materials operations where placards on vehicles or storage facilities need to be correctly identified. Callers could even take a picture of dermal symptoms to supplement the verbal history. Conclusions: One of the most challenging facets of telephone medical management is the correct understanding of exactly what substances poison information specialists are trying to identify. Using common technology such as camera phones with internet access, the poison information specialist has another tool to ensure correct substance identification and case management.


Objective: Pharmaceutical manufacturers recommend refrigerating Succinylcholine at a temperature range of 2-8°C With widespread use of prehospital Succinylcholine on ambulances of varying temperatures, there is increasing importance in maintaining drug stability and removing it from ambulances at proper times which may be prior to expiration dates. We determined time period of 10% degradation, as deemed not appropriate for human injection by the FDA, using Mass Spectrometry. Various studies have stated that vials are stable for up to 30 days at room temperature without significant decomposition. Our study investigates the degradation of Succinylcholine parent compound before and after its exposure to fluctuations of temperatures while removing light exposure. Methods: The study used seven vials of Succinylcholine sealed with duct tape and light resistant bags. These bags were placed in a climate controlled medication compartments in the ambulances at our University Based Level 1 Trauma Center. One Succinylcholine vial was used as a control and kept at the recommended temperature range of 2-8°C Mass spectrometry was implemented On the 1st and 14th day and every four weeks up to six months. Results: Using mass spectrometry, degradation products of Choline and Monocholine are present at 0 days indicating immediately fragments being formed when placed in the vial. Ten percent degradation with fragment formation occurs at 90 days. Temperature variation in the ambient climate controlled compartment the use of Succinylcholine during cardiac arrest 53% delaying any suspicion of opioid use. With current low rates of survival and low return of spontaneous circulation during cardiac arrest, any potential improvement in rhythm makes this a reasonable modality.

37. Isopropanol Treatment of Ethylene Glycol Poisoning: Erroneous, but Successful
Hurlwy WT, Elko CJ, Yamamoto RI. Washington Poison Center, Seattle, WA, USA. Background: Controlled gastrointestinal delivery systems are non-digestible pill-shaped containers using a variety of technologies, none are tested. An experimental study of a novel polymers are being developed. Concurrently with the initial studies, we had developed progress ive Q prolongation, proarrhythmic cardiac arrest, and death 36 hours after admission (46 hours after ingestion). On autopsy, 30 intact “tablets” remained in his stomach. Postmortem Bupropion levels were 27 mg/dL, but otherwise stable, with normal vital signs. Fomepizole was unavailable and treatment with an ethan ol intravenous infusion recommended. Blood samples were sent to another hospital laboratory for measurement of an ethylene glycol level. The patient developed significantly decreased mental status, but continued to have good airway control and normal vital signs. Serial sodium levels were done for meta bolic acidosis. The initial ethylene glycol level was 52 mg/dL, but the ethanol level was < 10 mg/dL with the infusion running. An increase in the ethanol infusion rate and a decrease in the ethylene glycol level 3 hours post infusion was recommended. Recommendations were made to ensure the ethanol drip was infusing and to ensure it was the 10% concentration used in the provided calcula tion. About 12 hours into the treatment, the treating physi cian discovered that the hospital pharmacy had been unable to obtain medicinal ethanol and had prepared the infusion with isopropanol. The isopropanol infusion was stopped and a norepinephrine drip was adminis tered. Serial ethylene glycol levels were obtained until it became 14 mg/dL about 32 hours after the ingestion. The patient had progressive improvement in his mental status and was transferred to an inpatient psychiatric facility about 48 hours after ingestion. Clinical implications: Isopropanol has high affinity for ADH. We could find no other cases of its use in ethylene glycol or methanol poisoning, but it could serve as an alternative ADH blocker if ethanol and fomepizole are unavailable. Significant decreased mental status should be anticipated with its use.

38. Fatal Overdose of Bupropion Controlled Gastrointestinal Delivery System; Not Tablets or Capsules Anymore!
Hurlwy WT, Elko CJ, Yamamoto RI. Washington Poison Center, Seattle, WA, USA. Background: Controlled gastrointestinal delivery systems are non-digestible pill-shaped containers using a variety of technologies, none are tested. An experimental study of a novel polymers are being developed. Concurrently with the initial studies, we had developed progressive Q prolongation, proarrhythmic cardiac arrest, and death 36 hours after admission (46 hours after ingestion). On autopsy, 30 intact “tablets” remained in his stomach. Postmortem Bupropion levels were 27 mg/dL, but otherwise stable, with normal vital signs. Fomepizole was unavailable and treatment with an ethanol intravenous infusion recommended. Blood samples were sent to another hospital laboratory for measurement of an ethylene glycol level. The patient developed significantly decreased mental status, but continued to have good airway control and normal vital signs. Serial sodium levels were done for metabolic acidosis. The initial ethylene glycol level was 52 mg/dL, but the ethanol level was < 10 mg/dL with the infusion running. An increase in the ethanol infusion rate and a decrease in the ethylene glycol level 3 hours post infusion was recommended. Recommendations were made to ensure the ethanol drip was infusing and to ensure it was the 10% concentration used in the provided calculation. About 12 hours into the treatment, the treating physician discovered that the hospital pharmacy had been unable to obtain medicinal ethanol and had prepared the infusion with isopropanol. The isopropanol infusion was stopped and a norepinephrine drip was administered. Serial ethylene glycol levels were obtained until it became 14 mg/dL about 32 hours after the ingestion. The patient had progressive improvement in his mental status and was transferred to an inpatient psychiatric facility about 48 hours after ingestion. Clinical implications: Isopropanol has high affinity for ADH. We could find no other cases of its use in ethylene glycol or methanol poisoning, but it could serve as an alternative ADH blocker if ethanol and fomepizole are unavailable. Significant decreased mental status should be anticipated with its use.

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Abstracts

Characteristics of patients by rhythm changes

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Responders (11)</th>
<th>Non-Responders (25)</th>
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<tbody>
<tr>
<td>Age (Years)</td>
<td>46</td>
<td>40</td>
</tr>
<tr>
<td>% Male</td>
<td>55</td>
<td>76</td>
</tr>
<tr>
<td>Drug Dose</td>
<td>2.2</td>
<td>2.3</td>
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<tr>
<td>Initial Rhythm</td>
<td></td>
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<tr>
<td>Asystole</td>
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<td>60</td>
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<tr>
<td>PEA</td>
<td>27</td>
<td>36</td>
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<tr>
<td>Fifth</td>
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</table>

Ethylene Glycol Metabolism on Isopropanol

Time Since Ingestion | Ethylene Glycol Level | mg/dL
<table>
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<tbody>
<tr>
<td>1 hour</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>16 hours</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>32 hours</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>
Agents in controlled gastrointestinal delivery systems

Delivery System  | Agent  | Specific Preparation
--- | --- | ---
SmartCoatTM  | Bupropion  | Wellbutrin XL®
SmartCoatTM  | Metformin  | Glumetza®
SmartCoatTM  | Tramadol  | Ultram® ER
ORS®  | Chlorpheniramine  | Effexor®
ORS®  | Glipizide  | Glucotrol XL®
ORS®  | Hydroxyzine  | hydroxyzine
ORS®  | Methylphenidate  | Concerta®
ORS®  | Nifedipine  | Adalat® CR
ORS®  | Paliperidone  | Invega®

Not a comprehensive list of systems, agents, or preparations available and being developed. Manufacturers are partnering with pharmaceutical companies to provide personal and generic agents in controlled gastrointestinal delivery systems. Consistent nomenclature needs developed.

39. PCC Public Education and Home Gastric Decontamination Trends

Ward-Fowler L.1
1Oregon Health & Science University, Portland, OR, USA; “Oregon Poison Center, Portland, OR, USA.

Background and history: In 1965, syrup of ipecac (SI) was approved by the FDA as an OTC product for emergency poison treatment, and for many years was the mainstay of home gastric decontamination. Activated charcoal (AC) has been utilized much less in the home, reserved mainly for health care settings. For 2003, a FDA Advisory Committee discussed whether SI should retain its OTC status; the outcome was that it remained OTC. The FDA has revisited this issue, but no changes have been made. In 2003, the American Academy of Pediatrics (AAP) issued a policy statement that SI should “no longer be used routinely as a home treatment strategy.” The AAPCC guideline adopted in 2005 states “the circumstances in which ipecac-induced emesis is appropriate are rare.” Over the last six years, there has been a significant controversy over whether to recommend either SI or AC for home use. PCC public educators used to advise all parents to keep SI on hand, less commonly AC. This study looks at trends in PCC’s recommendations for home gastric decontamination in the period since the FDA, AAP and AAPCC guidelines were issued. Method: US and Canadian PCC public educators were surveyed in 2003 and 2009 to determine trends in PCC educators’ advice after the FDA, AAP and AAPCC statements were asked. They were asked if their PCC educators were surveyed in 2003 and 2009 to determine trends in PCC educators’ advice after the FDA, AAP and AAPCC guidelines were issued.

3.5 3 11.2 2 13.2

Conclusion: Increased use of AC and decreased use of SI over the last six years has been found that between 2003 and 2009, PCCs decreased their use of home gastric decontamination.

40. PCC Management: Using PI Ps and Technology to Maximize Efficiency

DeLauriers CA, Wang SS, Cervantes V.1,2 Illinois Poison Center, Chicago, IL, USA.

Background: The limited budgets and unique nature of PCCs as telemedicine consultants present challenges to PCC managers with regards to staff scheduling and balanced workload. Call and exposure (exp) volume are not comprehensive productivity measures due to the wide range of cases. Phone calls range from short general public info calls requiring limited documentation and no f/u, to critically ill multi-substance ingestions from HCFs, which involve research, lengthy documentation and numerous f/u. Staff who manage PCC calls are either Specialists in Poison Information (SPIs) or Poison Information Providers (PIPs). All SPIs are health care professionals (RN, PharmD, MD). PIPs have a BS degree and are either pharmacist techs, EMTs, or have prior experience in healthcare. They are supervised by a Certified SPI at all times. History: Annual stats for our regional PCC: case volume 100,000, total exp volume 85,000, and HCF exp volume 24,000. Staffing: 6.5 FTE PIPs, 1 FTE SPI, and 13.25 FTE CSPI. Average PIP tenure is 9 yrs, with a range of 1 to 11 yrs. A VOIP based ACD call routing system was installed in our PCC in 9/08, to provide direction to both phone lines in on phone activity. The ACD call routing system directs callers to press 1 if they are from the general public (GP) and 2 if calling from a HCF. Preferentially, GP calls go directly to a PIP if available, and all HCF calls go to SPIs. Discussion: The table below depicts average telephone workload for a month period. PIPs take more calls and exp per hour, but total minutes per hour handling poisoning calls are slightly lower than for SPIs. The majority of GP calls are managed on-site with simple first aid instructions; 64% are closed as minimal effects possible without any further f/u. Using trained PIPs to handle these calls allows SPIs to expand their knowledge base and ability to manage GP calls in the hospital setting. PIPs have been active in the development of the ACD call routing system directing callers on how to manage GP. Pressing 1 allows the calls to be handled without the CTI system, which is designed to handle HCF calls. The CTI system requires the caller to press 2 if calling from a HCF. SPIs handle 17,500 calls/year originating from HCF (30% of individual SPI call volume) and f/u on all cases referred to HCF (~6,500/yr). Conclusion: Telephone technology and using PIPs as SPI extenders closely aligns the talents of our workforce to the appropriate skill sets and allow our PCC to run efficiently.

41. Pulmonary Complications Related to Cocaine Base Paste Abuse

Pascale A.1,2  Negrin A,1,2  Ormaechea R.2
1Toxicology Department, Hospital de Clínicas, Montevideo, Uruguay; “Drug Reference and Information Centre “Pepito Amarillo” Department of Public Health, Montevideo, Uruguay.

Background: Cocaine base paste (CBP) is a highly volatile additive form of smoking cocaine. Lung injury is due to CBP compounds (cocaine, other alkaloids, adulterants) and the route of administration: inhalation of base paste from burning aluminum cans and plastic pipes. Objective: determine the main respiratory clinical features and pulmonary complications of CBP use. Method: this is a retrospective study of 20 CBP smokers who were admitted to the Drug Treatment Reference Centre during a three month period. Patients with less than one year of CBP use, known lung disease and HIV infection were excluded. Data were obtained from medical history, chest radiography, high resolution computed tomography (HRCT), respiratory function test, doppler echocardiography and complete blood count. Results: All patients were men, regular CBP smokers with an average age of 26 years. Tobacco and cannabis use was present in all the sample studied. The media duration of cocaine smoking was 4 years. 82% of CBP users revealed a history of cocaine hydrochloride use, and 11 % of crack abuse. Respiratory symptoms were present in all CBP users, including cough, dyspnea, wheezing, and carcinoblastic sputum. Frontal chest echocardiogram showed sign of left ventricular hypokinesia in 18 of 20 patients. HRCT scan revealed air space nodules in nine patients. In two cases interstitial damage was found. Emphysema was present in four CBP users. Respiratory function test and Doppler echocardiography were normal in all cases. Mild eosinophilia was found in five patients. Pulmonary alterations to the lung were not found in any of the cases. Discussion: Respiratory symptoms in CBP users are common. Pulmonary complications as tracheobronchitis, eosinophilic pneumonitis, emphysema and small airway obstruction observed in this preliminary study reveals that, despite the difference between crack and CBP composition, both are smokable forms of cocaine with a similar respiratory toxicity. Role of tobacco and cannabis use in respiratory dysfunction tests are normal in mostly smoking cocaine users. Further studies in order to characterize “CBP lung” should be performed, including determination of diffusion capacity of carbon monoxide and bronchoalveolar lavage.

42. Successful Resuscitation of a Doxepin Overdose Using Intravenous Fat Emulsion (IFE)

Carr D.1, Boone A.2, Hoffman RS.3, Martin K.3, Ahluwalia N.4
1University Health Network, Toronto, ON, Canada; 2University of Toronto, Toronto, ON, Canada; 3NYC PCC, New York, NY, USA; 4Oakville Trafalgar Memorial Hospital, Oakville, ON, Canada.

Background: Experimental evidence demonstrates that intravenous fat emulsion (IFE) improves cardiovascular function following poisoning from cardiovascular depressant agents. Actual data from poisoned humans is very limited. We describe the first case of a doxepin induced cardiovascular collapse successfully resuscitated with IFE. Case Report: An 80 year old man was brought to the ER after an apparent doxepin overdose. He had been last seen 4 hours prior to his arrival. His family found him with an empty bottle of doxepin and his own funeral arrangements. By history, the patient ingested about 1.5g of doxepin (19mg/kg). In the field his GCS was 3, with a BP of 56/34 and a HR of 60, and he was intubated. An ECG revealed a QRS of 113 msecs. The patient was treated with IV fluids, dopamine and 2 ampoules of NaHCO3 bolus followed by a NaHCO3 infusion. Laboratory analysis was non contributory. Dopamine was stopped and increasing titrations of norepinephrine and vasopressin were started for refractory hypotension, as well as 6 ampoules NaHCO3 for continued QRS widening. Orogastic lavage was performed and activated charcoal was given. Despite a pH of 7.73 with a Paco2 of 23, he remained hypotensive. At the suggestion of the on-call toxicologist IFE was started as a 225ml bolus of 20% IFE followed by an infusion, for a total of 10g over 90 min. While the infusion was running, he was intubated and non sustained ventricular tachycardia. The patient received treatment with lidocaine and magnesium sulphate. At about 2.5h after the start of IFE, his BP stabilized and he was weaned off his bикаротине and vasopressor infusions. Conclusion: This case highlights an extraordinary outcome in an unstable doxepin overdose treated with IFE. IFE therapy has a potential role in the treatment of other lipophilic ingestions such as beta blockers, calcium channel blockers and toxicity from local anesthetics. Future case reports and experiences need to be collected in order to define IFE therapy's precise role in the management of overdoses.

43. Fatal Occupational Methanol Toxicity after Confined Space Entry in Two Firefighter Crownworkers

Kleiman RJ.1,2 Schwartz MD.2, Nickle RA.1
1Emory University, Atlanta, GA, USA; 2Centers for Disease Control and Prevention, Atlanta, GA, USA; 3Georgia Poison Control Center, Atlanta, GA, USA; 4Division of Toxicology and Environmental Medicine/ATSDR, Atlanta, GA, USA.

Background: Methanol toxicity is an infrequent cause of morbidity and mortality in the occupational setting. Typical non-occupational exposures involve the ingestion of such products as moonshine or fruit juices. Methanol exposure via the inhalational or dermal route may occur in the occupational setting. We present...
a case of severe methanol toxicity (one fatality and one severe disability) in two freewheeling crews exposed to methanol during a confined space entry. Case Report. Two sailors were working on a tank that had just offloaded a shipment of methanol. The empty tanks were being cleaned with salt water and the two crews were tasked to enter the confined space for a few hours of work. Reports indicate that they were each wearing personal protective equipment (PPE) with a self-contained breathing apparatus (SCBA). One man complained of a headache 2.5 hours after leaving the confined space and was found dead in his cabin 24 hours later. The autopsy confirmed cause of death to be “acute toxicity due to methanol.” The second man developed dizziness and vomiting about 27 hours after his exposure in the confined space. He was transferred to a hospital on shore where he continued to deteriorate necessitating intubation for altered mental status. He was acidic with an elevated serum osmolality. When the methanol exposure history was discovered, he received fomepizole and underwent hemodialysis. His initial methanol level was 89 mg/dl. His condition improved and he was extubated, however he was noted to have significant visual loss and cognitive defects. Case discussion: This case underscores the dangers of confined space entries involving potentially dangerous chemicals. Potential routes of exposure in this case include dermal absorption of liquid or vapor, inhalation as a result of failure of protective measures, or ingestion. Conclusion: We report two cases of occupational methanol toxicity after a confined space entry. While the exact route of exposure is still under investigation, this incident highlights the significant occupational hazard associated with confined space entry in a toxic atmosphere.

44. Poison Control Center Utilization of Remote Agents during Hurricane Season
Forrester MB,1 Thompson JD,2 Villanacci JC.1
1Texas Department of State Health Services, Austin, TX, USA; 2Southeast Texas Poison Center, Galveston, TX, USA.
Background: To improve the surge capacity of a poison control center (PCC), two remote telecommuting workstations were added to the PCC. These remote agent workstations are designed to be operated by individual PCC call-takers from remote locations, usually at the call-takers homes, during surge events or when a center is closed due to a natural or man-made disaster. We describe the use of these remote agents during two 2008 hurricane season events. Methods: Total call volumes were tallied for remote agents during the times of disaster impact. Tropical Storm Edouard call volumes were tallied for remote agents during the two emergency events.
Results: PCC reopened on the morning of August 6. Remote agents handled 969 calls with a daily average of 203 calls per day. From August 6–31, the PCC handled a daily average of 203 calls per day. On August 5, the remote agents handled 144 calls. From August 6–31, the PCC handled an average of 203 calls per day. Two remote agents were not able to handle the same volume of calls as the full time PCC. Remote agents can play a role in reducing the impact of disaster events on a PCC.

45. Effect of a Restrictive Pill Identification Policy – Six Years Post-Implementation
Jaramillo JE,1,2 Forrester MB,1,3
1Texas Panhandle Poison Center, Amarillo, TX, USA; 2Texas Tech University HSC School of Pharmacy, Amarillo, TX, USA; 3Texas Department of State Health Services, Austin, TX, USA.
Background: Poison centers have long recognized the controversies regarding pill identification (pill ID) services. In 2003, our poison center implemented a restrictive policy that limits the provision of pill ID to the public based on specific criteria, while continuing to provide pill ID to healthcare providers and law enforcement with little restriction. Primarily, we no longer provide pill ID to callers who have “found” a pill or who are asking for the ID of a pill belonging to another individual. Objective: The objective of this analysis was to determine the effect of this restrictive policy on pill ID calls at our “PCCy” (PCC versus “Non-Policy Centers” (NPC)). A secondary objective was to determine if pill ID requests from the public, 2) healthcare providers, and 3) law enforcement and to compare this data to that of NPCs. Methods: Standard Toxicall® (electronic charting) reports were run for the PC and five NPCs for 2002, the calendar year prior to policy implementation, and for the 2008 calendar year. NPC results were combined and reported in aggregate. Results: The overall change in pill ID calls is depicted in the table. Also depicted are the changes in proportion of calls from the public, healthcare providers, and law enforcement expressed as a percentage of total pill ID requests from 1) the public, 2) healthcare providers, and 3) law enforcement. A shift in pill ID calls from law enforcement is also seen. Discussion: As poison center administrators face financial challenges, they should consider the impact of the provision of pill ID services. Implementation of a restrictive policy may successfully slow the growth of these calls allowing staff to focus their efforts on services consistent with their mission. As pill IDs from law enforcement officers continue, centers may want to consider implementation of a fee-for-service plan to cover necessary expenses in the provision of these services.

46. Use of a Survey To Evaluate Education Effectiveness
McDougle B, Chambers-Emerson J, Dignan J.1
1Poison Center of Tallahassee, FL, USA.
Background: A question that has plagued poison center educators over the years has been: How effective is the education that takes place at health fairs? One measure of success is the number of attendees gaining awareness of the poison center services. Injured knowledge also occurs at health fairs but it is difficult to report. A survey method using postcards was used in an attempt to measure education outcomes. Methods: Senior citizens at a health fair were asked about their willingness to participate in a survey. They were given a packet of brochures, a stamped postcard and an explanation of the tabletop display. Participants were instructed to take the packet home and answer the questions on the postcard. An incentive gift (LED nightlight) was mailed upon receipt of the postcard. Question# 1 centered on customer satisfaction (“How did you like the exhibit?”). Participants were then asked to increased awareness (“What did you learn?”). The last two questions asked behavioral intentions regarding poison prevention. Results: The postcard return rate was 45% of the participants provided an amazing variety of responses. Some had no prior knowledge about poison centers while others simply needed to know the hotline number. They learned facts about plants, pets, medications and insects. Seniors described poison prevention plans such as deleting food toxins from a pet’s diet, improved container labeling, checking for expired drugs, moving toxic houseplants and checking hazards room-by-room. Discussion: Facilitating free text responses yielded more information than a multiple choice test where seniors could simply “check the boxes.” The survey provided qualitative information that recorded increased awareness at a health fair. Conclusion: The postcard survey was a successful method of evaluating poison prevention message and the exhibit’s effect. Future poison center plans were shown in intentions to carry out poison prevention activities in the home. As a needs assessment, it identified topics of interest that will be highlighted in future displays, presentations and publications for seniors.

47. Accidental Poisoning with Monosodium Methanearsonate
Cox RD,1,2 Orridge J,3 Burns BA.4
1University of Mississippi Medical Center, Jackson, MS, USA; 2Mississippi Poison Control Center, Jackson, MS, USA.
Background: Monosodium methanearsonate (MSMA) is an organo-arsonic herbicide. Case series: Seven healthy teenagers (15 to 18 years old) accidentally used the liquid in a 5-gallon white plastic container, thought to be cooking oil, to fry fish. Each ate three to five bites of the fish. Within 30 minutes several began vomiting. They learned the container contained MSMA (24%) As by gas chromatography. They were all admitted as预案s: two were admitted to intensive care. The MSMA solution was treated with dimercaprol 2.5 mg/kg IM every four hours for 24 hours. After 24 hours all of them were feeling well and discharged. Fifty days after the ingestion 90% of their blood arsenic was normal. McNary arsenic levels 7 hours after the ingestion were 328 to 613 μg/L (n=2). Arsenic arsenic levels 6 hours after the ingestion and prior to dimercaprol were 64,147 to 226,328 μg As/g-creat (n<50). Arsenic levels in 24-hour urine collected the first day during dimercaprol treatment ranged from 2,321 to 12,310 μg/L (n<80 μg/L). Five days after the ingestion, the arsenic arsenic levels had returned to normal (6 to 13 μg/L). Twenty-four hour urine arsenic levels were 42 to 336 μg/L (60 to 208 μg As/g-creat). On day 24, all completion of the succinyl therapy, 24-hour urine arsenic levels were all normal, 10 to 34 μg/L (25 to 52 μg As/g-creat). Five of them had seven of elevations of the AST, peaking between 64 and 238 U/L (n<50 U/L) on the third day, then returning to normal. They were followed for 15 months. None of them reported any academic problems in school or had symptoms of neuropathy or other problems. Discussion: MSMA is an organic pentavalent arsenic compound. It is felt to be less toxic than inorganic trivalent arsenic, although human toxicity information is limited. Conclusions: This accidental ingestion of MSMA resulted in extremely high levels of arsenic. None of the patients experienced GI symptoms and five had mild transient elevations of the AST. All were treated with dimercaprol and succinyl. No persisting problems were observed.
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Chen JG, 1 Lodeserto FJ, 2 Ming DY, 1 Turner KM, 2 that IV NAC is not commenced empirically provided >20.25 hours IV NAC treatment. (0.82–1.29, NR 0.9–1.1). No patient required Results: NAC.

Introduction: UK guidelines for management of non-staggered acetaminophen (APAP) overdose use plasma APAP concentration plotted on a Rumack-Matthew derived nomogram to assess the need for IV N-acetylcysteine (NAC) therapy. Early reports suggested IV NAC provided protection against APAP related acute liver injury (ALI) if commenced within 8 hours of non-staggered ingestion. Therefore UK guidelines recommend IV NAC is not commenced empirically provided plasma APAP concentration is available within 8 hours of ingestion. Recent case reports suggest ALI can occur in non-staggered APAP poisoning even if IV NAC is started with in 8 hours of ingestion. The study aim was to assess whether this is common phenomenon. Methods: Data on all patients presenting to our inner-city teaching hospital is prospectively collected on our purpose-designed, approved, clinical toxicology database. We retrospectively extracted data for the 36 month period March 2005-Feb 2009 for adults (>15 years) presenting with non-staggered APAP overdose, a reliable history of ingestion time, requiring IV NAC based on plasma APAP concentration, and who commenced IV NAC within 8 hours of reported ingestion. Data was collected on the post- NAC plasma APAP concentration and requirement for further NAC. Results: There were 1223 related APAP presentations; 123 met study inclusion criteria. 60 (48%) patients were classified as high-risk for APAP related toxicity (24 chronic ethanol abusers, 11 malnourished, 1 CYP enzyme induction). Mean plasma APAP concentration 195μg/ml (46–687). Post IV NAC results: mean ALI 1.85–5.5 μg/ML (NR 4–45 μU/L), mean IR 1.08 (0.82–1.29, NR 0.9–1.1). No patient required >20.25 hours IV NAC treatment. Conclusions: All patients at risk of APAP related ALI based on their post-nal plasma paracetamol concentration who received 20.25 hour IV NAC infusion within 8 hours of overdose recovered and none developed ALI (ALT > 1000 IU/L). This suggests that current guidelines, recommending that IV NAC is not commenced empirically provided plasma APAP concentration is available within 8 hours of ingestion are safe - however, larger studies are required to confirm these findings.

54. A Case of Mislaid Identity: A Fatal Paranormal Ingestion in a Child Chen JG, 1 Lodeserto FJ, 2 Ming DY, 1 Turner KM, 2 Verdile CA, 3 Sporn TA, 3 Eldridge DL. 1

55. Fatal Intentional Sodium Azide Poisoning Mutz S, 1 Meathrell R2, 1 Patulnick W. 1

Background: Sodium azide is a rare human poisoning that can result in fatal outcomes. Its lethality appears to be related to its effects on cellular respiration. However, the exact mechanism is controversial. Case report: We present a case of a 59 y.o. male who presented about 1 hour after intentional sodium azide ingestion to the ED. He was admitted with hypotension, respiratory failure, profound lactic acidosis, and coma. Significant laboratory values on presentation were: plasma lactate 8.5 mmol/L (0.0–2.2); blood ethanol 39 mg/dL (0.05); blood cyanide 0.5 μg/mL (< 0.2 μg/mL). Arterial blood gas analysis indicated a metabolic acidois, with a pH of 7.2 (N: 7.35–7.45) and a bicarbonate of 15 mmol/L (N: 22–26). Additionally, mixed venous oxygen saturation levels of 90–97% (arterialization) were observed. Management included intubation and ventilation, rapid cyanide antidote kit administration, volume resuscitation, vasopressor support, and after ICU admission, exchange transfusion, veno-arterial extracorporeal membrane oxygenation (ECMO), continuous renal replacement therapy and induced hypothermia. Treatment was withdrawn approximately 24 hours after ingestion when brain death was confirmed. Our patient’s sodium azide levels were later determined to be 5.6 μg/mL on admission to the ED (about 1.5 hrs post ingestion), 13.7 mg/mL at 5 hrs, 6.8 mg/mL at 12 hrs and 0 mg/mL 19 hrs post ingestion. Discussion: This case demonstrates the significant toxicity experienced after a sodium azide ingestion. The patient had evidenced coma by the time of presentation. Support to this has been previously published in vitro studies that sodium azide inhibits cellular respiration. To the best of our knowledge this is the first report of mixed venous oxygen saturation levels and sodium azide toxicity. This case also demonstrated the ineffectiveness of the cyanide antidote kit and of ECMO. Conclusion: Sodium azide is an extremely toxic agent. Similar to cyanide, toxicity is probably related to its effect on cellular respiration. Treatment with the cyanide antidote kit and ECMO were ineffective in our patient.

56. Two for the Price of One: Oculat Salicylate Overdose Masked by Sodium Cyanide Poisoning Meehan TJ, Kalimullah EA, Erickson TB. University of Illinois - Chicago, Department of Emergency Medicine, Chicago, IL, USA.

Background: We report a case of survival after intentional ingestion of both sodium cyanide (NaCN) and acetylsalicylic acid (ASA). Case report: A 43 y/o male was found unresponsive in his home by family. He was transported to the ED via EMS. On arrival, he was unresponsive with the following vital signs: afebrile, BP 101/62, P 103, R 30s, and SaO2 96%. After emergent intubation, a profound metabolic acidosis with hyperlactatemia was noted (6.97/55/126/12, lactate 14.2mmol/L). Both the local police and hospital hazmat coordinator contacted our poison center for information on NaCN disposal. Given the clinical presentation, along with other evidence (NaCN container from an online chemical store and a sports drink bottle with powder residue), hydroxocobalamin (Vit B12a) treatment was likely for cyanide toxicity was recommended. The pharmacy did not stock Vit B12a, so sodium nitrite and report euthanasia were used. No antidote kit administration yielded a MethHgb of 6.5% and reduction in acidosis (7.1/52/177/16). On routine screening, the serum ASA level was 45mg/dL and alkalinization therapy was begun. A repeat ASA level 4 hours later increased to a peak of 91mg/dL, and he was dialedyzed once with improvement in both ASA burden and acidois. The patient was extubated on day 2 post ingestion and admitted to the 1 week ICU. When this failed to cause death, he drank a mixture of NaCN and Gatorade®. His initial serum CN level was 1.22mcg/dL. Case discussion: This case is unique in that the patient presented with classic findings of CN poisoning complicated by a concomitant ASA overdose. Had the latter toxicity gone undetected, it may have resulted in serious morbidity or death. Secondly, it reveals the importance of communication with police and EMS when patients are found unresponsive for unclear reasons. This also highlights the risks of having highly lethal chemicals readily available by internet for sale to individuals. Conclusion: We report survival with a favorable outcome after ingestion of a mixture of NaCN and ASA. To our knowledge, this is the first reported case of a mixed ingestion of CN and ASA that required both the CNAK and dialysis.

57. Crazy for Caustic: A Retrospective Review of Peyote Exposures Carstairds SD, 1 Cantell PF. 2

University of California, San Diego, San Diego, CA, USA. 2California Poison Control System, San Diego, CA, USA.

Introduction: Peyote is a cactus containing the halluci- nogen 3,4,5-trimethoxyphenethylamine, found primarily in the southwestern United States and northern Mexico. Although it is used ceremonially by various Native American tribes, its use has also been well-described. However, there are currently no published case series of illicit exposure to peyote. We sought to identify characteristics of patients with reports of peyote exposure andlor misuse to presenta a retrospective review of a poison center database for all cases of single-substance human exposure to peyote using the terms “peyote” and “mescaline” for the time period 2001–2008. Demographic data on route of exposure, whether exposure was intentional, clinical effects, duration of effects, treatment, and medical outcome. Results: There were a total of 31 reports of peyote exposure, of which 26 (84%) were age 25 years or less. Thirty (97%) exposures were intentional. Reported effects included hallucinations (n = 18), tachycardia

Mortensen ME, Caldwell KL, Caudill SP, Osterloh JD, Jones RL.
Centers for Disease Control and Prevention, Atlanta, GA, USA.

Background: Mercury (Hg) measured in whole blood is primarily organic Hg (e.g., methylmercury). We describe the distribution and demographic characteristics of total blood Hg (TBHg) levels in the U.S. general population among participants in the 2003–2006 National Health and Nutrition Examination Survey (NHANES). TBHg trends are described for children ages 1–5 and females ages 16–49 during 1999-2006. Methods: A descriptive analysis used NHANES demographic and TBHg results for persons ages 1 year and older (n = 16,780) during 2003-2006; children ages 1–5 and females ages 16–49 during 1999-2006. Results: In the 2003–2006 survey periods, TBHg estimated geometric means were similar for non-Hispanic blacks (NHB) and non-Hispanic whites (NHW), 0.853 and 0.833 µg/L, respectively) and lower in Mexican Americans (MA), 0.580 µg/L. Regression of log TBHg with age, race/ethnicity and gender showed interactions between gender and age (p = 0.0013) and sex/ethnic group and age (p ≤ 0.0001), but not between gender and age (p = 0.0975). Model-adjusted geometric mean TBHg levels in the population exhibited a quadratic increase with age (p < 0.0001), peaking at ages 50–59 in NHB and NHW, at ages 40–49 in MA, and then declining at older ages. For TBHg in children during 1999–2006 there was an interaction between survey period and race/ethnicity (p = 0.0975). Adjusted geometric mean TBHg levels increased slightly for NHW children and decreased slightly for NHB and MA children. Female children had slightly higher TBHg levels than males (0.356 vs. 0.311 µg/L, p = 0.0050). Conclusions: In the general U.S. population, TBHg increased with age until the fifth or sixth decade, and then declined. Overall, geometric mean TBHg levels were higher in NHB and NHW and lower in MA. Declining and levels of TBHg were evident in NHB and MA children over the period 1999-2006. No statistically significant trend from 1999–2006 was noted in the TBHg results for females ages 16–49.

60. The Kiss of Death: Case Report of a Western Gaboon Viper Bit (Bitis gabonica) Bites to the Face

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Background: Envenomation with exotic venoms is uncommon in North America. Management may be challenging due to unfamiliarity with specific venom toxicity as well as difficulty in obtaining antivenin. Bitis gabonica envenomation is described as having a high mortality rate, large amount of venom and systemic toxicity. This paper describes the case of a snake enthusiast who was bitten on the lower lip by a Bitis gabonica viper. Case report: This patient presented to hospital within 20 minutes of a bite to the lower lip with some swelling at the site. The patient was intubated electively for impending airway obstruction. Antivenin was given in the surrounding province approximately 3 hours after the bite occurred but administration was delayed for 7 hours due to the need to charter a jet for transport. In the interim, management of the patient was supportive and serial testing for coagulopathy was performed, all of which were negative. After administration of antivenin, the patient’s swelling decreased significantly and within 8 hours the patient was extubated. The patient remained stable and was discharged from hospital 24 hours later. Serial blood tests and follow up 48 hours after the bite showed no evidence of systemic symptoms or coagulopathy. Discussion: Bitis gabonica envenomation may result in significant mortality due to the large amounts of venom deposited into its victims as well as the systemic hematologic effects. In retrospect, our patient likely suffered a “dry” bite due to the absence of clinical envenomation effects. This case highlights the logistic problems associated with management of exotic snake bites. Conclusion: We report a case of Bitis gabonica envenomation to the face that presented with local swelling that was managed with airway care and antivenin administration. Treating a venomous bite to the face without quick access to antivenin added complexity to the management.

61. Central Nervous Toxicity after Ingestion of Tea Tree Oil

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Background: Melaleuca oil, also known as Tea Tree Oil (TTO), is a complex mixture of compounds produced by distillation of leaves and twigs of the Australian tea tree, Melaleuca alternifolia. Its antimicrobial activity led to a rich history in folk medicine, and it is considered important in treating skin ailments in modern times. Oily tea tree oil is pale yellow in color and is comprised of 50–60% terpenes. The Standards Association of Australia standard for TTO requires that in marketed products, the cineole must be kept below 15%, and terpin-4-ol kept over 30%. The type and range of human toxicity of essential oils is poorly characterized. Previous reports describe minimal ingestions that resulted in confusion, ataxia, malaise, nausea, vomiting, diarrhea, abdominal pain, and rash. Significant mental status depression is rarely reported. This report documents a case of human poisoning manifested as vomiting and coma after TTO ingestion.

Case Presentation: A 17-year-old male was brought to the emergency department by his family following his ingestion of 30ml of TTO. He was a regular user of TTO ingestions uncontrolled by diazepam therapy. It was decided to stand him on the CIWA-Ar (Clinical Institute Withdrawal Assessment of Alcohol) scale as for alcohol withdrawal. The patient scored 12 on CIWA-Ar because of anxiety and hallucinations so diazepam was administered accordingly every ninety minutes.
63. Visualization of Poison Center Call Data

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Background: Poison Control Centers (PCC) often need to understand internal and external factors that impact call volume for injury prevention. We visually analyzed PCC data utilizing available and open source application programming interfaces (APIs) is provided. Methods: Custom code was used in tandem with the Google™ chart API to provide visualizations in the form of a dynamic time series chart that was published on the internet. In addition, the custom database query includes language to allow PCCs to quickly see the relationship between data out- stakers and the larger data set. It’s an easy method to demon- 
strate to business partners the impact on call volume by such new products. Results: The purpose of this study was to bring trends and in explaining a dataset to those unfamiliar with the
case. In the future, we intend to conduct all AHLS Case Stud- 
ies as simulations and identify any skill/knowledge dif- ferences between simulations and desktop experiences.

65. Chronic Difluorohydrocarbon Abuse Associated Peripherial Neuropathy Treated Successfully with Gabapentin

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Introduction: Chronic halogenated hydrocarbon abuse has not been associated with peripheral neuronal toxicity or nerve conduction slowing in humans. We report a case of chronic difluorohydrocarbon abuse associated with paresthesias of the arms and legs which improved with re-exposure to difluo- 
rethane (DF) or gabapentin therapy. Case report: A 53-year-old man reported to an inpatient illicit drug program for his 30 years of DF abuse. On further questioning, he disclosed a chronic cocaine and marijuana user, to maintain his employment the patient agreed to abstain from illicit drug use and consented to random drug testing. Due to his craving and withdrawal symptoms after stopping DF, the patient requested alternatives from the treating psychiatrist. Therefore he discov- ered an alternative source that would not be detected on random urine drug screens, a keyboard cleaning spray containing DF. The patient started to inhale this product 8 times daily for 7 years. During the 2nd year of con- 
stant use he reported severe pruritis developing in his hands and feet which progressed to both arms and legs, which would resolve upon re-exposure to the DF con- taining product. The patient was tried on diphenhy- 
dramine and hydroxyzine on separate occasions, without relief. He has no past or family medical history or medications. He worked as a custodial engineer and previously smoked 2–3 packs a day and did not drink alcohol. His vital signs and skin were normal.
He had decreased sensation in a glove-and-stocking dis- tribution but an otherwise normal neurological exami- 
nation. The patient had a workscreen for lead and he was negative. Sensation was decreased in both feet and a skeletal fluorosis and laboratory analysis that revealed normal blood counts and a normal complete metabolic panel. A neurologist consultation suggested that his pruritis may be a representation of a peripheral neurop- 
athy and attempted to a trial of gabapentin at 300 mg 3 times daily. After 1 day of therapy, the patient reported complete relief of his symptoms. Conclusion: Neither fluorinated hydrocarbon abuse has been associated with either peripheral neuropathy or withdrawal symptoms. It appears that gabapentin at standard adult dosing has relieved this patient’s symptoms. The etiology of his pruritis is most likely either a form of peripheral neur- opathy associated with prolonged DF abuse or a with- drawal syndrome that is not well characterized.

66. Clinical Effects Following Aripiprazole (Abilify®) Ingestion by Young Children

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Background: Aripiprazole (Abilify®) is an atypical antipsychotic agent first approved by the FDA in late 2002. It is now approved for the treatment for the treat- ment of schizophrenia and bipolar disorder, and it is approved as an adjunct for the treatment of depression in adults. However, there have been no published reports on its effect on young children. Objective: The purpose of this study was to determine the clinical effects of aripiprazole ingestion by young children. Methods: Retrospective, observa- 
tional study of the telephone calls to one state’s poison centers for single agent exposures to aripiprazole from 2003 through 2008 for children under 6 years followed to a known outcome. Results: There were 116 chil- dren (56.9% male) who met the inclusion criteria. The amount ingested ranged from less than 2 mg to 280 mg. Only 44 (37.9%; 95%CI: 29.6% – 47.0%) children were confirmed cases of ipecac exposure. While not frequently cern for a malicious cause. While there is no laboratory test to prove exogenous NaPO 4 use, emetine and ceph- 
diazine were administered to facilitate an oral emetic. The patient remained stable and was discharged home a few hours later with a follow up appointment. The patient has not returned to the clinic.

67. Sodium Phosphate and Munchausen Syndrome by Proxy

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Background: Child abuse is a significant contributor to pediatric morbidity and mortality, with nearly 3 million cases reported each year. Here we present a case of sus- pected child abuse involving NaPO 4 poisoning compli- cated by confirmed specie exposure. Case report: An 11-year-old female developed halogenated hydrocarbon dehy- 
derization while hospitalized for C. difficile enteritis on metronidazole. She spent 5 days in the ICU on total parenteral nutrition for emesis (50 episodes/day). This was resolved on day 14. She returned 10 days later with lethargy and diarrhea (10 stools/day). She was hypothermic (93.2°F cent- 
ally), required an isolette, received ceftriaxone and intravenous fluids, and was admitted. She developed carpopedal spasms on day 3 and was transferred to the ICU. She had hypocalcemia (nadir 6.3mg/dL), hyperphosphatemia (peak 14.8mg/dL), hypernatremia (peak 156mmol/L), and an elevated BUN (28mg/dL). PTH was 294.8 pg/mL (normal 10–70). Urine Ca was low and PO 4 high. Renal ultrasound was normal. She received CaCO 3 and Al(OH) 3 and was transferred to a tertiary center on day 5. She was hypocalcemic and hyperphosphatemic on admission to the tertiary center (Ca 6mg/dL, PO 4 10mg/dL). A skeletal survey, CT scans of her head, abdomen, and chest, upper endos- copy, sigmoidoscopy with biopsies, and stool studies were normal. A low phosphorus diet was started, and symptoms resolved. The negative evaluation left con- 
cern for a malign competitive. While there is no laboratory test to prove exogenous NaPO 4 use, emetine and ceph- 
diazine (both >200mg/mL) were detected in the urine. Case discussion: We present a case of Munch- 

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negative workup. We are unaware of other MSP cases involving NaPO₄. Conclusion: Child abuse continues to affect pediatric morbidity and mortality. This case serves to remind practitioners of the potential voids of NaPO₄ in cases of MSP.

68. Not Such a Headache after All: A Retrospective Review of Intentional Excedrin® Overdoses

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Background: There is little literature specifically addressing the typical course of intentional overdoses (ODs) of aspirin (ASA), acetaminophen (APAP), and caffeine (CAF) combination headache remedies (e.g., Excedrin®). These ODs could potentially pose a management challenge due to need for multimodal treatment with both antidotal therapy and one or more enhanced elimination techniques. Interferences between usually employed decontamination, antidotal, and extra-corporeal elimination techniques may theoretically occur. Case series: We reviewed all intentional ASA 250mg/APAP 250mg/CAF 25mg combination product ingestions in patients ≥13 y reported to our poison control center (PCC) over a 12 mo period. Only cases with recorded levels of both ASA and APAP were included. Cases were reviewed for reported comorbidities, vomiting, charcoal, management, and coded interventions. A total of 124 cases were reviewed. Mean patient age was 23 y (range 10–53). The mean number of pills reported orally ingested was 17 (range 1–150), resulting in peak ASA and APAP levels of 17 mg/dL (high 42 mg/dL) and 41 mg/L (high 253 mg/L), respectively. Coma-gists were involved in 46% of cases and vomiting was reported in 34%. With respect to coded interventions, 49% received charcoal, N-acetylcysteine (NAC) was given in 18%, and only 5% underwent urinary alkalization with NaHCO₃. There were no patients who died, required liver transplantation, or received dialysis. Case discussion: ASA/APAP/CAF combination product ODs reported to our PCC resulted, on average, in modest peak ASA and APAP levels. The low rates of NAC and NaHCO₃ therapy are striking, especially when coupled with the absence of deaths, liver transplants, or dialysis use. While a paucity of significant exposures may account for these findings, somewhat frequent spontaneous decontamination via vomiting may be contributory. Conclusion: Despite a theoretical potential for serious toxicity requiring multimodal management, ASA/APAP/CAF combination product intentional ingestions planned to our PCC did not result in serious toxicity. Our series provides insight into a rarely discussed form of commonly encountered agents.

69. Organophosphate Incidents Reported to the National Pesticide Center: Role of Regulation

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Background: Significant regulatory changes were implemented for residential uses of diazinon and chlorpyrifos between 2000 and 2002 based on inadequate protection of human health from revised risk assessments. Prior to these regulatory changes, diazinon and chlorpyrifos were commonly used organophosphates (OPs), along with malathion, which was not targeted by regulatory action. The purpose of this study was to analyze data collected by the National Pesticide Information Center between 1995 and 2007 to determine if longitudinal trends in reported incidents among targeted OPs can be detected. Methods: Data were grouped from 1995–2002 and 2003–2007 and reported as a single pre- and post-regulation, respectively. Residential reports of total OP-related incidents, as well as chlorpyrifos, diazinon and malathion, were compared using an independent samples t-test with pre- and post-regulation periods. Results: NPIC received 3.385 OP-related incident reports that met the criteria for this study. Total OP-related incidents significantly decreased between the pre- and post-regulation periods (P < 0.001).

70. Media Awareness Campaign Increases Calls to Poison Centers

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Background: One of the vital functions of regional poison centers is to participate in surveillance of public health threats. A Real-Time Disease Grant was used to enhance the public’s awareness of poison center services. By prompting people to call the poison center for magnets, this action followed Behavior Modifying Theory by serving as a guide for future action after people have been exposed to a campaign. Results: A media awareness campaign, after hiring an ad agency experienced with non-profit health organizations. Ads were created for English- and Spanish-speakers in urban and rural counties. Grant funds purchased air time for cable television, radio and ads for newspapers and billboards. Messages were created to promote the poison hotline number, explain the primary poison center service and have an immediate call-to-action phrase. Different call-to-action plans were designed for different counties to help assess effectiveness. Analysis: Funds paid for 2265 cable television spots, 794 radio spots, 10 billboards and 138 newspaper ads in English and Spanish. Additional spots were donated by media. Results: Projections of numbers reached included: 12% of the statewide population via television; 68% of target cities’ population via radio; 180,000 people reached via ads and legs in addition to those exposed in newspapers and billboards. There was an increase in requests for interviews and poison center magnets. Poison center information calls increased by 31% during the three months of the campaign. Conclusions: Media outreach facilitated a method of low-literacy-region-wide outreach. It is difficult to gauge awareness because individuals may have been privy to the campaign, but not need the centers’ services at the time and, therefore, did not respond to the call-to-action. However, there was a documented increase in material requests, information calls and media requests during the campaign.

71. Systems Issues in the Management of Carburetor-Cleaner Huffing-Related Methanol Exposures at a Regional Poison Center

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Background: The medical error rates and other challenges involved in the recognition, diagnosis, and clinical management of inhalational carburetor fluid exposures have been well described. All human inhalational exposures to a carburetor cleaning fluid at a single poison center between 2000 and 2009 were reviewed. Cases were scored regarding recognition on the part of the poison center and/or caregiver of the potential for methanol exposure, appropriateness and timeliness of diagnostic recommendations and procedures, appropriateness of case management, and timeliness of diagnostic recommendations and procedures. Conclusions: Media outreach facilitated a method of low-literacy-region-wide outreach. It is difficult to gauge awareness because individuals may have been privy to the campaign, but not need the centers’ services at the time and, therefore, did not respond to the call-to-action. However, there was a documented increase in material requests, information calls and media requests during the campaign.

72. Acute Disseminated Eosinophilic and Transverse Myelitis after Intraoral Insufflation of Heroin

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Background: Heroin use has been associated with the CNS complications of transverse myelitis, stroke, spongiform leukoencephalopathy, and acute myelopa-thy. We present a unique case of acute disseminated eosinophilic myelitis as well as transverse myelitis after intraoral insufflation of heroin. Case report: A 29 y old former intravenous drug user presented to the Emergency Department with new onset paraplegia. She last remembered being out the night before at a party and getting into her car to go home. The next morning, she was found by EMS in her car with the inability to move legs and arms and decreased upper and lower back pain. 0.5 strength in all four extremities, no sensation and normal respiratory exam. Of note, normal labs included blood glucose of 98 mg/dL, potassium 3.6 mEq/L, 8.5 mEq/L sodium, 16.8 mEq/L chloride, and ESR negative or normal range. A urine drug screen was positive for opiates and benzodiazepines. Her MRI showed disseminated subacute and chronic myelitis and transverse myelitis from C2 to T1. After weeks of treatment, the patient left against medical advice and was lost to follow-up. Discussion: Heroin myelopathy after intravenous use is well established. There is one similar case report of acute myelopathy after intraoral insufflation of heroin. This case is unique in comparison because of the added complication of eosinophilia. Potential mechanisms for heroin myelopathy include direct toxic effect, decreased perfusion and vasculitis. Conclusion: This case expands the range of neurologic complications of intraoral insufflation of heroin to include eosinophilic myelitis.

73. Acute Nicotine Poisoning in a Toddler Resulting in Hyponatremia

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Background: Hyponatremia has been previously reported with nicotine patch therapy but to our knowledge not obtain, or obtain in a timely manner, methanol levels in 6 (25%) cases. Poison center management recommendations were inappropriate in 6 (25%) cases and hospital management recommendations were inappropriate in 5 (21%) cases. Eight of nine (89%) cases with a metabolic acidosis received specific treatment (ethanol or fomepizole). No adverse outcomes as a result in inappropriate diagnosis or treatment were seen, but relevant outcomes were unknown in 50% of cases. There was no difference in the rate of inappropriately managed cases between major population centers and rural areas. Discussion: The potential for methanol exposure in the huffing of carburetor cleaning fluids, and the process of diagnosis and management of methanol toxicity, have been known for decades. The high rate of failure to recognize, diagnose and/or treat these cases in our setting thus represents a variety of winds and systems failures. Conclusions: Improvements in multiple aspects of poison center and hospital healthcare delivery are required for improved recognition, diagnosis, and management of these cases.

Abstracts

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74. Drug-Induced Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis in Children: Clinical Manifestations and Outcome

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Introduction: Stevens-Johnson syndrome (SJS) and Toxic Epidermal Necrolysis (TEN) are life-threatening complications of drug therapy. Methods: We analyzed all SJS/TEN cases treated in two tertiary-care children’s hospitals in North America between 2000 and 2007. Results: Sixty-two children (34 male and 28 female) were included in this retrospective review. Symptoms included: skin blisters (100%), fever (85%), esophagitis (78%), diarrhea (55%), conjunctivitis (50%), GI bleeding (30%), and respiratory compromise (18%). The median age at presentation was 4.7 years (range 1–19 months). Most children developed a common prodrome of fever, skin rash, and trachea-intubation. The mortality rate was 14%. Conclusion: These cases highlight the importance of early recognition and prompt intervention. These children have a good long-term survival and recover completely.


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Background: NDPS features allow poison centers to examine national aggregate data for exposures and information calls by AAPCC generic categories (in these data, 926 minor group entered 161 major categories). Methods: We ran NDPS enterprise reports for years 2000–2008 and examined information call change over time as the absolute (linear call regression)/year and relative change (doubling time from linear regression of log-calls/year) for each major category and total. Results: Of the 162 regressions, 102 (63%) had significant p (0.05, 2000–2008, N = 9). The table shows the top 20 major categories (p < 0.05), 2008 call totals, and the mean rate of increase (doubling time from linear regression of log-calls/year). Discussion: Descending ranking shows the categories most responsible for the information call increase. The doubling times (mean growth rate over this time period) were ~3–fold faster and changes were more pronounced compared to exposure calls. Conclusion: These quantitative trends, remarkably consistent over time, may portend exposures or abuse. Addition of ranking algorithms to NDPS may help focus interventions, predict future poison center workload, and enhance the value of NDPS as a real-time data system.

117. “Go Lytely” Dissolves More Quickly

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Background: “Go Lytely” (PEG-ELS) is a water soluble hydrocarbon solution routinely used following acute poisonings for whole bowel irrigation (WBI). This is thought to be most beneficial in large sustained release acute poisons but is also used in acute iron poisoning and “body packers.” Some have suggested using WBI for large nonsustained poisonings as well. In addition, PEG-ELS is often given in “body stuffers” in which poisons are ingested. We theorize PEG-ELS could increase solubility of nonsustained release drugs. Methods: An artificial stomach model, polypropylene with volume 1.89L used. This was filled with 500mL of simulated gastric fluid in each group. 1 acetaminophen (APAP) 50mgs tablets were uniformly placed in the stomach model. In one group, 500mL sterile normal saline was added. In the other group, 500mL PEG-ELS was added. APAP concentrations were obtained at baseline, 15, 30, 60, and 90 minutes using a “thief” to standardized.
88. | New Insights into Root Causes of Accidental Unsupervised Ingestions (AUSIs) of Over-the-Counter (OTC) Medications


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AUSIs often result in calls to US poison centers & manufacturers of OTC medicines. Objective: Determine AUSIs root causes & relationship to normal medication use. Methods: US reports in children <12yo with AUSIs were analyzed. Conclusions: The most common root causes of AUSIs were minor differences in the order of the remainder of the top 10 MIR. Call volume from urban and rural areas paralleled the service area demographics.
in different room. Formulation: 71% pediatric. Intended recipient of ingested med: 56% child who had AUI (if intended for someone else 40% parent, 30% sibling, 15% grandparent). Dosage of med at time of AUI: 60% not normal storage location. Elapsed time: last therapeutic dose & AUI: 9% < 1min, 13% < 15min, 27% < 1day, 9% < 1wk, 10% > 1wk, 26% unknown.克莱姆son on device to access med: 50% Reported by gained access with: CR closure: 27% Normal storage of OTC Meds: 76% in high out of sight location, 71% in unlocked location, 71% in multiple rooms, 33% store OTC meds in location different from Rx meds, 33% store adult meds in location different from pediatric meds. Conclusion: Most AUIs with OTC meds occur in home, or bedroom or kitchen & are unobserved when the caregiver is in a different room. Results: 76% of patients ingested the OTC product purchased purportedly from a bottle of water purchased from a store. The 84 yo arrived with altered mental status. The 84 yo and 35 yo were discharged home. There were no inpatient deaths. The 35 yo was the recipient of ingested med. The majority of older adults do not see clinical toxicology as a resource and 74% will recommend it to others. Four of the medication safety tools (medication list, pill reminder box, PC magnet and medication wallet card) were utilized by more than half. Prior to receiving the materials, only 15% had called the PC for a medication-related question and 11% for a medication-related emergency. However, 51% stated they were likely to call the PC in the future for a medication-related question and an 72% stated they were likely to call the PC in the future for a medication-related emergency. Conclusion: The distribution of these materials increased the target population’s utilization of the PC. Survey results indicate an increase in the use of medications tools and services and a reduction in the likelihood of older adults accessing inadequate, cost-effective treatment via poison centers. The reported half-life ranges from 1 to 3 hours, though it may be longer in neonates and the elderly. While there are reports of prolonged half-life following overdose, we describe a case with prolonged half-life after documented therapeutic dosing. Case report: A 39 year-old female with a history of pancreatitis, hepatitis C and anorexia (BMI 14.5) presented to the ED for abdominal pain. She denied taking any APAP products prior to arrival, although her serum APAP concentration was 3.0 mcg/mL on admission. Her initial serum ALT was 37 IU/L. The patient was 37 IU/L. In the first 3 days of her hospital stay, she received a total of 3.5g APAP in the form of Vicon (5/ 500) as a prn order. At 56 hours post-admission the patient’s ALT acutely rose to 435 IU/L and serum APAP levels were noted to be supratherapeutic. She was started on IV NAC treatment and transferred to the ICU with a sitter. Serum APAP concentrations and ALT are shown in Table 1. Her post absorption half-life was 32 hours (95% CI 29 to 36 hours). The patient developed multi-system organ failure and died. Discussion: This patient had abnormal pharmacokinetics following therapeutic doses of APAP. In addition to a prolonged APAP half-life, her volume of distribution, calculated using her total dose and terminal clearance, was high at 1.9 L/kg (normal Vd 0.6 L/kg). As she was hospitalized, her doses were known and occult ingestion was unlikely. Possible explanations include malnutrition, liver dysfunction or congenital abnormal acetylaminohepton metabolism. 86. Girl Scouts and the Poison Center: A Partnership To Maximize Poison Prevention Education DeRienzo CA, Michels JE. Palmetto Poison Center, South Carolina College of Pharmacy, University of South Carolina, Columbia, SC, USA. Background: The Poison Center (PC) has formed a partnership with two Girl Scout councils within the state to establish the PC patch program. Through the PC patch program, over 24,000 girls have the opportunity to learn about poison safety and perform service projects related to teaching poison prevention to younger age groups. The Girl Scout program has focused on developing girls of courage, confidence, and character for over 96 years, and the PC patch program allows for the development of these characteristics in the girls who participate. Results: The majority of girls have the opportunity to learn about poison safety and perform service projects related to teaching poison prevention to younger age groups. The Girl Scout program has focused on developing girls of courage, confidence, and character for over 96 years, and the PC patch program allows for the development of these characteristics in the girls who participate. Discussion: This patient had abnormal pharmacokinetics following therapeutic doses of APAP. In addition to a prolonged APAP half-life, her volume of distribution, calculated using her total dose and terminal clearance, was high at 1.9 L/kg (normal Vd 0.6 L/kg). As she was hospitalized, her doses were known and occult ingestion was unlikely. Possible explanations include malnutrition, liver dysfunction or congenital abnormal acetylaminohepton metabolism. 85. Medication Safety: Who Ya Gonna Call? The Poison Center? Heiden MA, Northern New England Poison Center, MaineHealth, Portland, ME, USA. Background: The majority of older adults do not see the poison center (PC) as a resource for their medication-related poisonings. Therefore, many older adults may not get adequate, cost-effective treatment for their medication-related poisonings. Methods: An advisory committee assisted the PC in developing materials to educate older adults. The materials objectives were to establish the PC patch program. Through the PC patch program, over 24,000 girls have the opportunity to learn about poison safety and perform service projects related to teaching poison prevention to younger age groups. The Girl Scout program has focused on developing girls of courage, confidence, and character for over 96 years, and the PC patch program allows for the development of these characteristics in the girls who participate. Conclusion: Girl Scout participants not only learn aspects of poison prevention, but also become a partner with the PC for conducting programs throughout the state. This partnership will allow outreach efforts within our state to expand with minimal costs. This program has the ability to expand within the Girl Scout system and other service focused organizations. 87. The Incidence of Respiratory Depression during Emergency Department Chemical Restraint of Acute Nociception Rowden AK, Deitch KR, Aguilera E, Fasano CJ. Albert Einstein Healthcare Network, Department of Emergency Medicine, Philadelphia, PA, USA. Introduction: Patients with undifferentiated agitation delirium present frequently to the emergency department (ED) and often require chemical restraint. While serious adverse events are rare, the incidence of hypoxia and respiratory depression are unknown. Objective: To determine the incidence of the
respiratory depression in patients who are chemically restrained for psychomotor agitation in the emergency department. Methods: Prospective, observational study at a general hospital in the southeastern US. Approximately 20% of patients receiving chemical restraint were subsequently transferred to an ICU. Results: Four patients were transferred to the ICU because of respiratory depression. Two patients were intubated and received ventilatory support. The median time from administration of propofol to respiratory failure was 12 minutes (range 2-28 minutes). The median time from intubation to extubation was 44 hours (range 24-70 hours). Conclusion: Propofol is a safe and effective agent for chemically restraining patients in the emergency department. However, close monitoring and prompt intervention is necessary to prevent serious respiratory adverse events.

89. Massive Hymenoptera Envenomation by Native US Yellowjackets West PL,2 Hendrickson RG.2 1Oregon Health and Science University, Portland, OR, USA; 2Oregon Poison Center, Portland, OR, USA. Introduction: Envenomation by a large number of Hymenoptera can cause significant morbidity and mortality due to venom load. All cases of envenomation should be assessed for potential allergic response. Methods: The present study was a retrospective analysis of envenomations due to Southern yellowjackets (Vespula maculifrons) in central Oregon. The threshold for yellowjacket envenomation was 10 stings. Results: 116 cases of yellowjacket envenomation were identified from 2010 to 2016. 83% of cases involved patients 18 years and older. The median age of patients was 44 years (range 1-97 years). The median number of stings was 10 (range 1-7200 stings). The median time from first sting to arrival at the emergency department was 20 minutes (range 0-480 minutes). The median time from arrival at the emergency department to discharge was 3 hours (range 0-72 hours). The most common symptoms included localized edema, headache, nausea, vomiting, disorientation, and hypotension. Conclusion: Envenomation by yellowjackets can cause significant morbidity and mortality. Early recognition and treatment are critical to prevent serious complications.
primary caregivers of children less than 6 y/o presenting to Albert Einstein Medical Center ED. Eligible subjects were asked to complete a survey conducted by a research associate. Information collected included child’s age, presenting complaint, antipretic used, reason for analgesic preference, analgesic dose and reason for chosen dose. Caregivers were asked if they knew the analgesic active ingredient, recognition of trade vs generic name and perception safety of APAP versus IBU. Results: 122 surveys completed; 3 did not answer the question of interviewees excluded for incompletion (N = 116). Children’s mean age was 19 mos (range 33 days – 60 mos); most common complaint was fever without any other symptom (62%, 95%CI 53–70); 92/116 caregivers (79%, 95%CI 72–76) did not know the correct dose of APAP and 65% (73.9%) patients received APAP versus 24/92 (26.1%) IBU (effect size 48% 95%CI 38–58). Of the APAP patients 32/65 (49% 95%CI 35–59) received it based on health care provider advice, yet only 18/68 (27%, 95%CI 16–38) received correct dosage instruction from health care provider. 59.8% of caregivers gave incorrect doses of APAP or IBU. APAP patients had 56% incorrect dosing (26.5% underdose, 29.4% overdose) and IBU patients had 73.3% incorrect dosing (40% underdose, 33% overdose). 79% (95%CI 72–86) of caregivers did not know the correct dose of APAP and APAP with acetaminophen medication. 72% (95%CI 64–80) of caregivers did not recognize Advil and Motrin are both IBU. 48% (95%CI 40–57) of caregivers distinguished APAP and IBU were dosed correctly by vessels. APAP was preferred over IBU by 56% (95%CI 47–65) of the caregivers. 65% (95%CI 56–74) based that perception on physician’s instruction. Conclusion: A majority of caregivers have incorrect knowledge of APAP and Tylenol or Advil. Motrin are the same medication. Caregivers of children frequently provide incorrect dosages of APAP and IBU. APAP was the preferred analgesic by caregivers of children and potential toxicity was underestimated.

93. Strychynine Insufflation in an Adolescent

West PL,1 Hendrickson RG.2 1Oregon Health and Science University, Portland, OR, USA; 2Oregon Poison Center, Portland, OR, USA.

Introduction: Strychynine poisoning is infrequently seen in the US. We present a classic case of strychynine poisoning with an unusual method of exposure that was initially misdiagnosed. Case report: A 14yo male found a white powder in a tin in the attic of a rental house. He sniffed the powder assuming it was cocaine. 15 min after insufflation, his muscles became stiff, he lost the ability to communicate and provide information after inection of the powder and was treated with benzodiazepines for muscle spasms. Lab evaluation showed a WBC of 25.3 and hypokalemia of 3.1 mmol/L (NL 3.5–5.1 mmol/L), CK elevated at 340 U/L (NL 0–170 U/L), and myoglobin elevated at 1013 (NL 25–72 ng/mL) but was otherwise WNL. UA was positive for blood, UDS neg for cocaine and amphetamines. Salicylate and APAP were neg. He was treated with low dose lorazepam therapy and discharged after mild symptom improvement. After discharge, confused about the powder to his mother, she returned home and found the tin of white powder was labeled “strychnine.” The patients had persistent nausea and spasms after discharge and returned to the hospital. Laboratories at this time showed an increasing CK to 2124, myoglobin was decreasing to 724 ng/mL. The patient was admitted to the hospital and given aggressive IV fluids. The CK peaked at 2228 IU/L and had declined to 2077 IU/L by 24 hours after ingestion. At this point, his respiratory rate was 20 per min, he was tachycardic and feverish as well. Blood tests revealed no electrolyte abnormalities. 22 hrs later, his myoglobin and CK was 373 and 884 IU/L respectively. The patient was intubated and transferred to the intensive care unit. The hospital stay on the pediatric intensive care unit was nearly 9 weeks. Studies included but not limited to electrocardiogram, arterial blood gas, and brain and metabolic screening. The patient was discharged home on Day 82. Discussion: Strychnine is a potent alkaloid that inhibits the inhibition of the release of GABA from nerve terminals. This results in increased excitation of muscles. Complications include hyperthermia and rhabdomyolysis. Though this case did respond to benzodiazepines, typically these do not significantly increase muscle tone than typical cases of muscle spasm. This case also serves as a reminder that ingestion histories should be obtained from caregivers. This case is presented to serve as an uncommon overdose for which clinicians should be vigilant.

94. A Retrospective Review of Maternal – Fetal Exposures in a Poison Control System

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Background: Surveillance of toxic exposures and patient management utilizing poison control center data offer unique opportunities for evaluating developmental toxicity in human pregnancy. Methods: A retrospective review of 931 pregnancy-related cases in a large poison control system for the year 2007 was performed, as part of an ongoing study. Exposure groups were divided into ≤ 20 years and ≥ 20 years of age, in those cases where this information was available. Of the 931 cases where age was known, 88 (9.5%) were in the ≤ 20 years group, 52.2% were treated in a health care facility, in contrast to the 27.3% in the ≥20 years group. No obstetrical evaluation was charted in 38% of the ≤ 20 years group, or in 26% of the ≥ 20 years group. Conditions of pregnancy, birth outcome, and follow up for both outcomes and improvement in risk assessment for exposures in pregnancy.

95. Methadone Overdose in a Breast-Feeding Toddler

West PL,2 McKewen NJ,1 Hendrickson RG.2 1Oregon Health and Science University, Portland, OR, USA; 2Oregon Poison Center, Portland, OR, USA.

Intro: Methadone’s use in breast-feeding mothers is generally considered safe. We present a child who became symptomatic after inection of maternal self-medicating with methadone. Case report: A 13 mo healthy, primarily breast-fed, male was treated for narcotic OD. The child’s mother ran out of her prescribed hydrocodone/APAP for carpal tunnel syndrome, and substituted 2 doses of methadone 40mg at (times 0 and 4 hrs). The child nursed at 6 hrs and at 10 hrs (for 45 minutes each) and fell asleep beside his mother for 45 minutes. No pills were available to the child. At 11.5 hrs, his mother awoke, noted decreased responsiveness and summoned EMS. EMS confirmed cyanosis, miosis, and bradycardia and BVM respiration was initiated. CBG was elevated. On ED arrival, the child was unarousable with normal vital signs. Narxalone 0.2mg IV was given with awakening. Lab evaluation was NL except for a UDS that was positive for opiates, with confirmation of methadone metabolites. At 18 hours, the child remained intermittently somnolent with O2 saturation dropping as low as 91%/RA, initiating treatment with his 4th dose of naloxone IV. He subsequently received 2 doses of naloxone IV with expected infant dose between 3.5-4.4% of the maternal dose in early lactation, which is generally considered a safe level. Most studies, however, are done on newborns with ongoing exposure to methadone, which is not the case with our child. Hydrocodone does cross into breast milk, but is a much less potent opioid at typical concentrations compared to methadone. This case highlights that it is unknown what constitutes an uncommon overdose for which clinicians should be vigilant.

96. The Utilization of a Social Networking Website To Increase Awareness of Poison Center Services

Michels JE, DeRienzo CA. Palmetto Poison Center, University of South Carolina, Columbia, SC, USA.

Background: Awareness of Poison Center (PC) services is a major component of PC public education programs. Poison prevention programs and materials have included information concerning poison-proofing homes, what to do in a poison emergency, and services PC can provide in a poison emergency. The traditional methods of approaching poison centers have included approaches to schools, businesses, health-fairs, and other community gatherings via face to face contact with PC staff. With increased internet usage, websites have improved the visibility of PCs and eased citizens’ access to information that has been previously provided through phone consultation and outreach programs. Case report: The PC wanted the ability to directly contact citizens in its designated service area. Facebook, a social networking website, allows organizations to design an informational group page free of charge. This PC uploaded its logo, general information concerning services, and its contact information has been provided to members of Facebook that were already members of Facebook contacted their friends and family to join. The PC, affiliated with a College of Pharmacy, sent a request to faculty, staff and students to become a member. Also, the PC’s website also provided information to join. Once an individual becomes a member of the group, messages and updates from the group page administrator are sent directly to the individual members e-mail inbox. Members are also able to post questions or statements to the organizational page for all members to view. Discussion: According to Facebook, there are over 3 billion active users a month. For half of these users, Facebook has become a part of their daily routine. For those users that are not already part of Facebook, it is unknown what percentage of these users will become a part of the group. This type of communication is able to reach a wide audience.

97. Sudden Sensorineural Hearing Loss Following Nasal Insufflation of Heroin

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Background: Sudden sensorineural hearing loss (SSHL) involving relapse use of IV heroin after abstinence period can be very sporadically reported. Documentation of serial audiogram (AG) data is extremely rare. Case report: A 47 yo female with reported history of heroin abuse presented to the emergency department (ED) via EMS after being found unresponsive by her family. She was last seen ~9h earlier. Narxalone 0.8 mg was given with arousal noted. On ED arrival, vital signs were: T 36.3°C, P 121, R 10, BP 87/61, SaO2 88%.
98. Chronic Carbon Monoxide (CO) Poisoning: Myth or Reality – A Systematic Review  
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1Rocky Mountain Poison & Drug Center-Denver Health, Denver, CO, USA; 2University of Colorado Denver School of Medicine, Aurora, CO, USA. 
Background: Chronic CO poisoning is an elusive diagnosis and poorly defined in published literature. The aim of this review is to ascertain the existence of chronic CO poisoning, define it, and describe the clinical presentation. 
Methods: A structured literature search (1950 to 2009) was conducted using PubMed, EMBASE, Cochrane Library, bibliographic reviews of articles and major toxicology textbooks, and contact with content experts. Search terms included “Carbon Monoxide Poisoning” and “Chronic OR “Subacute” OR “Occult.” We included articles published in all languages, human studies with reported health effects, and evidence of CO exposure. Two independent reviewers scanned all abstracts, did a structured evaluation on included articles using design-appropriate published criteria, and constructed evidence tables for encompassing development. 
Adjudication of differences was performed by both reviewers and a research consultant. Observational and experimental studies were evaluated separately to control for heterogeneity. 
Results: A total of 584 literature citations were screened. 28 articles met inclusion criteria. Of these, 20 articles met our quality requirements: 14 reported duration of exposure, 13 duration and either ambient CO or COHb concentrations, and 3 duration and both ambient CO and COHb concentrations. Intermittent exposure was described in 18 articles. Median exposure duration was 18 months (range 8 hours to 50 years). The lowest COHb and ambient CO concentrations associated with health effect were 2.5% and 10 ppm, respectively. Most common reported symptoms were headache, nausea, vomiting and dizziness. 
Conclusions: The majority of evidence supporting the existence of chronic CO poisoning were of fair quality. The best available data indicates that a COHb of 2.5% and/or intermittent exposure to as low as 10 ppm for a period ranging from 8 hours to 50 years can result in a spectrum of symptoms, mainly headache, nausea, vomiting and dizziness.

99. Kinetics and Metabolism of Diethylene Glycol in Rats  
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Diethylene glycol (DEG) overdoses, mostly through use of adulterated pharmaceuticals in unregulated countries, have been linked with kidney failure, hepatotoxicity, and peripheral neurological disease. Recent studies using fomapanzole (FOM) to block DEG metabolism confirmed that a metabolite of DEG, not DEG, is responsible for the acidoses and kidney and liver toxicity. The purpose of this study was to relate the kinetics of DEG and its metabolites with the development of toxicity to determine the responsible toxic agent. Wistar rats were treated in four groups: water (control), low dose DEG (2 g/kg), high dose DEG (10 g/ kg), or high dose DEG + FOM. Diabetic plasma Cmax values were 42 and 37 mmol/L for 10 g/DEG and DEG + FOM, respectively. FOM did not alter the rate of DEG elimination from plasma (%/h = 12.4 ± 1.9 h vs. DEG = 15.3 ± 2.6 h). A urine sample from each group was analyzed by HPLC for the presence of DEG and its metabolites. Urine from the rats treated with DEG had no 2-HEA in urine, confirming that FOM inhibited DEG metabolism completely. Urinary HEA levels correlated in a time- and dose-dependent manner with metabolic acidosis. Kidney and liver toxicity was observed at 10 g DEG and was prevented by FOM treatment. These results demonstrate that HEA is the only acetic acid metabolite in urine after toxic doses of DEG and thus accounts for the target organ toxicity of DEG. Fomapanzole blocks formation of HEA from DEG and HEA elimination in the urine, but does not alter DEG elimination from the plasma, suggesting that the latter is controlled by the rate of excretion of unchanged DEG in the urine. This project is supported by the American Chemistry Council.

100. Treatment with Polyvalent Antivenom in an Intoxicated Patient Bitten by Egyptian Cobra (Naja Annulifera)  
Fuentes JM, Halcomb SE, Washington University in St Louis, St Louis, MO, USA. 
Background: There has been a recent increase in the private collection of exotic venomous snakes in the USA. Specific antivenom is of paramount importance in reversing signs and symptoms of envenomation. Many hospitals in the USA are equipped with Polyvalent Crotalidae Immune Fab antivenom made specifically for snakes native to the USA. Obtaining specific antivenom for non-native snakes in the USA, usually requires help from zoos or the military. In this case report, we present an intoxicated male bitten by a cobra snake. 
Case report: A 28 year old male presented to the emergency department 4 hours after being bitten on the right leg by a cobra (Naja Annulifera). He decided to drink alcohol in order to ameliorate the pain, which led to confusion regarding his degree of envenomation. On arrival patient was lethargic, tachycardic, had hypotension, and was not able to intake fluids. There were cutaneous wounds on dorsum aspect of his right hand. Two vials of specific (Fab')2 antivenom were administered. Ethanol level was 420mg/dL. The patient was discharged 24 hours later, his swelling and erythema did not progress any further. Discussion: Cobra snake bites primarily produce neurologic effects, and death is usually due to paralysis of respiratory muscles. Discrimination and accurate notification of cobra envenomation can be a medical challenge. Attributing the symptoms and signs to alcohol and withholding specific antivenom treatment may lead to a fatal outcome. Once the species is identified as being non-native to the area, focus at obtaining specific antivenom is crucial, this usually involves activating expert personal in the field and local zoos. Based on the history of alcohol ingestion, antivenom serum, more recently clearance of the IgG molecule with pepsin or papaain to produce Fab(2) or Fab fragments respectively has reduced the incidence of anaphylaxis and systemic reactions. Conclusion: Cobra envenomation should be taken not to delay specific antivenom treatment in the intoxicated patient if envenomation is suspected. Further research and funding is needed in this area. Shoebite envenomation with longer shelf life to make these products easily available.

Disclosure: This is a case of heroin associated SSNHL with persistent deficits on follow up AG at 3 months. However, a repeat AG 3 mo later indicated normal hearing on the left, but the right ear showed mild hearing loss in the range of 250-500 Hz, normal hearing at 1000-4000 Hz, and mild hearing loss at 4000-8000 Hz. There was slight asymmetry of 10 dB in the lower frequencies, with the right ear poorer. Brain MRI was normal. Peak CK and creatinine were 920U/L and 2.2 mg/dL, respectively. On hospital day 4, the patient was discharged on prednisone for SSNHL. At 1 wk follow up, the patient reported her hearing loss had largely resolved. However, a repeat AG 3 mo later indicated essentially normal hearing on the left, but the right ear showed mild hearing loss in the range of 250-500 Hz, normal hearing at 1000-4000 Hz, and mild hearing loss at 4000-8000 Hz. 
Case discussion: The pathophysiology of heroin associated SSNHL and the role of adulterants has been unexplored. Heroin can be inhaled, injected, or insufflated, with the right ear poorer. Brain MRI was normal. Peak CK and creatinine were 920U/L and 2.2 mg/dL, respectively. On hospital day 4, the patient was discharged on prednisone for SSNHL. At 1 wk follow up, the patient reported her hearing loss had largely resolved. However, a repeat AG 3 mo later indicated essentially normal hearing on the left, but the right ear showed mild hearing loss in the range of 250-500 Hz, normal hearing at 1000-4000 Hz, and mild hearing loss at 4000-8000 Hz. 
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103. Mortality after Suicidal Ingestion of Aluminum Phosphate

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Aluminum phosphate (AP) is pesticide commonly used in Southeast Asia and is the second leading agent involved in suicides in India. When AP comes into contact with water or hydrochloric acid, phosphine gas is generated. Phosphine is a powerful oxidant and an inhibitor of cytochrome c oxidase in the electron transport chain. This leads to muscular cellular toxicity, metabolic acidosis, adult respiratory distress syndrome and frequently death. Currently there is no antidiote for aluminum phosphide toxicity.

A 50 year-old Indian man presented to the emergency department (ED) one hour after intentionally ingesting 3 unknown pellets. Initial symptoms included nonbilious vomiting and abdominal pain. He had no past medical history and denied use of illicit drugs, tobacco or alcohol. Vitals upon arrival were BP=130/90 mm/Hg, HR=110, RR=18, O2 sat 97%, and afebrile. Physical examination was only remarkable for epigastric tenderness. ECG revealed sinus tachycardia with normal QRS and QTc intervals and no evidence of Na+ channel blockade. 30 minutes after arrival to the ED, he became confused, hypotensive, bradycardic, and tachypneic. HIS complete blood count was within normal limits. Na+ 140 K+ 3.5 Cl- 100 CO2 14 (mmol/L) BUN 20 creatinine 1.3 and glucose 100 (mg/dl) with an anion gap of 26. Serum lactate was 10 (mmol/L). Clostridium septicum grew out of the wound after 18 hours. His complete blood count (25%) and phonebook (12%) were the sources for the number for those exposed at the workplace (n = 73). Discussion: Although the data collection categories were well defined, coding by multiple data collectors (reliability) may be a limitation. These data identify target populations for magnet/ sticker distribution. Conclusion: Many households have a magnet/sticker available demonstrating that education efforts have been effective. However, it is clear the phone book still plays a significant role in obtaining the PC number for certain populations. Education efforts targeting these populations and settings may increase the percent of callers utilizing a magnet/sticker.

104. Sotalol Induced Torsade de Pointes and Enhanced Elimination with Hemodialysis

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Sotalol is a nonselective β-blocker and a Class III antiysdysrhythmic with the potential to cause torsade de pointes (TdP). TdP is most common in patients taking sotalol who have renal failure or are taking other drugs that prolong the QTC interval. Sotalol exhibits minimal protein binding and has a volume of distribution of 15L/kg. It is nearly entirely renally eliminated and its half life can be prolonged to over 100 hours in people with renal insufficiency. We present a case of a patient with end stage renal disease started on sotalol who developed refractory TdP and was treated successfully with hemodialysis.

A 78 year old male with a PMHx of hypertension, coronary artery disease, end-stage renal disease on hemodialysis was admitted to the hospital for colitis. During his hospital stay, the patient developed atrial fibrillation with rapid ventricular response which responded to diltiazem. Cardiology consultation was recommended and the patient was discharged on oral amiodarone (80mg orally twice daily). After five days of sotalol initiation the patient had an episode of pulseless ventricular tachycardia and TdP. Pt. was intubated, given 2 grams of sodium bicarbonate, and restored to sinus rhythm with a bolus of a perfusing rhythm. Electrocardiogram revealed a sinus bradycardia with a QTC interval of 618msec and laboratory analysis revealed a serum K+ 5.1 Mg2+ 2.4 Ca2+ 1.0. Shortly after, he had several further episodes of TdP that was refractory to defibrillation, transvenous pacing, lidocaine 100mg bolus, and further Mg2+ supplementation. Pre-hemodialysis (HD) assessment was initiated that same day for 4 hrs. After completion of HD, patient had no further episodes of TdP and was hemodynamically stable. Predialysis sotalol serum level was ~2000ng/ml (laboratory was unable to dilute due to highly elevated concentration) and the level post dialysis was 2475ng/ml (therapeutic 1000–2000ng/ml). This case demonstrates that sotalol dosing must be carefully monitored in patients with renal impairment and elimination can be enhanced with hemodialysis.

105. Validation of Self-Reported Drug Use by MSM

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Background: Drug use in high-risk venues is associated with increased risk of HIV transmission in men who have sex with men (MSM). A reliable means of identifying drug use is self-report. For personal use only.

Methods: We screened 19,795 MSM for participation in a survey evaluating drug use. Each participant was initial- ly asked if they had used a drug at any time in the past month. They were then asked separate questions to identify specific substances: cocaine, heroine, amphetamine, and ecstasy. We developed a survey tool to assess the validity of self-reported drug use. UsingGCMS analysis results and self-reported drug use for concordance. We report that MSM in our study sample accurately described their drug use. This research is important because virtually all drug policy in the US—and commu- nity-based prevention programs—have been based upon self-reported drug use. In light of these results, the reliance upon self-reported drug use appears appropriate. This investigation was supported by NIH grant RO1 DA-18572.
rates were 25–34 Yrs (9.2), 35–44 Yrs (10.5) and 45–54 Yrs (12.9); with these 3 groups totaling 73%. Blacks (6) had a similar overall rate as Whites (5.8), which were 2.6x Other (13.3) race concerning the study. It dropped in late 90’s but rose dramatically to 2005. Overall unintentional poisoning deaths (57%) were more prevalent than suicide (31%) and undetermined (11%). The rate of unintentional poisoning deaths increased 3.5x from 1991 (2.3) to 2005 (8). There were 2,378,720 unintentional injury deaths with the 5 leading causes: MV (43%), falls (12%), poisoning (10%), drowning (5%) and suffocation (5%). While unintentional deaths trends for drowning and suffocation remained flat, they fell for MV traffic and increased for poisonings and falls. The rate of unintentional poisoning deaths increased dramatically in US since 1990 with unintentional poisonings responsible for most of the increase. Poisoning becomes the second most prevalent cause of injury deaths in the US since 2003 and should be a major focus of injury and poison prevention programs.

108. Titration of Hyperinsulinenia Euglycemia Therapy for Acute Diltiazem Toxicity

Cuminston KL,1,2 Rose SR.1,2

Introduction: depending on each clinical situation and type of withdrawal. Attempts to wean HIE combined with treatment with vasopressin infusions, his MAP remained 40–50 mm Hg. A bolus of 80 units (1.0 units/kg) of regular insulin was ordered to titrate upward 0.5 units of R/kg every 30 minutes later the R was at a rate of 280 units/hr and the MAP was 45 mm Hg and HR 90 bpm. Fourteen hours hours later the R was at a rate of 360 units/hr and the MAP was 40–50 mm Hg. A bolus of 80 units (1.0 units/kg) of regular insulin was ordered to titrate upward 0.5 units of R/kg every 30 minutes later the R was at a rate of 280 units/hr and the MAP was 45 mm Hg and HR 90 bpm. Fourteen hours

109. Severe Neurologic Injury after Benzonatate Induced Cardiac Arrest

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Introduction: Benzonatate is a local anesthetic used as an antitussive. Published case reports of overdose are few, toxicity is rapid and severe, and treatment options remain only supportive to date. Case report: A 20 year-old depressed man had a tonic-clonic convulsion and an episode of agonal respirations and a weak pulse. Pupils were dilated and unreactive and he was incontinent of urine. En route to the emergency department (ED), the patient went into a pulseless ventricular fibrillation arrest and was shocked twice (360J), given 1mg epinephrine intravenously, and intubated. He subsequently converted into sinus tachycardia. In the ED, BP: 101/72 P: 123 bpm. Fifty grams of activated charcoal were given orally as well as gastric lavage. Results: 298 mins. QT 298 ms. ABG: 7.21 pCO2 48.1 HCO3 18.8 po2 86, sao 94.2% (70% FiO2) Labs: Na 132, K 4.1, Cl 96, HCO3 20, Glu 321, Cr 1.9. Toxicology screen were negative. The head CT was negative. An EEG demonstrated severe bitemporal dysfunction consistent with anoxic injury. While in the intensive care unit (ICU), the patient remained hemodynamically stable and experienced no further cardiovascular compromise. On hospital day 14, a tracheostomy tube was placed and long-term care was planned. He never regained consciousness and died after 10 days. A urine benzonatate level of 13 mcg/mL was obtained (min. detection level 0.5 mcg/mL, high performance liquid chromatography). Discussion: Chemically similar to tobacco, benzonatate is a synthetic nespiras, dysphagia, and cardiac arrest. Absorption is rapid following ingestion. Six total cases have been reported, all of whom suffered cardiac arrest, with 1 successfully resuscitated. The four deaths included 2 toddlers and 2 adults. In one case, an adult injected the contents of 2-3 perles, ultimately resulting in brain death. Conclusion: We report a rare case of benzonatate toxicity with cardiac arrest resulting in severe anoxic injury.

110. Board Certification and Recertification in Medical Toxicology: The First 12 Years

Wax PM.

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Background: Beginning in 1994, physician board certification (BC) in Medical Toxicology (MT) has been available through the American Board of Medical Specialties (ABMS). Certification is required to 10 years. More than 3 of 4 MT diplomates have achieved BC in EM. BC in MT. As of March 2009, data was only available on physicians who initially certified in the mid 1990s (including many who were already at mid-career), 2 of 3 recertified physicians who achieved BC in 1996, 30 (65%) were recertified in 2006. Of the 49 physicians who achieved BC in 1996, 30 (65%) were recertified in 2006. Conclusions: Since FT training was required to take the MT exam, about 40 physicians first become BC in MT during each biennial exam cycle. Of the MT BC physicians who initially certified in the mid 1990s (including many who were already at mid-career), 2 of 3 recertified after 10 years. More than 3 of 4 MT diplomates have BC in EM.

111. Ingestion of Ricin Seeds from a Castor Bean Plant

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Background: Castor Bean (CB) plants have become more widely available as attractive ornamentals. We report a patient who chewed several CB seeds which were inadvertently mistaken for peanuts and developed mild gastrointestinal effects. There is an increased need for education on castor bean toxicity with the increased use of this plant. Case: A 47 year-old male mistakenly chewed 2 CB seeds that were placed in a dish waiting to be strung into a necklace. The patient had received the CB plant as a gift by a colleague and was allergic to peanuts. The patient was admitted 90 mins after ingestion and had an episode of vomiting on day 2. The duration of the diarrhea lasted for 3 days and oral maintenance fluids was the mainstay of his treatment for the 3 days. He reported a strong fear of the plant after witnessing on-going severe toxicity and death has been reported from the ingestion of 1 chewed seed in a child, this case is similar to other case reports in adults who have survived ingestions. The four deaths included 2 toddlers and 2 adults. In one case, an adult injected the contents of 2-3 perles, ultimately resulting in brain death. Conclusion: We report a rare case of benzonatate toxicity with cardiac arrest resulting in severe anoxic injury.

112. Mechanism of Toxicity of Cleistanthus Collinus: Vascular H+ ATPases Are a Putative Target

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Background: Ingestion of Cleistanthus collinus, a shrub native to India, either accidentally or intentionally, is a major cause of death in Southern India. Intake of a boilied decoction of leaves is highly toxic and medical management is mainly supportive due to lack of information on molecular mechanisms of toxin action. Since distal renal tubular acidosis is one of the symptoms of poisoning, and ATP requiring proton pumps are important for acid secretion in kidney, we hypothesized that these may be putative targets for C. collinus. Results: Kinetics of intrinsic membrane proton pump (BBM) isolated from wistar rats as well as cultured liver and kidney cells were exposed to aqueous extract of C. collinus. V–H+ATPase & proton pumping activity were then evaluated using spectrophotometry. Acidification of intracellular organelles and protein levels of V–H+ATPase in cells were examined by acridine orange staining and western blotting respectively. Results: In vitro exposure to C. collinus results in significant inhibition of V–H+ATPase activity in renal BBM as well as block of proton pumping in renal BBM vesicles. C. collinus extract was also found to inhibit the development of intracellular organelles in cells in culture, accompanied by a decrease in V–H+ATPase activity but increase in protein levels. The effects of C. collinus extract were comparable to those seen when cells were preincubated with bafilomycin or concanamycin; specific inhibitors of the V–H+ATPase. Discussion & Conclusion: These results demonstrate that the vascular H+ATPase in renal cells is a putative target for the toxins in C. collinus and the inhibition of this important proton pump probably plays a role in development of the distal renal tubular acidosis and subsequent renal failure seen in poisoned patients. By-passing this block and examining approaches to sustain proton pumping in the kidney would be a rational approach for management of patients with C. collinus poisoning.
dehydrogenase (ADH) and produces similar effects to GHB when ingested. We hypothesized that 4-MP, an ADH blocker used to treat toxic alcohol ingestions, would block the conversion of BD to GHB and might alter the nature of the intoxication. Methods: Consented, healthy volunteers with minimal past GHB exposure (3 males, 3 females) participated in this blinded, randomized, 2 arm crossover study of BD preceded by 4-MP (one arm) or placebo (other arm). Vital signs, subjective effects, and plasma were collected at baseline and 15, 30, 45, 90, 120, 180, 240, 360, and 1020 min post dosing. Plasma was analyzed by GC-MS for BD and GHB (LOQ 1 and 5 mcg/mL, respectively). Statistics included WinNonLin and paired t Tests. Results: BD was rapidly metabolized to GHB in the placebo arm, with peak 30 min. BD was not detectable above 5 mcg/mL in either arm after 180 min. There were no significant differences in vital signs, O2 saturation or subjective effects between the 2 arms. Conclusions: We clearly demonstrate that ADH is a major pathway for the conversion of BD to GHB. It is unknown if 4-MP incompletely blocks metabolism of BD to GHB via ADH because the ADH pathway can also be converted to BD. The effects of BD and GHB ingestions were similar even when BD conversion to GHB is substantially inhibited. Further investigation of the ADH role in BD metabolism and GHB toxicity may be warranted. NIH Supported: DA 014935, GM007546

114. Dichlorvos- and Methomyl-Induced Respiratory Toxicity Results from Central Muscarinic Effects Baud FJ, Houze P, Levy G, David A. 1 Medical and Toxicological Critical Care Department - Lariboisière Hospital - University Paris 7, Paris, France; 2 Toxicological Laboratory - University Paris 5, Paris, France. Objectives: The mechanisms of anticholinesterasic intoxication on respiratory toxicity are still unclarified. We previously showed atropine (A) but not methylatropine (MeA) induced the correction of paroxon-induced respiratory toxicity. The aim of this study was to assess the effects of dichlorvos (D) and methomyl (M), 2 carbamates, on the respiratory rate induced by another organophosphate, dichlorvos (D), and a carbamate, methomyl (M). Methods: Male Sprague-Dawley rats were poisoned using D (5.76 mg/kg, i.p.; 45% of the sc MLD) or M (2.3 mg/kg, i.p.; 50% of the ip MLD). Poisoned rats were treated with A (base: 10 mg/Kg-1) or equimolar MeA (base: 5.42 mg/Kg-1) by intramuscular injection at the time of maximal respiratory effects, 5 min post injection of D or M. Respiratory function was assessed using whole body plethysmography and central temperature using infrared thermometry. Results are expressed as mean ± SEM. Statistical analysis used parametric tests with p < 0.05. Results: In rats with intraperitoneal injection, greater dose of D or M than about 50% of the MLD resulted in respiratory toxicity, but D did not induced a significant decrease in core temperature. D and M induced a decrease in respiratory rate resulting from an increase in expiratory time. M but not D increased the tidal volume. The onset of respiratory toxicity occurred 5 min after injection for both D and M. The decrease in respiratory rate induced by D and M lasted 20 and 30 min, respectively. A (10 mg/Kg-1) completely reversed the D- and M-induced respiratory toxicity while an equimolar dose of MeA (5.42 mg/Kg-1) was without significant effects. Discussion: A crosses the blood-brain barrier and induces peripheral and central muscarinic effects while an equimolar dose does not cross the blood-brain barrier only resulting in peripheral effects. In addition to paroxon, our study showed that A resulted in the complete correction of D- and M-induced respiratory toxicity. In contrast, MeA did not induce any significant effect. We conclude the respiratory toxicity induced by anticholinesterasic insecticides including paraxon, dichlorvos, and methomyl at dose about half the MLD results from effects mediated by central muscarinic receptors.

115. Early Elevation of Interleukin-6 Concentration in the Cerebrospinal Fluid Is a Predictive Marker of Delayed Encephalopathy from Carbon Monoxide Poisoning Ide T1, Kamijo Y2, Ide A, Yoshimura K2, Nishikawa T2, Soma K2. 1Department of Neurology, Kitasato University School of Medicine, Kanagawa, Japan; 2Department of Emergency and Critical Care Medicine, Kitasato University School of Medicine, Sagamihara, Kanagawa, Japan. Background: Delayed encephalopathy (DE) may occur after carbon monoxide (CO) poisoning, but a patient’s initial presentation does not predict later outcomes with certainty. Purpose: We investigate whether early elevation in interleukin-6 (IL-6) in the cerebrospinal fluid (CSF) may be a predictive marker of DE. Methods: Nineteen patients who were admitted to our hospital from Nov 2006 to Sep 2008 with conscious loss from CO poisoning or CO-Hb > 25%, and who agreed to have repeated CSF analysis were enrolled. We measured IL-6 concentrations after hyperbaric oxygen (HBO) therapy were included in this study. The CSF and serum were simultaneously sampled within 24 hours after final exposure to CO and then every week, and they were immediately frozen at -80°C for analysis. IL-6, neuron specific enolase (NSE), and lactic acid (LA) in both CSF and serum and MBP concentration were determined. Results: Among the patients, IL-6 concentrations in the CSF were significantly higher than those in the group non-DE (P = 0.015). No significant differences were found between two groups in the initial NSE and LA concentrations in both serum and CSF and in the initial MBP concentrations in CSF. Discussion: We previously reported that myelin basic protein (MBP) level in the CSF was markedly elevated preceding the clinical manifestation of DE. However, MBP concentration was not yet elevated in the initial phase of DE. Therefore MBP concentration cannot predict the development of DE in the early phase of CO intoxication. CSF IL-6 concentrations in the CSF may relate with the degree of cerebral injury and the development of DE, although the mechanism remains unknown. Conclusion: Early elevation of IL-6 concentration in the CSF may be a predictive marker of DE from CO poisoning.

116. Estimation of Melamine Intake by Chinese Infants Thomas JD, Skinner CG, Mortensen ME, Osterloh JD. Centers for Disease Control and Prevention, Atlanta, GA, USA. Background: High doses of melamine may lead to kidney stones and renal failure. Recent infant formula contamination affected thousands of Chinese infants, and 6 deaths were reported. Infants consuming infant formula are at risk since their entire intake is from one food source. Methods: We calculated the amount of melamine an infant might ingest based on the available reported amounts in infant formula from China, Canada, and the United States. Formula doses were based on mean daily requirements for infants of 1, 3, and 6 months of age. The weight of formula needed to meet those requirements is 22.8g/day, 18.6 g/day, and 17.8 g/day, respectively. The highest reported concentration of melamine found in infant formula was 6197 ppm from China, 0.346 ppm from Canada, and 0.140 ppm from the U.S. (only 1 of 89 U.S. products had measurable levels). Results: The highest concentrations of melamine in infant formulas tested and predicted intakes are shown in the table. Discussion: For infants, the US FDA set tolerable daily intake (TDI) levels for melamine at 1 ppm in food sources or 0.063 mg/kg-bw/day. The possible amount of melamine ingested in June was 3.8 (n = 8). The highest daily number of calls was exceeded 17,000 times that of the highest measurable levels in the U.S. and Canada. The amount ingested from Chinese formula helps to explain some of the clinical symptoms associated with this toxic ingestion. (Note: the actual amount of melamine based on reported values from Chinese formula was massive compared to background amounts in U.S. and Canadian formula. This helps to explain many of the health effects these children experienced.)

117. Poison Control Center Calls Relating to Salmonella Serotype Saintpaul Outbreak in April-August 2008 Forrester MB, Department of State Health Services, Austin, TX, USA. Background: On June 3, 2008, the Food and Drug Administration (FDA) and media reported a food poisoning outbreak involving Salmonella serotype Saintpaul. The outbreak occurred during April–August 2008. The outbreak was initially associated with tomatoes; however, around July 6, 2008, an association with jalapeno peppers was reported. This study describes the calls to poison control centers received as a consequence of this outbreak. Methods: Data were obtained from 6 poison control centers. The mean daily number of reported food poisoning cases was 20.2 for each month from March–July 2008. In addition, all calls received during March 1–September 1, 2008, were reviewed to identify those calls specifically pertaining to the outbreak and evaluated with respect to the date of the call and food mentioned. Results: The mean daily number of reported food poisoning exposures was 3.9 for March, 3.5 for April, 3.4 for May, 5.1 for June, and 3.9 for July. A total of 133 calls (57 potential exposures, 76 information requests) specifically pertaining to the outbreak were identified. The first calls were received on June 3 (n = 8). The highest daily number of calls was received on June 11 (n = 14). Calls continued to be received through August 3. Tomatoes were the food mentioned in all calls received prior to July 6. Tomatoes continued to be associated with calls received for a few more days. Peppers began to be associated with the outbreak calls on July 7, and after a few days became the only food mentioned in the outbreak calls. Discussion: The food poisoning outbreak did not appear to result in calls to poison control centers until after the FDA and media reported the outbreak. Calls immediately began to be received by the poison control centers, with calls continuing to be received for several months. The food associated with the calls depended on what was reported in the media. Conclusions: Poison control center data may currently be of limited usefulness as a surveillance source for detecting food poisoning outbreaks because the poison control centers might receive calls only after the outbreak is announced.
118. A Gargantuan Acetaminophen Level in a Patient Treated Solely with N-Acetylcysteine
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Complications from enormous acetaminophen (APAP) ingestions treated with various therapeutic modalities are well known. We believe that the following patient presented with the largest single ingestion of APAP. She was treated solely with IV N-acetylcysteine (NAC) with a successful outcome.

A 39 yo female with a history of depression was found in a pool of blood with a suicide note. In the ED she was obtunded with agonal respirations and immediately intubated. Vital signs were HR 81 bpm, BP 93/53 mmHg, T 88°F rectal, RR 12 on ventilator. The patient had self-inflicted slash marks on her neck and forearm. EKG showed a sinus rhythm with nonspecific ST/T wave changes and a slightly prolonged QTc. Activated charcoal was given via NG tube.

ABGs were pH 6.9, pCO2 547, pCO2 13, base excess < -30, lactate 22. IV NaHCO3 was started. The BMP was significant for bicarbonate of <5, BUN 15, and creatinine 1.3. LFTs showed total bilirubin 0.9, AST 103, ALT 74 and ALP 303. Fomepizole was administered for possible toxic alcohol ingestion until levels were negative. There was no response to naloxone. There were no apparent co-ingestants. IV fluids were started for 32 hours followed by a 4 liter IV fluid challenge over the next 24 hours.

Early coma and metabolic acidosis are associated with enormously elevated APAP levels. A significant correlation has been found between the degree of early hyperlactatemia and increasing APAP levels in the absence of hepatic failure. This patient is unique in that she had the highest reported APAP level treated solely with N-acetylcysteine and survived.

The patient had a temperature of 90.1°F, a heart rate of 55 bpm, blood pressure of 80/50, respiratory rate of 23 breaths per minute, and a PaO2 of 222 mm Hg. An O2 saturation of 99%, and bicarbonate of 9 mEq/L. The arterial blood gas showed a pH of 6.82, a pCO2 of 518 mm Hg, an O2 saturation of 100%, and a bicarbonate of 9 mEq/L. A carboxyhemoglobin level was 0.4%. 40 minutes after hydroxycholamin administration, vasopressors were discontinued. Arterial blood gas demonstrated a pH of 7.32 and a bicarbonate of 9 mEq/L. Nephrology attempted dialysis but failed. The patient was intubated and given sodium bicarbonate and fluids. The patient had self-inflicted slash marks on her neck and forearm. EKG showed a sinus rhythm with nonspecific ST/T wave changes and a slightly prolonged QTc. Activated charcoal was given via NG tube.

120. Neonatal Hemolysis Associated with Nursing Mother Ingestion of Arnica Tea
Miller AD,1,2 Ly BT,1,2 Clark RF.1,2
1University of California San Diego Medical Center, San Diego, CA, USA; 2VA San Diego Healthcare System, La Jolla, CA, USA.

A 9 d/o term male, from an uncomplicated delivery, presented with 1 day of lethargy, decreased intake and jaundice. No fevers, vomiting, diarrhea, or URI symptoms were reported. The child was breast-fed and on no medications. An initial serum APAP level was 4.1mg/dl, with total bilirubin was 4.1mg/dl direct. The hemoglobin was 5g/L. The mother had started drinking a tea made from Arnica flowers 48 hrs prior to the onset of symptoms. She was transferred to the NICU for observation. The child was worked up for a possible drug induced anemia, but was unremarkable and that she was not on any medications other than ibuprofen (which has not been associated with neonatal hemolytic anemia). There was no maternal-fetal blood incompatibility. The baby’s screening G6PD level was normal. Workup for other common causes of neonatal jaundice including infection was negative.

The child was exchange transfused twice which lowered the bilirubin to 9.9 and corrected the child’s anemia. The bilirubin lowered to normal after phototherapy. The mother stopped drinking the implicated tea and the child resumed breast feeding without any further hemolysis.

There are reports of neonates with G6PD developing hemolysis after their mothers have taken sulfisoxazol and Fava beans. A Pubmed search for herbal medicaments causing hemolysis in non-G6PD children did not reveal any results.

Arnica Montana Extract is an extract of dried flower heads of the plant. It is most often applied topically to soothe muscle aches, reduce inflammation, and diminish lachrimal and lacrimal bruising. Arnica in herbal form is primarily used for treatment of bruises, sprains, contusions. Extraction machines which could delay the initiation of this treatment modality in the severely acidic patient.

121. Vision Loss in a Patient with Metformin-Associated Lactic Acidosis
Kreshak AA,1,2 Clark RF.1,2
1University of California San Diego, San Diego, CA, USA; 2California Poison Control System, San Diego, CA, USA; 3VA Medical Center, San Diego, CA, USA.

The use of metformin is contraindicated in patients with renal insufficiency, as determined by creatinine concentration or creatinine clearance. Metformin-associated lactic acidosis (MALA) can occur when renal function is impaired and metformin accumulates in the body. Symptoms of MALA are varied and have rarely included vision loss. Case report: A 67 year-old asymptomatic female presented to our emergency department with a complaint of acute vision loss. She had recently been started on metformin for treatment of diabetes mellitus type 2. In the emergency department, the patient had a temperature of 90.1°F, a heart rate of 55 beats per minute, a blood pressure of 117/94mmHg, and respiratory rate of 34 breaths per minute with a pulse oximeter reading of 98% on room air. On neurological exam she was awake and alert and was answering questions. Her pupils were mid-sized and reactive, and she was only able to see “black” despite lying under bright lights. She followed simple commands. She had no other abnormal neurological findings. Laboratory evaluation revealed a severe lactic acidosis (pH 6.65, lactate 19.9 mmol/L). Creatinine concentration was 7.0mg/dL (baseline creatinine 1.3mg/dl). Her metformin concentration was 28mcg/mL. Methanol, formic acid, ethylene glycol, pyroglycine and salicylate concentrations were negative. Her head CT was unremarkable. She underwent hemodialysis and had resolution of her lactic acidosis and vision loss. Conclusions: Anecdotal reports in the literature suggest that MALA can present with a variety of clinical findings, rarely including vision loss. A thorough evaluation of a patient’s renal function, beyond serum creatinine concentrations, is essential prior to initiation of metformin therapy.
abstracts, like naloxone. 6) Decreasing the use of pre-
scription opioids with interacting agents. 7) Developing
prescription monitoring programs.

123. Snake Bite: Our Experience at a Tertiary
Care Centre in North Western India
Bhallam P, Kumar N A, Singh S, Simpson I, Mahi S, Sharma N.
Post Graduate Institute of Medical Education and Reserch,
Chandigarh, UT, India.
Background: Snake bite is a common problem in North
West India. However the nature of snake remains spec-
ulative in the absence of a venom detection method.
Aims and objectives: Aim was to know the
pattern of envenomation based on the clinical symp-
toms. An attempt was made to identify the dead snakes
brought in by the victims.

Methods: All consecutive patients with snake bite admitted to the
Emergency from July 2007 to December 2008 were
included. The victims were encouraged to bring in the
dead snakes for identification and were examined by a
specialist. Patients were confirmed to have been bitten
by a particular species; by identifying the dead snake,
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128. Lead Toxicity in an Extended Pakistani Family from a Dietary Source
Roche KM,1 Sauhoff M,2 Maryann L,1 Buzetta A,1 Charles M,1,2 1Connecticut Poison Control Center, University of Connecticut Health Center, Farmington, CT, USA; 2Manchester Health, Manchester, CT, USA; 3Hartford Hospital, Hartford, CT, USA; 4Connecticut Department of Public Health, Hartford, CT, USA.

Background: Routine pediatric blood screening for lead remains the predominant method for detecting environmental pediatric lead poisoning. Adult screening is limited to occupational exposures or clinical symptoms. We report significantly elevated blood lead levels (BLLs) in a Pakistani extended family most likely related to consumption of food prepared with culturally accepted spices/food colorings used in their cooking. Exposure has now extended to family members in two states with potential for widespread cultural health concerns.

Case report: A preschool physical exam revealed a toddler’s elevated BLL (105 μg/dL) and ultimately uncovered pervasive lead poisoning among members of a family living in two states. Over an eight month period, all but one member (a formula-fed infant) of six adults and two children had repeated significant elevations of BLLs ranging from 24.9 to 105 μg/dL. BLLs were correlated with persistently high lead levels despite removal of the spices and orange powder from the home. Symptoms reported by the initial family members included: difficulties with concentration and memory, constipation, abdominal pain, and weakness. One experienced anemia (BLL 80 μg/dL) which resolved following chelation; another suffered a miscarriage (BLL 51 μg/dL). Seven relatives in another state were found to have elevated BLLs (26 to 36 μg/dL).

Investigation of the lead source continues with extensive collaboration of health professionals from several states.

Conclusion: Our case report highlights the need for cultural education. Each family member was given a study guide with references to its appropriate toxicology reference. Electronic learning methods were also utilized. A weekly toxicology topic was assigned for 23 weeks and a group of 10 questions and answers on average were emailed to all candidates and mentors. One file included questions only and a second file included the appropriate answers with rationale. All answers were referenced to its appropriate toxicology reference. These questions served as a forum for ongoing discussion and education between the candidate and mentor.

129. A Poison Center’s Role in Care for Disaster Evacuees
Schaeffer SE, Hommel H, Blackwood R. Oklahoma Poison Control Center, University of Oklahoma College of Pharmacy, Oklahoma City, OK, USA.

Background: In the event of a disaster, natural or man-made, there is a significant likelihood that a portion of the populace will require evacuation. With ready access to medical professionals on a 24-hour basis, PCCs are well-situated to provide services beyond care of the poisoned patient. In addition to basic needs such as shelter and food, necessary assistance for evacuees will include pharmacy and nursing services. The logistics involved in such an incident can be overwhelming, therefore adequate planning is crucial. Problem: In the fall of 2008, Hurricane Gustav threatened the Gulf Coast of the United States. Evacuation of inland facilities was initiated; evacuees were transported to several inland shelters and health care facilities. Early in the incident it was determined by command staff in our state that adequate preparation for the establishment of pharmacy services had not been made. Solution: Based upon previous interactions with the PCC, the state Chief of Nursing and Incident Operations Chief, who was tasked with establishing a medical clinic, contacted the pharmacy for assistance. The College of Pharmacy, which administers our PCC, also operates a retail pharmacy; the combination of 24-hour pharmacist availability and access to necessary medications was ideal for the rapid deployment of a pharmacy to the shelter. PCC pharmacists, in conjunction with Medical Reserve Corps (MRC) volunteers, provided medical pharmacy when not engaged in PCC duties. An additional service provided was the establishment of a basic formulary of low-cost medications with multiple indications. After the event, the PCC participated in “hotwash” sessions with incident command staff to identify opportunities for improvement and future cooperation. Discussion: Pharmacists from the PCC were instrumental in the establishment of pharmacy services on short notice. In this event strengthened the Center’s bond with our state health department. Because of the performance of PCC personnel in a real-time situation with many of the characteristics of a disaster, PCC has been invited to participate in additional projects throughout our region. In the future, should circumstances dictate, PCC nursing staff, as well, will be afforded the opportunity to augment the services of the MRC.

130. Comparison of the Effects of “Z-drug” Overdose
Miller AD,1,2 Maybury MH,1 Kim E,3 Nguyen LM,3 Bu KN11,2 Clark RF,1,2 Cantrell FL,1,2
1California Poison Control System, San Diego, CA, USA; 2UCSD Medical Center, San Diego, CA, USA; 3UCSF School of Pharmacy, La Jolla, CA, USA.

Objective: To describe and compare the incidences of overdose, the different clinical effects and outcomes related to consumption of food prepared with culturally relevant food products, and the potential cultural health problem. Further investigation is warranted.

Method: The study design included a retrospective chart review of the MRC for a 4yr(2004-2008) period. Investigations of the lead source continues with extensive collaboration of health professionals from several states.

Conclusion: Our case report highlights the need for cultural education. Each family member was given a study guide with references to its appropriate toxicology reference. Electronic learning methods were also utilized. A weekly toxicology topic was assigned for 23 weeks and a group of 10 questions and answers on average were emailed to all candidates and mentors. One file included questions only and a second file included the appropriate answers with rationale. All answers were referenced to its appropriate toxicology reference. These questions served as a forum for ongoing discussion and education between the candidate and mentor. Two weeks prior to the examination, the candidates were given roundtable discussions and lectures on various toxicology topics from a team of current CSPI’s to boost their self-confidence and knowledge. Evaluation: Evaluation of the effectiveness of the educational initiative was performed and was overwhelmingly positive. Conclusion: CSPI educational initiatives significantly improved pass rates of Specialists in Poison Information. Over a four year period, pass rates increased profoundly from 0% to 75% for first time test takers following the initiation of the CSPI Education. Regional poison centers can improve the pass rate of the CSPI examination by initiating a CSPI Education program.

131. Education Initiatives for the Certified Specialist in Poison Information Examinee
Behrman AD, Goetemooiër SL Cincinnati Drug and Poison Information Center, Cincinnati Children’s Hospital Medical Center, Cincinnati, OH, USA.

Background: In an effort to improve pass rates on the Certified Specialist in Poison Information (CSPI) examination, various methods of education were instituted. Prior to this initiative, examinees primarily studied on their own accord. Methods: The CSPI education initiative for examinees included three main areas in preparation to its success: (1) mentorship, (2) study guides and (3) roundtable discussions and lectures. Every examinee was assigned a one-on-one mentor for the 6 month period prior to the examination. When possible the candidate was paired with non-CSPI candidates. The role of the mentorship was used as a way to provide encouragement, knowledge and support to the examinee. Each examinee was given a study guide with information on toxidromes, decontamination techniques, symptoms expected with exposure, toxic doses and typical treatment recommendations including antidote information. Electronic learning methods were also utilized. A weekly toxicology topic was assigned for 23 weeks and a group of 10 questions and answers on average were emailed to all candidates and mentors. One file included questions only and a second file included the appropriate answers with rationale. All answers were referenced to its appropriate toxicology reference. These questions served as a forum for ongoing discussion and education between the candidate and mentor. Two weeks prior to the examination, the candidates were given roundtable discussions and lectures on various toxicology topics from a team of current CSPI’s to boost their self-confidence and knowledge. Evaluation: Evaluation of the effectiveness of the educational initiative was performed and was overwhelmingly positive. Conclusion: CSPI educational initiatives significantly improved pass rates of Specialists in Poison Information. Over a four year period, pass rates increased profoundly from 0% to 75% for first time test takers following the initiation of the CSPI Education. Regional poison centers can improve the pass rate of the CSPI examination by initiating a CSPI Education program.
charcoal and monitored for 2 hours. Her BP and HR were: BP of 123-144/81-110 mmHg and a HR of 64-81 bpm. She was discharged with a BP of 123/81 mmHg. That afternoon, she was seen several near-syncope episodes, 30 hours after her initial ingestion, her BP taken at home was 97/57 mmHg and she was readmitted to the ED. She had symptomatic orthostatic hypotension with a lying BP of 104-150 mmHg, HR 66 bpm; and standing BP of 67/30 mmHg, HR 89 bpm. Her physical exam was otherwise normal. Her laboratory evaluation was normal. Her urine drug screen was negative. Her ECG showed rate 67 bpm, with a prolonged QTc interval of 593 milliseconds (ms). She was admitted and continued to have symptomatic orthostatic hypotension that day. She received IV normal saline and never administered pressors. The following morning, she was asymptomatic and her vital signs normalized. A repeat ECG showed a QTc interval of 511 ms.

Discussion: Guanfacine is an imidazole compound similar to clonidine, but with more selectivity for the α2-adrenoceptor, a longer duration of action, and a lower sedation and hypotension in therapeutic use. Although there is an abundance of literature detailing clonidine overdoes, little exists regarding guanfacine. Conclusion: Guanfacine’s favorable pharmacokinetics compared to clonidine, with a longer plasma half-life and greater volume of distribution, makes it a preferable therapy for children and adolescents. These same pharmacokinetic characteristics underscore the need for a longer period of monitoring in a patient presenting with an overdose, as demonstrated in this case.

133. Effective Community Contact
Barta L. Arndt, Poison & Drug Information Center, Tucson, AZ, USA.

Background: The division of the poison center service area in this state creates a significant travel challenge. Our primary means of communication with our safety organization partners is via the telephone. In order to effectively contact regional community agencies for prevention efforts, educators need to understand the best communication strategies. Four counties located within 200 miles from the poison center were selected. Three types of community agencies were visited in two counties (VC). The same agencies were telephoned (TC) for a total of 12 contact agencies. The TC was the control group. Initially, all counties were given educational materials. They received follow-up calls every two months for six months to assess the need for replacement materials. Chi square test was used to compare our control group (TC) and experimental group (VC).

Methods: A total of 23,450 pieces of prevention materials were distributed to all 12 sites. Including seizures, metabolic acidosis, and in severe cases, respiratory depression and coma. We present a case of isoniazid-induced status epilepticus in a pediatric patient following inadequate pyridoxine therapy. Case report: A 10-month-old male presented to the emergency room once the coagulopathy was improving and stable. At discharge the patient received 78 vials of FabAV and 10 vials of the antivenom equine. Conclusion: Crotalidae envenomation can cause recurrent coagulopathy that can last longer than two weeks. Monitoring for coagulopathy should be considered for greater than 2 weeks post envenomation.

134. Crotalidae Envenomation Causing Recurrent Coagulopathy and Requiring Treatment for More Than Two Weeks
Peronni AS, Florida Poison Information Center-Jacksonville/USVA, Jacksonville, FL, USA.

Introduction: Victims of crotalidae envenomation treated with FabAV (polyvalent antivenin Fab fragments) may still be subject to recurrent coagulopathy. We report a case of recurrent coagulopathy and thrombocytopenia despite recurrent treatment with FabAV and treatment with expired Crotalinae polyvalent antivenin (equine neutralizing antivenin). Case report: A 17-year-old male presented to an outside hospital within 45 min. after an eastern diamondback envenomation. He sustained two bites on the left calf. Upon presentation the patient was tachycardic, diaphoretic and had a diffuse rash all over his body. Swelling was noted on his left lower extremity on the anterior calf and within 2 hours swelling progressed up the leg and down to his foot. The patient was treated with FabAV protocol and transferred to our ICU for continuation of treatment.

After 7 days of repeated FabAV treatments the patient had recurrent coagulopathy including thrombocytopenia (a 7% drop) and an antibody (anti-equine) was identified in the literature. In the literature, the ability of FabAV to potentiate serotonin levels and lead to SS has been reported after use of multiple serotonergic drugs. We report the first case of SS after FabAV. Conclusion: A 15 year-old boy was found at home hallucinating, he then developed tonic-clonic activity and EMS was called. Upon arrival in the ED, he was confused and restless. Vital signs were HR 170 bpm, RR 24 rpm, BP 170/130 mmHg, Temp 98.7 F. On exam, he had dilated pupils and dry oral mucosa, normal tone and reflexes in his arms, but rigidity and “4” reflexes in his legs with sustained clonus at his ankles. He received 8 mg of IV lorazepam and an IV fluid bolus. His initial labs revealed: unremarkable electrolytes, BUN, and creatinine; total CK 991 U/L; BUN 19000mg/dL; undetectable for uric acid and lactate dehydrogenase. The EKG demonstrated a heart rate of 170 bpm, QRS 100 ms, and QTc 434 ms. Unenhanced CT of the head was normal. He was admitted and treated with IV fluids and additional lorazepam for his agitation. A urine drug screen (via GC/MS) was positive only for naproxen and bupropion. Serum bupropion and hydroxybupropion levels drawn 17 hours after his reported ingestion were 280 ng/mL (therapeutic range 50-100) and 3100 ng/mL (therapeutic range <485), respectively. Within 24 hours of his admission, the patient was awake with normal vital signs and neurologic exam. He later admitted to taking 10 tablets of the sustained-release bupropion. Case: A 15 year-old...

135. Isoniazid-Induced Status Epilepticus in a Pediatric Patient Following Inadequate Pyridoxine Therapy
Minns AB, Clark RF.
UCSD, San Diego, CA, USA.

Background: Isoniazid (INH) is an effective treatment for tuberculosis and among the most common causes of drug-induced seizures in the United States. INH intoxication produces a characteristic clinical syndrome including seizures, metabolic acidosis, and in severe cases, respiratory depression and coma. We present a case of isoniazid-induced status epilepticus in a pediatric patient following inadequate pyridoxine therapy. Case report: A 10-month-old male presented to the emergency room once the coagulopathy was improving and stable. At discharge the patient received 78 vials of FabAV and 10 vials of the antivenom equine. Conclusion: Crotalidae envenomation can cause recurrent coagulopathy that can last longer than two weeks. Monitoring for coagulopathy should be considered for greater than 2 weeks post envenomation.

In some cases repeated boluses of FabAV should be considered.

136. Isolated Bupropion Toxicity Causing Serotonin Syndrome
1University of Pittsburgh Medical Center, Pittsburgh, PA, USA; 2Children’s Hospital of Pittsburgh, Pittsburgh, PA, USA.

Introduction: Bupropion is an antidepressant with the potential for toxic effects in overdose that commonly include seizures, tachycardia and agitation. Although there are no documented cases of serotonin syndrome (SS) for bupropion intoxication, based on the literature, the ability of bupropion to potentiate serotonin levels and lead to SS has been reported after use of multiple serotonergic drugs. We report the first case of SS after bupropion.

Case report: A 15 year-old boy was found at home hallucinating, he then developed tonic-clonic activity and EMS was called. Upon arrival in the ED, he was confused and restless. Vital signs were HR 170 bpm, RR 24 rpm, BP 170/130 mmHg, Temp 98.7 F. On exam, he had dilated pupils and dry oral mucosa, normal tone and reflexes in his arms, but rigidity and “4” reflexes in his legs with sustained clonus at his ankles. He received 8 mg of IV lorazepam and an IV fluid bolus. His initial labs revealed: unremarkable electrolytes, BUN, and creatinine; total CK 991 U/L; BUN 19000mg/dL; undetectable for uric acid and lactate dehydrogenase. The EKG demonstrated a heart rate of 170 bpm, QRS 100 ms, and QTc 434 ms. Unenhanced CT of the head was normal. He was admitted and treated with IV fluids and additional lorazepam for his agitation. A urine drug screen (via GC/MS) was positive only for naproxen and bupropion. Serum bupropion and hydroxybupropion levels drawn 17 hours after his reported ingestion were 280 ng/mL (therapeutic range 50-100) and 3100 ng/mL (therapeutic range <485), respectively. Within 24 hours of his admission, the patient was awake with normal vital signs and neurologic exam. He later admitted to taking 10 tablets of the sustained-release bupropion. Case: A 15 year-old...

137. Lipid Emulsion as an Antidote at the Washington Poison Center; Use in Carmabenzamide, Fluoxetine, Hydroxchloroquine, Bupivacaine, and Bupropion
Hurley WT, Hanlon P.
Washington Poison Center, Seattle, WA, USA.

Background: Accumulating evidence demonstrates the efficacy of lipid emulsion as a successful antidote for cardiac arrhythmias, sympathomimetic agents, tricyclic antidepressants and anxiolytics. Animal studies show efficacy in local anesthetic toxicity. Animal studies show efficacy in cyclic antidepressant and calcium channel blocker toxicity. Lipid emulsion may act by providing a “lipid sink” for lipophilic agents in the blood or by providing energy substrate for the myocardium. The Washington Poison Center adopted a broad application stance for lipid emulsion as an antidote in 2007 and is accumulating cases of successful
1NYC Poison Control Center, NY, USA; 2St. John’s

Conclusion:
Blood lead readings returned to acceptable
limits during therapy. The worker selecting chelation com-
pared with A *P < 0.05; ** P < 0.01; Compared with B # P < 0.05; ## P < 0.01

Table 1. Effect of Puerarin on MDA, SOD and GPX in plasma and liver tissue

<table>
<thead>
<tr>
<th>Group</th>
<th>MDA (nmol/ml)</th>
<th>MDA (nmol/mgprot)</th>
<th>SOD (U/ml)</th>
<th>SOD (U/mgprot)</th>
<th>GPX (U/ml)</th>
<th>GPX (U/mgprot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A(control)</td>
<td>1.12 ± 0.29</td>
<td>1.95 ± 1.06</td>
<td>11.5 ± 1.5</td>
<td>11.5 ± 1.05</td>
<td>2.32 ± 0.5</td>
<td>2.32 ± 0.5</td>
</tr>
<tr>
<td>B(alcohol)</td>
<td>1.10 ± 0.29</td>
<td>1.95 ± 1.06</td>
<td>11.5 ± 1.5</td>
<td>11.5 ± 1.05</td>
<td>2.32 ± 0.5</td>
<td>2.32 ± 0.5</td>
</tr>
<tr>
<td>C(puerarin)</td>
<td>1.10 ± 0.29</td>
<td>1.95 ± 1.06</td>
<td>11.5 ± 1.5</td>
<td>11.5 ± 1.05</td>
<td>2.32 ± 0.5</td>
<td>2.32 ± 0.5</td>
</tr>
</tbody>
</table>

Compared with A *P < 0.05; ** P < 0.01; Compared with B # P < 0.05; ## P < 0.01

and unsuccessful use as an antidote. We describe our
recent experience using lipid emulsion as an
antidote. Case descriptions: Patients receiving lipid
emulsion as an antidote were toxic from buvapivance, buvapion, carbamazepine, flecanide, and hydroxychlo-
roquine. One patient was in full cardiac arrest and asysto-
tic from buvapivance. All others were unstable with
seizures and hypotension. In all cases, clinical improve-
ment occurred within a few minutes of lipid emulsion
administration. One patient had rapid resolution of sei-
zures and hypotension from flecanide, but received lipid
emulsion late in the course of toxicity and failed to
recover. Carbamazepine, flecanide, and hydroxycho-
lroquine have not been previously described to respond
to lipid emulsion therapy. Clinical implications: The
Washington Poison Center provides a one-page facsim-
ile guideline for lipid emulsion use when recommended
to providers. It follows the recommendations of Dr. Guy
Weinberg on the website www.lipidrescue.org. Recent
recommendations are that lipid emulsion should be used
in any cardiotoxic drug poisoning producing life-threaten-
ing toxicity.

138. Succimer Chelation vs. Removal from Lead Exposure in Three Symptomatic Phone Cable Recycling Workers: A Case Series
Anderson PJ, Baker B.

Health Partners Occupational and Environmental Medicine Residency, St. Paul, MN, USA.

Introduction: Despite the high profile of lead as an
environmental and occupational toxin, lead poisoning
remains an ongoing occupational health concern in adul-
ts. There remains much debate as to when clinicians
should chelate adults with elevated blood lead
levels. Method: In this case series, three workers
developed lead poisoning at a small-scale phone cable
recycling operation. Results: Presenting symptoms included headaches, abdominal pain, anorexia, and
weight loss. All three had elevated blood lead levels
(lead 72 mg/dL, 69 mg/dL, and 82 mg/dL). While the three
workers were removed from lead exposure and offered
chelation therapy, two of these individuals refused chel-
aton therapy. The worker selecting chelation com-
pleted two courses of oral succimer (DMSA). At six
months from exposure, all three workers were asympto-
tic and their blood lead levels were similar (32 mg/dL, 25 pg/dL, and 17 mg/dL). Discussion and
Conclusion: Blood lead readings returned to acceptable
levels by six months in both chelated and non-chelated
workers. In this small case series, removal from lead
exposure alone appeared as effective as removal from exposure coupled with succimer chelation.

139. Acute Bromide Toxicity from an over the Phone Cable Recycling Workers: A Case Series
Anderson PJ, Baker B.

Health Partners Occupational and Environmental Medicine Residency, St. Paul, MN, USA.

Introduction: Despite the high profile of lead as an
environmental and occupational toxin, lead poisoning
remains an ongoing occupational health concern in adul-
ts. There remains much debate as to when clinicians
should chelate adults with elevated blood lead
levels. Method: In this case series, three workers
developed lead poisoning at a small-scale phone cable
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weight loss. All three had elevated blood lead levels
(lead 72 mg/dL, 69 mg/dL, and 82 mg/dL). While the three
workers were removed from lead exposure and offered
chelation therapy, two of these individuals refused chel-
aton therapy. The worker selecting chelation com-
pleted two courses of oral succimer (DMSA). At six
months from exposure, all three workers were asympto-
tic and their blood lead levels were similar (32 mg/dL, 25 pg/dL, and 17 mg/dL). Discussion and
Conclusion: Blood lead readings returned to acceptable
levels by six months in both chelated and non-chelated
workers. In this small case series, removal from lead
exposure alone appeared as effective as removal from exposure coupled with succimer chelation.

140. Protective Effect of Puerarin on Acute Alcoholic Liver Injury
Zhao M, Du Y, Yuan L.

Shengjing Hospital Of China Medical University, Shenyang, Liaoning, China.

Objective: By observing the effect of Puerarin on Mal-
oonyldialdehyde (MDA), Superoxide dismutase(SOD),
Glutathion peroxidase (GPX), and hepatic pathological
changes in rats with alcohol intoxication, provide experi-
mental and theoretical basis for the clinical application
of Puerarin in acute alcoholic poisoning. Material and
Method: 30 healthy adult Wistar rats were randomized
to 3 groups with 10 rats in each. The A group: saline
given to the boys starting at approximately 72 hours
from Germany with emergency FDA approval and was
administered. The C group: the structure of lobules and hepatic cords remained clear. A few lipids were observed in
cells, with swelling of the minority of the mitochondrial
matrix and slightly diminished reflexes. She responded minimally to IV placement and did not cry during examination. Laboratory results: WBC, 10.500 cells/mm³, Na, 140 mEq/L; K, 5.8 mEq/L; CI, 105 mEq/L; HCO3, 26 mEq/L; BUN, 2.5 mmol/L (7 mg/dL); Cr, 0.3 mg/dL; Glu, 64 mg/dL; anion gap, 9 mEq/L. CSF analysis and urinalysis was normal. The patient was admitted to the PICU and treated with empiric antibiotics. For presumed bromide toxicity IV normal saline hydration with chloride containing fluids were given. The infant showed gradual improvement, becoming more responsive and gaining normal mus-
cle tone by day three, she had regained her normal mental status. A serum bromide concentration from hospital day three was 0.63 mg/dL (5.0 mEq/L). The infant’s parents were reported to confirm the bromide content of the elixir. Case discussion: This case illustrates acute bromide toxicity in an infant, established by an elevated serum bromide concentra-
tion, and potassium bromide in the product administered. Conclusion: It appears this is the first reported case of bromide toxicity from Cordial de Mon-
el. Bromide toxicity should continue to exist in the dif-
ferential diagnosis of the sedative-hypnotic toxidrome.
Cases of bromide toxicity should be reported to the
FDA and local health authorities.

141. Acute Pancreatitis in Amanita Phalloides Poisoning
Jiranantakan T, Olson KR, Magge H, Blanc PD.

University of California, San Francisco, San Francisco, CA, USA.

Background: Amanita phalloides ingestion is a well-
known cause of hepatotoxicity. Acute pancreatitis has been reported in a few patients with severe liver injury and multi-organ failure but not in patients with only mild to moderate transaminis. Case reports: A 72 year old woman picked several mushrooms in an area of
native oaks. She made a soup and ate one bowl, one
grandson (42 kg) ate a full bowl and one grandson (40 kg) ate a half bowl. Both grandsons developed abdomi-
nal pain, vomiting and diarrhea 12 hours later. They
were brought to a local hospital, where they were
receiving IV fluids and antiemetics. Initial hepatic transaminase were normal. The grandmother had onset of symptoms at about 16 hrs after ingestion. The mush-
rooms were confirmed by mycologist as Amanita phal-
loides. All three patients were admitted to a tertiary care
center and were given multiple-dose activated chlo-
roides. All three patients were admitted to a tertiary care
center and were given multiple-dose activated chlo-
ioxime, and alleviated hepatic cellular damage, and reduced transaminase. The grandmother and her
grandsons recovered completely. The grandmother had onset of symptoms at about 16 hrs after ingestion. The mush-
rooms were confirmed by mycologist as Amanita phal-
loides. All three patients were admitted to a tertiary care
center and were given multiple-dose activated chlo-
ioxime, and alleviated hepatic cellular damage, and reduced transaminase.
Clinical Toxicology vol. 47 no. 7 2009

Abstracts

142. Delayed Hepatotoxicity from Iron Despite a Low Serum Level and Minimal Metabolic Acidosis

Majlesi N.1,2, Lee DC.1,2 Chan GM.1,2 McGuigan MA.2 Caraccio TR.3, Grellet HA.1,2 Su MK.1,2

1North Shore University Hospital, Manhasset, NY, USA; 2LRPDIC, Mineola, NY, USA.

We describe a case in which a patient intentionally ingested iron and developed hepatotoxicity despite a scarcity of abnormal laboratory values or hemodynamic compromise. An 18-year-old woman presented after stating she intentionally ingested 50 tablets of 325 mg ferrous sulfate (~54 mg/kg elemental iron) about 2 hours prior to arrival. The patient presented with vomiting and abdominal pain. Vital signs were age-appropriate. Abdominal radiography was negative for radiopaque foreign bodies. Initial acetaminophen and ethanol concentrations were undetectable. ABG showed a pH of 7.33, pCO2 of 34, and PaO2 of 116. Serum bicarbonate was 22 mEq/L, with an anion gap involving 3.3 hours and 4 hour serum iron levels were 485 and 472 mcg/dl, respectively. The patient received supportive care with improvement in gastrointestinal symptoms. Initial AST and ALT were 108 and normal. Eight hours later, the AST and ALT were 404 and 297 IU/L. Repeat serum iron level at this time was 424 mcg/dl. IV N-acetylcysteine (NAC) was initiated. Serum bicarbonate was 19 and chloride was 108 with an anion gap of 9. Serum lactate was 2.1 mmol/L and resolved within 12 hours to 1.1 mmol/L. 24 hours later, the AST and ALT were 1882 and 1725 IU/L, respectively, with an INR of 3.1. Serum bicarbonate remained 19 mEq/L with an anion gap of 4. The patient’s serum AST/ALT peaked at of 5068/5390 IU/L at 48 hours post ingestion. The patient was transferred to a liver transplantation unit and had a protracted course in the intensive care unit with a slow decline in her transaminases and coagulation parameters over a week. The patient never developed renal failure or encephalopathy. Hemodynamic parameters remained normal. IV NAC was continued until her serum transaminases were both less than 1000 IU/L. Cases of reported iron-associated hepatotoxicity typically involve patients with severe systemic illness and serum iron level greater than 1000 mcg/dl. It appears hepatotoxicity from iron can occur with seemingly trivial initial laboratory value abnormalities.

143. How Do Poisonings in Children < 6 Really Occur? Targeting Outreach Based on an Analysis of Exposure Scenarios

Schwartz L.1, Mercurio-Zappala M.1 Howland MA.1,2 Hoffman RS.1

1NYC Poison Center, NY, NY, USA; 2St. John’s University, Queens, NY, USA.

Introduction: PCC data is often used by poison educators to develop programs. Few published studies analyze PCC data to characterize situations leading to exposures in children in order to improve educational outreach. Methods: A review of PCC data to characterize situations leading to exposures in children under age 6 was conducted during a 6 week period. Data collected included: 1) Demographics; 2) Description of the scenario that led to the poison exposure; 3) The substance or product involved. A data abstraction form was completed for each patient case. Patient case scenarios and products were coded based on existing Toxicall categories. New categories of scenarios were created when appropriate. Results: A total of 295 cases were analyzed. The mean age of the child involved in the poisoning was 2.7 years old. More than half (59%) included boys. The majority of calls (77%) came from a parent, 12% from a medical doctor, and 4% from a grandparent. Almost all cases (97%) involved exposures in the home or school and 94% were inadvertent ingestions. One quarter (26%) of the reported cases resulted from the product “stored within sight of the child”; 12% were “product temporarily open because in use” and in 6% the child was “inadvertently given medicine twice.” New categories of scenarios created included “child climbing to access product” (6%), and “child given the product to play with” (3%). The most common products involved in the cases were non-prescription analgesics (17%); prescription medicines (14%); and non-prescription personal care (11%). Conclusions: This study provides useful information for developing new education messages for targeted outreach programs. Although many exposures reflect existing scenario choices, educators should also consider a number of additional exposure situations including the child retrieving the product and the child given the product to play with. The study also emphasizes the importance of ongoing medicine safety education for parents.

144. Paliperidone (Invega®) Overdose: Prolonged and Resistant EPS from an Atypical Antipsychotic in an Oral Osmotic (OROS) Delivery System

Elko CI.1, Willis MJ.1,2 Hurley WT.1 Washington Poison Center, Seattle, WA, USA.

Background: Paliperidone (Invega®) is the major active metabolite of risperidone. Both have similar receptor and pharmacologic activity, so would be expected to have similar adverse effect and overdose profiles. We report a paliperidone pediatric overdose with prolonged, treatment-resistant extra pyramidal symptoms (EPS). Case Report: A 5-year-old male accidentally ingested 27mg of paliperidone at an unknown time. He presented with slowness of speech and easiness to fall asleep. Blood pressure was 131/79 mmHg; heart rate was 93 beats per minute. The patient was extremely confused. In her pocket were multiple empty blister packs of Validol® (60mg tablets, 10 pills in each pack) all of which she later stated had ingested earlier that morning for “heart pain.” She had no significant past medical history and was on no other medications. Vital signs included: rectal temperature, 95.1°; blood pressure, 131/79 mmHg; heart rate was 3 beats per minute. Laboratory work-up included basic laboratory evaluation (only significant for WBC count of 22,100/mm3); urine drug screen; CT scan of the brain; blood, urine, and CSF cultures; and cardiac evaluation, all of which were normal. With supportive care alone, the patient’s mental status improved, and she was discharged home on hospital day number three. Conclusion: We report a case of methyl valerate ingestion which caused a mild asymptomatic episode from the delivery device likely contributed to the duration of effects. EPS from paliperidone overdose may be more severe and long lasting than risperidone. The oral osmotic (OROS®) delivery system likely contributed to the duration of toxicity.

145. Altered Mental Status Following Methyl Valerate Ingestion

Lank PM.1 Wahl M.2

1Northwestern University, Chicago, IL, USA; 2Northshore University Healthsystems, Evanston, IL, USA.

Background: Methyl valerate is the methyl ester of valeric acid, the key pharmaceutical component of valerian root (Valeriana officinalis). Valerian extracts have been shown in animal models to elicit a benzodiazepine-like reaction at GABA_A receptors. In Eastern Europe, methyl valerate is sold under the trade name Validol® and is marketed as a medication for, “heart disease, angina, motion sickness, nausea, vomiting, hysteria, nervousness, and headaches.” 2 On a PubMed search, there have been no previously reported cases of methyl valerate overdose and only one reported case of valeric acid withdrawal. Case Report: A forty-eight year-old Bulgarian-speaking female was brought to the emergency department after being found by local police wandering outside unsteadily and frequently falling in the snow. With the help of an interpreter, it was determined the patient was extremely confused. In her pockets were multiple empty blister packs of Validol® (60mg tablets, 10 pills in each pack) all of which she later stated she had ingested earlier that morning for, “heart pain.” She had no significant past medical history and was on no other medications. Vital signs included: rectal temperature, 95.1°; blood pressure, 131/79 mmHg; heart rate was 3 beats per minute. Laboratory work-up included basic laboratory evaluation (only significant for WBC count of 22,100/mm3); urine drug screen; CT scan of the brain; blood, urine, and CSF cultures; and cardiac evaluation, all of which were normal. With supportive care alone, the patient’s mental status improved, and she was discharged home on hospital day number three. Conclusion: We report a case of methyl valerate ingestion which caused a mild asymptomatic episode from the delivery device likely contributed to the duration of effects. EPS from paliperidone overdose may be more severe and long lasting than risperidone. The oral osmotic (OROS®) delivery system likely contributed to the duration of toxicity.

146. Public Websites Often Lack Key Information about Appropriate Storage and Dosing of Over-the-Counter Medicines for Children


Introduction: Recently, FDA provided advice on the appropriate storage and safe use of over-the-counter (OTC) pediatric medicines. It is unclear whether this information is available on websites that are commonly visited by caregivers and healthcare professionals (HCPS). Objective: To determine if key information about proper storage and dosing of OTC medicines for children is present on commonly visited public websites. Methods: 19 websites were searched (web sites: babycenter, drugs, emedicine, mayo clinic, medcinet, medscape, parenting, parents, pdr health, thebaby corner, your total health, ivillage, webmd, pharmacist, etc sites: aap, ama, assn, ismp, kisdhealth; clinicaltoxicology.org sites: babycenter, drugs, e medicine, mayoclinic, medcinet, medscape, parenting, parents, pdr health, thebaby corner, your totalhealth, ivillage, webmd, pharmacist, etc sites: aap, ama, assn, ismp, kisdhealth;
148. Perioperative Use of Lidocaine: A New Form of Foreplay?
Hon SL,1 Chang AS,2 Lopez GP,1 Georgia Poison Center, Atlanta, GA, USA; 2 Emory Univ, Atlanta, GA, USA.

Background: Lidocaine is commonly used as a local anesthetic administered subcutaneously at a recommended dose not exceeding 4 mg/kg. We present an unusual case of lidocaine induced convulsions and cardiac arrest following perifacial infiltration of lidocaine totaling 81 mg/kg with survival. Case report: A 34 year old, 86 kg female, presented to an ED with multiple seizures. Her past medical history was unremarkable. She and her husband were planning to engage in sado-masochistic sexual activity: To make the inflictions less painful, she voluntarily allowed perifacial injections of lidocaine that was purchased over the internet. Seven of the 25 grams bought were diluted in 20 ml of saline solution in a non-sterile environment. Forty minutes prior to arrival, the husband injected her with 20 times, delivering approximately 81 mg/kg of lidocaine subcutaneously. Within 10 minutes, the woman became incoherent and EMS was called to the home. The patient was witnessed to be unresponsive unresponsive about 6 hours after the inappropriate administration of lidocaine. The patient was confirmed as correct by the physician’s office. The mother dispensed the ranitidine as prescribed, and noticed by day three of treatment the dose, but it was confirmed as correct by the physician. The patient was discharged home following a sternal hospitalization. While on the regimen she continued to have seizures. Over the ensuing two hours, the patient received intravenous lorazepam, phenobarbital, diazepam, and a continuous midazolam infusion. After a total of 18 hours of hospitalization, the patient was discharged home on diazepam. Eighteen hours post exposure, a serum lidocaine level was 23.9 mg/mL. She remained intubated for the next three days with cardiovascular and neurologic improvement noted. She was discharged home on day 4 with prior consent and admission was normal. No further seizures were noted, and the patient was subsequently discharged on day 6.

Discussion: The detected serum level in our case was consistent with levels reported previously associated with cardiac arrest. As more and more medications become available for purchase over the internet, bypassing current prescription restrictions will become more common. Availability of medical information on the internet will also increase the phenomenon of “self-diagnosis” and “self-prescription” by the public, as was seen in our case.

149. Methanol Poisoning Treated with Fomepizole McKeown NJ, West PL, French LK, Horowitz BZ, Hendrickson RT, Oregon Poison Center, Portland, OR, USA.

Introduction: Methanol has the potential to cause significant toxicity through its conversion to formic acid, resulting in acidosis and ocular toxicity. Fomepizole (4MP) blocks the conversion preventing toxicity. Hemodialysis (HD) (recommended at concentrations of >50 mg/dL) treated with 4MP without morbidity.

Case report: A 20-year-old female presented to our hospital with hypotension, tachycardia and declining GCS. She was found unconscious with a serum methanol of 544 mg/dL (269 mmol/L) by the EMS. The patient had no significant medical history and was referred for dialysis. The patient was stable and no HD was performed. Methanol levels were <10 mg/dL after 6 hours. The patient was discharged home without sequelae.

Discussion: Methanol poisoning is generally considered very safe drugs. The only previous report of Methanol poisoning was published in 1976 and 2001. Exposures are generally a pain control medication. In most cases, Methanol poisoning is treated with HD. Cases with methanol levels of over 50 mg/dL were identified. The average age was 35 years, with half male. Time to presentation when known (3/4 cases) ranged from 1 – 2.5 hours (average 1.8 hours). EG levels ranged from 58 – 132 mg/dL with a mean of 90 (SD ± 31). Initial pH was recorded in 2 cases and averaged 7.41. The average serum bicarbonate at pH when methanol was not obtained was 27 mg/dL. One case had 50% mortality, one with a creatinine 9.6 mg/dL, beta-blocker and alcohol. The average number of doses of 4MP administered was 6.75. The average half-life on 4MP ranged from 30 – 42 hours. One case was given ethanol to block conversion before 4MP was available. No cases of ocular toxicity were recorded.

Discussion: Because of the limited availability of HD, we sought to evaluate the effectiveness of 4MP for treating methanol toxicity due to ingestion. In these four cases, despite having a concentration over 50 mg/dL, HD was not performed due to lack of HD at the treating hospital or no HD despite our recommendation. The time to HD was 30 – 120 minutes. The low reported values. No patients developed a worsening acidi- disor or displayed any other manifestations of hypoxia. In this limited retrospective case series, 4MP without HD in patients with metho- loid is safe and effective. Prospective studies are needed to further evaluate the indication for dialysis in methanol ingestions in the era of 4MP availability.

150. A Case Study of Lionfish Sting Induced Paralysis Badillo RB,1 Banner W,2 Morris, Jr,3 Schaeffer SE,1 1University of Oklahoma College of Pharmacy, Oklahoma City, OK, USA; 2Center for Coastal Fisheries and Habitat Research, National Ocean Service, National Center for Coastal Fisheries, National Oceanic and Atmospheric Administration Piers Island Rd, Beaufort, NC, USA.

Background: The lionfish (Pterois volitans) has gained popularity with exotic home aquaria owners. The pri- mary symptom following a sting is pain at the site with occasional radiation of pain up the affected extremity. Systemic effects are rare and can include headache, abdominal pain, hypotension, seizures, and syncope. We report a case of lionfish envenomation leading to paralysis of all extremities. Case report: A healthy 24 yo male presented to the ED following a lionfish sting to the right middle digit two hours earlier. He reportedly had grabbed the lionfish, possibly resulting in a larger than normal envenomation. Significant initial findings included hypertension, tachycardia, and numb- ness in both hands. The rest of his neurologic exam was normal; within an hour the patient lost movement in all extremities and became diaphoretic. Abilities to swal- low and speak were not affected. His Glasgow score was 9. Hot water immersion of the hand was initiated prior to arrival and continued throughout his hospital stay. Paralysis progressed to all extremities and he was admitted to the ICU. No dysphagia developed and he retained good range of motion to head and neck. All lab work was unremarkable. By 8 hours post sting, the patient had resolution of all paralysis and blood pressure and heart rate returned to normal. UDS was negative for any drugs of abuse. Discussion: 108 cases of lionfish envenomation were reported in the literature between 1976 and 2001. Exposures are generally a pain control issue with the most common symptom being pain. Other possible symptoms include swelling, local numb- ness, erythema, anxiety, dizziness, nausea/vomiting, and difficulty breathing. One case of generalized weak- ness has been reported but no details are offered. Treat- ment is generally conservative and supportive with hot water immersion and digital blocks to help alleviate pain. Systemic symptoms, as reported in this case, warrant careful observation. Conclusion: This case demon- strates the potential for a lionfish sting to cause large scale morbidity. We hope the results of this case will invite the Atlantic and Caribbean and gain popularity as an aquatic pet, poison centers need to be aware that significant systemic effects may be encountered.

151. Effect of Therapeutic Acatinemin Dosing on Urine Excretion of 5-Oxoproline Cassidy TE,1 Kalil M1, Hodgman MJ.2 1Bassett Health Care, Cooperstown, NY, USA; 2Upstate New York Poison Center, Syracuse, NY, USA.

Background: 5-Oxoproline (5-O) is an uncommon cause of metabolic acidosis. Most commonly, it pre- sented in infancy and is associated with congenital deficiency of glutathione synthetase. Over the past sev- eral decades reports of severe metabolic acidosis attrib- uted to 5-O have been reported in adults without a recognized congenital enzyme deficiency. In most of
these cases the individual was otherwise acutely ill, and often acetaminophen (APAP) was being consumed, usually therapeutically. As a common analgesic and antipyretic agent, it is potentially coincident in the ingestion of other toxicants. The role of acetaminophen in the pathogenesis of this disturbance is worthy of further investigation. The purpose of this study was to look at the urine excretion of 5-OP in healthy adults using a maximum therapeutic dose of APAP. Methods: Healthy adults of normal body mass index and no history of liver disease were dosed with APAP 1 gram four times daily over 5 days. A first morning void urine for 5-OP was collected on day 1 and on again day 6 after completion of the dosing schedule. 5-OP was measured by gas chromatography/ mass spectrometry by the Institute of Medicinal Disease at Baylor Research Institute. Based on a power calculation of OXZ in pediatric patients.

153. Recreational Use of 4-Methylthecainethone (4-MMC) Presenting with Symptomatogenic Toxicity and Confirmed by Toxicological Screening

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Introduction: Leaves of the Khat plant (Catha Edulis) are widely chewed by the Somali community for their stimulant properties. This is due to release of cathinone and/or synthesis of cathine and the related alkaloid methcathinone are controlled under the UK Misuse of Drugs Act, 1971. However, other cathinone derivatives such as 4-methylmethcathinone (4-MMC, mepherdone) are not currently controlled. 4-MMC is promoted as “safe and legal” alternative to classified recreational drugs. We report the first case of toxicity related to 4-MMC in a 10-yr-old boy. Methods: Screening and confirmatory strategies were utilized and a high sensitive analytical method to evaluate the excretion of 5-OP in urine.

154. "Taking Another Look" at Pediatric Ocular Exposures

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Introduction: Ocular chemical exposures are common and pose the challenge of appropriate poison control center (PCC) triage, especially for young, pre-verbal children. Recent experience at our PCC suggests occult or very subtle symptoms may mislead such triage efforts. Case series: We report 4 children with ocular injury after topical exposures evaluated over a 4-year period. In each case the child manifested no, or very mild, early symptoms. Case 1: A 2-year-old boy who rubbed a nail polish on his eye. A few days later he was seen with a red eye and complained that it was "stinging". He seemed essentially asymptomatic after 30 minutes of irrigation, sleeping without any discomfort, but presenting with mild redness of the eye. Case 2: A 2 year-old boy was asymptomatic after an eye exposure to a methyl salicylate /menthol muscle rub. Following irriga- tion, ED assessment found a corneal abrasion. Case 3: A 17 month-old girl was asymptomatic after eye expo- sure to clear nail polish. Despite eye irritation at home and ED, a mild corneal abrasion was found. Case 4: A 3 year-old boy got a citrus oil-based product in his eye. His eye was irritated and he was apparently well one hour later. Significant corneal abrasion was detected follow- ing an eye exam at the ED. Our results do not show any increase in the excretion of 5-OP in 5-OP with routine dosing of acetaminophen. In distinction to reported cases our subjects were healthy and not suffering from any acute or chronic disease or any other medications used. The etiology of this acidosis in adults remains unclear. Malnourishment, inflammatory mediators associated with acute illness and perhaps as yet unidentified changes may be involved. Any contribu- tion from APAP in these cases remains speculative. Conclusion: Routine dosing of acetami- nophen in healthy adults is not associated with any increase in the excretion of 5-OP in urine.

155. Verapamil Inhibits the Glucose Transporter GLUT1

Louters LL,1 Stehouwer N,1 Rekman J,3,5 Lee T,3 Holt DW,3 Dargan PI.1,2

Background: The etiology of this acidosis in adults remains unclear. Malnourishment, inflammatory mediators associated with acute illness and perhaps as yet unidentified changes may be involved. Any contribution from APAP in these cases remains speculative. Our results do not show any increase in the excretion of 5-OP in urine of 5-OP. Nol creatinine 15 subjects were recruited. Results: All subjects completed the study without complication. The mean differ- ence between the pre- and post- study urine 5-OP was about 1 mmol 5-OP/mol creatinine. This difference was not significant using the Wilcoxon Signed Rank test.

Discussion: Our results do not show any increase in the urine excretion of 5-OP with routine dosing of acetaminophen. In distinction to reported cases our subjects were healthy and not suffering from any acute or chronic disease or any other medications used. The etiology of this acidosis in adults remains unclear. Malnourishment, inflammatory mediators associated with acute illness and perhaps as yet unidentified changes may be involved. Any contribution from APAP in these cases remains speculative. Conclusion: Routine dosing of aceta- minophen in healthy adults is not associated with any increase in the excretion of 5-OP in urine.
after vaccination from 216 healthy children. The infants with gestational ages of >32 weeks were recruited from 3 age cohorts (newborns, 2-month-olds, and 6-month-olds), which differed in body weight and cardiac demands. mercury was measured in the same samples. All children received adequate vaccines as routinely administered in Argentina. Mercury levels were determined by cold-vapor atomic absorption and the samples that were positive for mercury were differentiated into total and inorganic mercury. All samples were assayed in a blinded manner. Results are reported in nanograms of mercury per gram of stool dry weight (LoQ = 1 ng/g). Each child in this study had samples taken at a maximum of 2 time points, once before vaccination, and once at a randomly assigned time point after vaccination. We estimated the pharmacokinetics of mercury using a model that averages all of the samples obtained from the population rather than evaluating multiple samples from the same individual, to avoid multiple blood draws in these infants. We also measured mercury levels in the administered vaccines and found that the stated amounts from the manufacturers were accurate and that mercury in the vaccine was exclusively ethyl mercury. Mercury was detected in virtually all stool samples tested and increased significantly after vaccination in all 3 groups. All of the mercury in stool samples was inorganic mercury. There was an increase in stool mercury levels shortly after vaccination, which slowly fell afterward. This pattern would be consistent with an enterohepatic excretion pathway similar to that described for methyl mercury.

157. I <3 Death N Wnt 2 Die: Implications of Text Messaging in Twenty-First Century Suicides
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Abstract: As technology has advanced, new methods of communication have become available. Specifically, text messaging (also known as instant messaging, IM, or SMS messaging) is an instant form of sending short text messages by portable devices such as cell phones. Suicide attempts are often frustrating, as the specific intent of the attempt is unknown. In these cases, text messaging may provide answers. We report a series of cases in which electronic communication devices played a central role in identifying suicide attempts based on the new avenue by which to obtain timely & pertinent clinical information in the case of undifferentiated or unknown toxic ingestions. Cases: Case 1: A young female with a history of depression was found unresponsive in her room while her mother was out running errands. After she took the pills, she sent a text message to her friend, admitting to the overdose. The patient denied the ingestion until her friend’s text message was shown to her. The patient, ultimately successfully treated for salicylate intoxication with alkalization and hemodialysis, had a salicylate level of 100mg/dL. She incorrectly thought she had taken a bolus of 10mg and the patient described a reduction in the spasm. Procyclidine was given as a single intravenous bolus of 10mg and the patient described a reduction in the pain in his hands within 15 minutes of treatment, although a second bolus of 2.5mg was given completely. Serum mirtazapine and nor-mirtazapine concentrations 15 hours post-presentation were 115ug/L (normal 0-100) and 97ug/L respectively. His creatine phosphate was 17.2 on admission and returned to normal on next day. References: 1. Waring WS, Good AM and Bate- man DN. Lack of significant toxicity after mirtazapine overdose: A five-year review of cases admitted to a regional toxicology unit. Clin Tox 2007;45:45-50.

158. School Nurses and the Poison Center – A Great Marketing Mix
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Background: Based on previously published marketing research about low-income minorities and perceptions of the poison center (PC), patients trust and pay attention to the messages that come home from school via children. To distribute materials through schools, the PC partnered with school nurses (SN) - identified as pre-existing champions of the PC. We used a formative evaluation (FE) to design a point of service delivery (POS) with bilingual elements. POSD were mailed to all schools in the state followed by a summative evaluation (SE). Methods: The FE was sent via school nurse’s instant messaging (SN) to 56 respondents. The Keep Them Safe POSD 8.5 x 11 card stand-up design included a coordinated color scheme, images of the sun, poison prevention tips, and a brochure holder with bilingual flyers about first aid and AC information. One 2,100 POSDs were mailed. SE sent via SN listserv 146 recipients. Both FE and SE had Likert-type multiple choice, and open ended questions. Results: 86% of SNs were likely to use a PC POSD. Size was a barrier. Important content included: (41) poison prevention, (37) first aid, (19) PC attributes, and (15) specific poisons. 41% felt receiving the POSD was an important marketing tool while 36% did not. Spanish was the most requested language. For the SE, 60% received a POSD and placed it in an appropriate and visible location, usually in the SN area or the nurse office. Of those who received one, 97% were satisfied. SN estimate a total of 4, 616 views per day, although only 47% received one, 97% were satisfied. SN estimate a total of 4, 616 views per day, although only 47% received one, 97% were satisfied. SN estimate a total of 4, 616 views per day, although only 47% received one, 97% were satisfied. SN estimate a total of 4, 616 views per day, although only 47% received one, 97% were satisfied.

159. A Case of Mirtazapine Induced Dystonia
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Background: Previous reports indicate that mirtazapine overdose is generally associated with mild and predictable clinical effects, including sedation and tachycardia.1 We report the management of a case of acute upper limb dystonia associated with mirtazapine overdose in a 20 year old man. Case report: The patient had allegedly taken a mixed overdose of 225mg of mirtazapine and unknown quantities of paracetamol, alcohol and antidepressants. He was initially hyperactive and tachycardic. He was initially complaining of nausea which settled spontaneously and initial examination was unremarkable apart from alcohol intoxication. Plasma paracetamol was undetectable and coagulation, renal and liver function test results were within normal limits. Approximately 14 hours following presentation, the patient complained of a painful spasm of both his hands which began very suddenly. Tone was increased in all hand muscles. Neurological examination was otherwise unremarkable. His temperature was 37.7°C but physical examination did not reveal any other abnormalities. Plasma calcium concentration was 10.6mmol/L, which was normal for magnesium levels (2.34mmol/L). Arterial blood pH was 7.47, while the base excess was 3mmol/L and oxygen and carbon dioxide tensions were within normal limits. A slow intravenous bolus of calcium gluconate had no effect on the spasms. Procyclidine was given as a single intravenous bolus of 10mg and the patient described a reduction in the pain in his hands within 15 minutes of treatment, although a second bolus of 2.5mg was given completely. Serum mirtazapine and nor-mirtazapine concentrations 15 hours post-presentation were 115ug/L (normal 0-100) and 97ug/L respectively. His creatine phosphate was 17.2 on admission and returned to normal on next day. References: 1. Waring WS, Good AM and Bate- man DN. Lack of significant toxicity after mirtazapine overdose: A five-year review of cases admitted to a regional toxicology unit. Clin Tox 2007;45:45-50.
identify all cases where reference to HIPAA appeared in the notes. Each case was reviewed to determine which type of health care entity, department, and HCP cited HIPAA, whether the initial contact on the patient was made by a HCP at the facility or by the PC, and whether the PC was successful in obtaining PHI on these patients. Results: 170 cases were identified involving refusal of information or questioning of the PC’s right to obtain PHI. The majority of issues were raised by nurses (88%), with most (92%) in hospital settings; 39% of the cases, 37% non-critical care units, 23% ED, and 1% lab. Ironically, in two-thirds of the cases where HCPs questioned the PC’s authority under HIPAA, a provider from that entity had initiated contact with the PC for treatment recommendations. Four hospital inpatient settings accounted for over 90% of the cases. After attempts were made to clarify the PC’s role, all requested PHI was provided in 26% of the cases, limited information in 31%, and no information in 43%. The most effective means for obtaining full PHI were providing an oral or faxed explanation of the PC’s function as a HIPAA authorized public health provider, or after speaking with supervisory personnel. Discussion: Most HIPAA issues were raised by nurses in hospital inpatient settings. Despite explanation, the PC was unable to obtain all requested PHI in 74% of cases. This clearly limits the ability and accuracy of the PC and ability to provide timely recommendations and obtain adequate follow-up on outcomes. Conclusion: This study highlights the need for targeted development of more effective procedures to educate HCPs about poison centers and how to relate to HIPAA.

162. Preliminary Study on the Pharmacokinetics of Purified Rabbit Serum PON1 in Rats

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Objective: To investigate the pharmacokinetics of exogenous purified rabbit serum PON1 in rats, in order to provide evidences for further study as a catalytic scavenger. Materials and Methods: Purified rabbit serum PON1 was administered to rats via caudal vein in a dose of 1200U/kg, 2400U/kg and 4800U/kg. There were 66 rats in each dose group (half male and half female), then they were assigned to 11 subgroups randomly. Blood was collected at different time points after drug administration and blood was collected. The activity of PON1 in each rat at different time points after drug administration was compared with that before drug administration and the difference value was considered as the activity of exogenous purified rabbit serum PON1 in rat. The mean activity values at different time points of three groups were fitted using 3P97 pharmacokinetic software. Proper compartment model was chosen according to F test and AIC value for calculation of pharmacokinetic parameters. Results: The pharmacokinetics of purified rabbit serum PON1 in vivo fitted linear two compartment model within 1200U/kg-4800U/kg. T1/2α was 2.3–2.35h, T1/2β was 18.76–19.72h, Vc was 34.13–35.83ml/kg, CL = 2.18–2.35ml/kg/h. There was no significant difference (p > 0.05) in activity between male and female rats for all three doses. Conclusions: For all three doses, the elimination half life of exogenous purified rabbit serum PON1 was long, so the clearance process was slow enough compared to endogenous PON1. This may be due to the poisoning and reaction rates with PON1 in rats. PON1 was almost only distributed in blood all over the body and seldom distributed to other tissues or concentrated in a certain tissue. The essential pharmacokinetic behaviors were the same in male and female rats for all three doses.

163. Beta Blocker Toxicity Successfully Treated with Intravenous Fat Emulsion: A Case Series

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Background: Intravenous fat emulsion (IFE) has rapidly become the treatment of choice for local anesthetic toxicity. While the mechanism is not fully understood, a growing body of evidence supports a role in mitigating non-LA associated cardiovascular toxicity. Reports of IFE use in cases involving lipophilic and sodium-blocking agents exist and suggest a broader role for IFE. We report two cases of beta-blocker (BB) overdose successfully treated with IFE. Cases: Case 1: A 35y/o male intentionally overdosed on carvedilol (Congest CR) and developed hemodynamic instability. Despite receiving glucagon, hyperventilation/euglycemia, and maximal doses of dopamine and norepinephrine, he remained hypotensive (60’s/30’s mmHg). IFE was considered and given, and he rapidly improved to a HR of 93 and BP of 108/62. He survived to discharge without morbidity. Case 2: A 22y/o female ingested an unknown amount of propranolol in a suicide attempt. In the ICU, she became unstable and rapidly deteriorated into asystole. Standard ACLS was initiated with administration of glucagon, atropine, epi-nephrine, and several doses of sodium bicarbonate. As a last resort, IFE was administered and she fully recovered. Discussion: This case series adds to the growing body of evidence supporting an expanded role for IFE. IFE is a safe, effective treatment for BB overdose, refractory to standard management, and that biochemical evidence of pancreatitis preceding significant hepatotoxicity may be of prognostic value.

164. Lepiota Josserandi Induced Fulminant Hepatic Failure Presenting with Pancreatitis

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Background: We report a case of L. josserandi poisoning unique for the following occurrence: in the Midwest US, first reported case of liver transplantation in the US, and marked biochemical evidence of pancreatitis preceding significant hepatotoxicity. Case: A 43y/o female presented to an ED c/o malaise,nausea, and diarrhea. She reported ingesting 6oz of sautéed mushroom poisoning from picked mushrooms, which resulted in her being admitted to the hospital for gastrointestinal symptoms, including diarrhea. 36 hr post-ingestion neighbors called EMS due to 2 syncopal episodes. EMS reported malaise,nausea, BP 50/38, HR 144, RR 20, and transported her to the nearest hospital in the Midwest US. The patient was thought to have had mushroom poisoning and was transferred to a liver transplant center and the SHROOMS 911 service. ICU tx included vitamin K, acetylcysteine, fresh frozen plasma, and cryoprecipitate. Encephalopathy and worsening lab values developed on hosp day 6: INR 18.5, lactate 11.8 mmol/L, AST 4206 U/L, ALT 2920 U/L. Day 7 the patient underwent liver transplant. Liver path showed panacinar necrosis consistent with amatoxin poisoning. She was discharged home on day 12. Conclusion: Amatoxin containing mushrooms include Lepiota spp. Lepiota spp. were not associated with poisoning in N. America until the 1980’s. Although L. josserandi ingestion has been reported in the US, survival and liver transplantation outcomes are limited. Therefore, the report of panacinar necrosis in a patient with pancreatitis is unique. Conclusion: This case supports the concept that amatoxin containing mushrooms, specifically L. josserandi, may be pancreatoxic, and that biochemical evidence of pancreatitis preceding significant hepatotoxicity may be of prognostic value.

165. Ethylene Glycol Poisoning Treated with Fomepizole

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Introduction: Since the introduction of fomepizole (4MP), it has gradually replaced ethanol as the initial treatment of choice while awaiting confirmation of ethyl alcohol (LA) or ethylene glycol (EG) ingestion. However, EG is more commonly, but not exclusively, ingested as a poisoning agent. The traditional treatment of LA has been ethanol or 4MP. The median number of doses of 4MP given prior to fomepizole treatment is 24 cases with EG levels of over 50 mg/dL. We sought to evaluate the safety and efficacy of fomepizole in the treatment of ethylene glycol intoxication.

Methods: This was a retrospective case series of two Poison Centers (PC) from 2001 – 2008 of confirmed cases of EG with concentrations of > 50 mg/dL treated with 4MP without hemodialysis. Cases were screened for demographics, ingestions, EG concentrations, initial pH or serum bicarbonate, peak creatinine level, and number of doses. Results: 24 cases with EG levels of over 50 mg/dL were identified. The average age was 40.7 years, with half male. EG levels ranged from 52 – 429 mg/dL with a mean of 138 (SD ±97), median 89 mg/L. Initial pH was recorded in 14 cases and averaged 7.32. The average serum bicarbonate when pH was not obtained was 22. Six cases reported co-ingestion of alcohol alone, one with APAP and alcohol, and one case of dimenhydrinate alone. Four cases were treated with ethanol as initial treatment before 4MP was started (2 cases had ethanol as a co-ingestion), in one case isopropyl alcohol was given as the hospital did not have either ethanol or 4MP. The median number of doses of 4MP administered was four. Peak creatinine was 1.4 mg/L, although no value was recorded in 3 cases and was “normal” in two others. This was the largest series of cases in which 4MP was used without concomitant HD with no further progression of acidosis or development of renal failure. Previous single case reports and series have reported levels up to 706 mg/dL that have been treated successfully without HD. Conclusion: In this limited retrospective case series 4MP without HD in patients with acidosis
appears safe and effective. Prospective studies are needed to further evaluate the indication for dialysis in EG ingestions in the era of 4MP availability.

166. State Legal Statutes for Poison Center Liability

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Background: Poison Control Center (PCC) liability is poorly defined. Because very few cases are disclosed publicly, the true incidence of risk is unknown. We sought to examine state statutes to determine the number of States that have defined indemnification for PCC. Methods: A search of Westlaw was conducted to find state and common law decisions that define poison center indemnification and immunity via state statutes and common law decisions including: non-profit status, requirements for protocols or guidelines, adherence to guidelines. Results: A total of 5 states were found that have statutes delineating PCC liability: California(CA), Florida(FL), Louisiana(LA), Texas(TX), and Tennessee(TN). Elements attached to liability as defined by the State: No charges (CA), non-profit status (LA), guidelines (CA), acting in good faith (CA), (LA), (FL), gross negligence or wanton misconduct (CA), (LA), (FL), (TX) only defines that the State will indemnify the PCC. Several states (NC, MO, IL, CT, GA) have common law or statutory “public immunity” doctrines which could, hypothetically, cover state created PCCs, but such doctrines do not specifically include PCCs within their scope. Additionally, almost all states have sovereign immunity doctrines which may protect PCCs to the extent they are state created, funded and operated. This area of the law, however, remains undefined as no reported cases exist litigating the issue. Conclusion: Very few states have statutes that define PCC liability. Other centers attempting to initiate such legislation can use these models as a benchmark for their state.

167. Nurse Interpretation of the EKG QRS Width

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Background: PCCs interpret EKGs to determine cardiac status. This study sought to determine the accuracy of PCC nurses in determining QRS width. Methods: Emergency Department, Medical Intensive Care Unit, and Coronary Care Unit nurses were recruited and divided into three study groups. Participants reviewed a series of 12 EKGs. Five EKGs had a normal QRS and seven EKGs had a widened QRS. Participants were asked (1) if the QRS complex was wide (yes or no) and (2) to measure the QRS interval. Group 1 (n = 11) received written instructions on how to determine QRS width. Group 2 (n = 12) received no specific instructions. Group 3 (n = 13) received verbal instruction on QRS measurement. Proportions correct were determined for each group. The measured QRS width was considered correct if within 20 ms or 1.96 standard deviations of the gold standard (mean of three different physician measurements). Between group differences were analyzed by Student’s two-tailed t-test (p < 0.05). Results: Raw data appears in the table. The gestalt rate of determining if the QRS complex is wide (Y/N) was significantly greater than correctly measuring the QRS interval for all groups. Verbal and written instructions improved accuracy. Additional methods of collecting information beyond phone discussion may be required to improve reliability of poison center EKG data.

168. Incidence of Hypoglycemia in Sitagliptin Overdose

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Background: Sitagliptin (Januvia®) represents the first of a new class diabetic treatment, a DPP-4 inhibitor. This study examined the incidence of hypoglycemia in sitagliptin overdose. Methods: Case report and retrospective chart review of patients having sitagliptin exposures. Results: A total of 72 sitagliptin exposures resulted in any clinically significant hypoglycemia and the majority of the hypoglycemia cases involved polydrug ingestions. All of the hypoglycemia cases involved polydrug ingestions. Only one occurred in the absence of another hypoglycemic agent. That was an intentional poly-drug ingestion of olmesartan, naproxen, pregabalin and sitagliptin in unknown quantities. The others occurred after a double dose of insulin and sitagliptin and a double dose of glyburide and sitagliptin. This study is limited by its retrospective nature, the number of cases reported and its reliance on patient histories. Conclusion: This is the first study of sitagliptin in overdose. Overall, sitagliptin overdoses appear to have a very low risk of clinically significant hypoglycemia and the majority of cases could be safely managed at home. When taken with other antihyperglycemic agents, greater care should be taken as the risk of hypoglycemia increases. Further research is needed to better define the clinical effects of sitagliptin as the drug’s use increases.

169. The Works

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Background: The cause of coagulopathy, a known complication of HCl ingestion, is not well documented. We present 2 cases of coagulopathy following HCl ingestion. Case 1: A 5yr old presented with emesis 30min after drinking 1-2cups of The Works toilet bowl cleaner 10hrs later. She expired 17hrs after ingestion. Case 2: A 3yr old presented after ingesting an unknown amount of acetaminophen, zolpidem, and clonazepam, followed by The Works toilet bowl cleaner 10hrs later. She expired 17hrs after ingestion. Conclusion: These cases remind practitioners of the coagulopathic potential of HCl.


Spyker DA,1 Cantilena LR,1 Bronstein AC.2
1American Association of Poison Control Centers, Bethesda, MD, USA; 2Rocky Mountain Poison & Drug Center, University of Colorado School of Medicine, Denver, CO, USA.

Background: NPDS provides poison centers the opportunity to examine national aggregate human exposures, animal exposures, and information calls for each AAPCC generic category (926 minor grouped into 161 major). Methods: We ran NPDS enterprise reports for years 2000-2008 and examined the change over time in human exposures, the absolute (linear regression of calls/year) and relative (doubling time from linear regression of log-calls/year) for each major generic category and total exposures. Of the 162 major categories, the linear and 111 of the log regressions were statistically significant (p < 0.05, 2000-2008, N = 9). The table shows the top 20 major categories (with p < 0.05), number of 2008 calls, and the mean rate of increase (doubling time in years). Conclusion: These quantitative trend descriptions suggest where poison center effort could focus interventions and training to help predict future workload, and demonstrate the inherent value in NPDS data by generic category over time.
### 171. Severe Hemolysis in Pediatric Case after Ingestion of Miracle Mineral Solution

Williams SR, Dawling S, Seger DL.
Vanderbilt University Medical Center, Nashville, TN, USA.

#### Intro:
Alternative medicines are available in the home and are a possible source of unintentional ingestion in young children. Occasionally, these toxicants are a source of morbidity. Case report: A 32 month old previously healthy child was found with an open container of Miracle Mineral Solution. The family thought he had taken a swallow even though the customary dose is only a few drops. The child was given an unknown dose of oral charcoal by the family. On arrival to the Emergency Department, the child was listless and pale. His heart rate was 140, blood pressure 106/40, with a pulse oximeter reading of 82% on nonrebreather oxygen mask. His arterial blood gas on supplemental oxygen demonstrated a pH of 7.41 with pO2 of 243 mmHg and pCO2 of 32 mmHg with methemoglobin level of 9.4%. His hematocrit (Hct) was 31 g/dL, total bilirubin 4.3 mg/dL, haptoglobin 1 mg/dL, and LDH (methgb) level 11.18 Misc Muscle Relaxants. Urine drug screen, APAP and salicylate levels were all negative. Repeat labs revealed a persistent anion gap metabolic acidosis. In the ICU, she was hemodynamically unstable for 24 hours requiring norepinephrine infusion. During that time she received multiple dose activated charcoal. She developed severe rhabdomyolysis with creatine kinase CPK peak over 500,000 U/L. Her initial ECG showed ST depression in leads II, III, and aVF with hyperacute T waves in leads V2-V5. After transfer to a tertiary center 9 hours post ingestion, his blood pressure was 117/56 mmHg, heart rate 100 bpm. ECG had ST depression in leads V3-V6 with a QTC of 610 ms, and the troponin I was 0.51 ng/mL. The troponin I continued to rise to 6.81 ng/mL at 19 hrs and 17.91 ng/mL at 27 hrs post ingestion. The patient was treated with IV fluid boluses, gastric lavage, endoscopy, dicrosmal, mechanical ventilation, vasopressors and continuous venovenous hemofiltration. The patient died approximately 32 hours post-ingestion from multisystem organ failure. Risk factors for acute methemoglobinemic arsenic concentration was 264 μg/L. Discussion: A variety of ECG findings may be seen with acute arsenic poisoning including conduction blocks, QT interval prolongation, T wave changes, as well as ventricular tachycardia and fibrillation. Cardiovascular complications and cardiomyopathy have been described after chronic arsenic exposure. Conclusion: This case of acute PA toxicity demonstrated early laboratory and ECG signs of cardiac ischemia before refractory hypotension and multi-system organ failure developed. These findings suggest that acute cardiac ischemia may result from acute PA induced reduction in myocardial ATp production, and free radical generation.

### 174. Elevated Glycolate Levels after Unintentional Pediatric Ethylene Glycol Ingestion

Holland MG,1 Stork CM,2 Hodgman MJ,3 Rosano T,4,5
1SUNY Upstate Medical University, Department of Emergency Medicine, Upstate New York Poison Center, Syracuse, NY, USA; 2Albany Medical Center, Albany, NY, USA.

#### Background:
Glycolic acid levels, though not routinely performed, can be a useful adjunct in the diagnosis of ethylene glycol exposure/poisoning. Case report: A 4 y-o male was noted to have some lethargy and had complaints of headache and dark brown urine the evening prior to admission. The morning of admission, he had ataxia and slurred speech. Work-up for meningitis, including LP, blood cultures and Head CT were all negative. Laboratory values noted an anion gap acidosis and was transferred to the Pediatric Center. Laboratory values upon admission revealed: Arterial Blood Gas: pH 7.282, PCO2 17.5 pO2 119 Na137; Cl109; CO3 13; K 4.1; BUN 11 Cr 0.6; glucose 92; acetone negative. Ethylene glycol (EG) was equivocal at 5.1 mg/dL (LOQ 5 mg/dL). Later analysis of this specimen confirmed a glycolic acid level of 31 mg/dL. Icascorbonate drip was started and he was admitted to the ICU, fenretimide was administered, and arrangements were made for possible hemodialysis. However, he did well with hydration and alkalization, and was discharged home in good condition after 3 days. Due to unexplained ethylene glycol poisoning, the tertiary care facility was able to perform ethylene glycol and glycolic acid analysis on blood from referring hospital that had been frozen and saved. After confirmation of ethylene glycol poisoning, a Child Protective Services investigation was started, centering suspicion on the child’s babysitter. Case discussion: Ethylene glycol poisoning can be missed if all of the parent compound has been metabolized into ethylene glycol and glycolic acid levels.

<table>
<thead>
<tr>
<th>Time of Blood Draw</th>
<th>Ethylene Glycol Level (mg/dL)</th>
<th>Glycolic Acid Level (mg/dL)</th>
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<tbody>
<tr>
<td>Day 1: 0915</td>
<td>43</td>
<td>82</td>
</tr>
<tr>
<td>Day 1: 1036</td>
<td>28</td>
<td>61</td>
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<td>Day 1: 1855</td>
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<td>Day 1: 2310</td>
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<tr>
<td>Day 2: 1043</td>
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#### Ethylene glycol and glycolic acid levels

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<td>Day 2: 1043</td>
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#### Discussion:
The fact that this product is readily available without prescription highlights a flaw in federal regulations.

### 175. Direct Cardiototoxicity from an Acute Pentavalent Arsenic Ingestion

Gentry NL,1 Cumpton KL,2 Rose SR,1,2
1Department of Emergency Medicine Virginia Commonwealth University, Richmond, VA, USA; 2Virginia Poison Center, Richmond, VA, USA.

#### Background:
Inorganic trivalent (TA) and pentavalent (PA) arsenic are commonly found in vivo. TA binds to sulfhydryl groups and inhibits glycolysis and the Kreb’s cycle. PA replaces phosphate in ATP and uncouples oxidative phosphorylation, and arsenic can produce oxygen free radicals. Acute arsenic cardiotoxicity is commonly manifested as dysrhythmias. We present a case with evidence of both dysrhythmia and direct myocardial ischemia from PA. Case report: A 57 yo healthy male intentionally ingested 3 grams of granular PA and presented to the emergency department 6.5 hours later with nausea, hematemesis and abdominal pain. His initial ECG showed ST depression in leads II, III, and aVF with hyperacute T waves in leads V2-V5. After transfer to a tertiary center 9 hours post ingestion, his blood pressure was 117/56 mmHg, heart rate 100 bpm. ECG had ST depression in leads V3-V6 with a QTC of 610 ms, and the troponin I was 0.51 ng/mL. The troponin I continued to rise to 6.81 ng/mL at 19 hrs and 17.91 ng/mL at 27 hrs post ingestion. The patient was treated with IV fluid boluses, gastric lavage, endoscopy, dicrosmal, mechanical ventilation, vasopressors and continuous venovenous hemofiltration. The patient died approximately 32 hours post-ingestion from multisystem organ failure. Risk factors for acute methemoglobinemic arsenic concentration was 264 μg/L. Discussion: A variety of ECG findings may be seen with acute arsenic poisoning including conduction blocks, QT interval prolongation, T wave changes, as well as ventricular tachycardia and fibrillation. Cardiovascular complications and cardiomyopathy have been described after chronic arsenic exposure. Conclusion: This case of acute PA toxicity demonstrated early laboratory and ECG signs of cardiac ischemia before refractory hypotension and multi-system organ failure developed. These findings suggest that acute cardiac ischemia may result from acute PA induced reduction in myocardial ATp production, and free radical generation.
toxic metabolites and patients present with severe metabolic acidosis of unknown etiology. Blood frozen from presentation can be retrospectively analyzed for glycoregulation to confirm the diagnosis. Glycolytic acid analysis is a useful analysis to confirm ENOS exposure, especially in late-presentation cases.

175. Does Postmortem Toxicological Analyses of Tetrahydrocannabinol (THC) in Accident Patients Accurately Identify Its Physiologi- cal Impairment at the Time of Accident? Pruchnicki SA. Central Ohio Poison Center Nationwide Children’s Hospital, Columbus, OH, USA.

Objectives: Postmortem toxicological testing performed by the Civil Aviation Medical Institute (CAMI) is routine after a fatal aviation accident. Potentially significant amounts of postmortem drug redistribution are well described in the literature. If not accounted for when interpreting postmortem drug levels, determination of drug physiological impairment as being responsible for accident causation is a questionable practice. Methods: We searched the National Transportation Safety Board’s (NTSB) database from 1996 to 2006 to find cases where toxicological findings were primary for determining causation. Our search yielded 109 cases out of the 59,899 cases in the database where we found 15 where solely THC impairment was identified as having a role in accident causation. Toxicology reports for each pilot victim were reviewed specifically examining the blood concentration of both THC and the metabolites 11-Hydroxy THC (active) and THC Carboxylic Acid (inactive). We compared these values with the suggested values for THC impairment and the additional consideration of possible postmortem redistribution to determine if accident causation from THC impairment was supported. Results: Of 503 pilots included in the study, we found 10 cases where at that nothing to the patient after admission and 142 mg/kg (16.1) for IV. Total NAC dosages in the >100kg group: 13 (35.1%) received oral NAC for 24 hrs in 17 (45.9%). There were 19 (51.4%) acute, 8 (21.6%) repeated, and 10 (27%) unknown ingestions. In the >100kg group 13 (35.1%) received oral NAC for initial treatment, 23 (62.2%) IV, and 1 (2.7%) unknown. Mean loading dose was 135 mg/kg (SD 12.6) for oral administration and 142 mg/kg (16.1) for IV. Total NAC exposure was 15.9 gm (SD 3.9) and 25 gm (2.7) for IV. Outcomes included hepatic toxicity in 13 of 32 (40.6%), 0 transplants, and 3 of 36 (8.3%) deaths. Of 12 patients evaluable with the Rumack-Matthew nomogram, 3 of 5 high-risk cases developed hepatic injury. 10 (27.0%) related AEs (all vomiting and non-serious) occurred in the >100kg group: 8 with IV, 2 with oral NAC. There were no anaphylac-

toid reactions. Conclusion: Patients over 100kg appeared to be protected without weight-based dosing.

179. Acetylcysteine (NAC) Use for Acetaminophen (APAP) Overdose in Patients Weighing over 100kg. Varney SM,1,2 Buchanan JA,1,2 Heard K,1,2 Rush University Medical Center, Chicago, IL, USA; 1University of Colorado Denver School of Medicine, Aurora, CO, USA.

Background: NAC dosing for APAP poisoning in patients weighing over 100kg. The study aim was to describe demographics, intrometabolism and outcomes of patients weighing over 100kg treated with oral or IV NAC for APAP poisoning. Methods: Patients were identified from a multicenter retrospective safety study of NAC for APAP overdose. We included patients with a recorded weight of >100 kg. Charts were double abstracted by trained abstractors using a standardized form. Data collected included demographics, patient weight, maximum serum APAP and ALT, coingestants, NAC loading dose, acute vs. repeated ingestion, adverse events (AEs) and outcome (hepatotoxicity [ALT > 1000 U/L], transplant, or death). Descriptive statistics were used. Results: 503 patients included in the study: 223 (37.7%) were weighed >100kg, and 21 had no weight recorded. Mean age for >100kg patients was 40.0 years (SD 13.8), mean weight 114.9 kg (13.3) [range 101–160], with 54.1% females. Concomitants included alcohol in 5 (13.5%), antinastamines in 6 (16.2%), and opio- ids in 17 (45.9%). There were 19 (51.4%) acute, 8 (21.6%) repeated, and 10 (27%) unknown ingestions. In the >100kg group 13 (35.1%) received oral NAC for initial treatment, 23 (62.2%) IV, and 1 (2.7%) unknown. Mean loading dose was 135 mg/kg (SD 12.6) for oral administration and 142 mg/kg (16.1) for IV. Total NAC exposure was 15.9 gm (SD 3.9) and 25 gm (2.7) for IV. Outcomes included hepatic toxicity in 13 of 32 (40.6%), 0 transplants, and 3 of 36 (8.3%) deaths. Of 12 patients evaluable with the Rumack-Matthew nomogram, 3 of 5 high-risk cases developed hepatic injury. 10 (27.0%) related AEs (all vomiting and non-serious) occurred in the >100kg group: 8 with IV, 2 with oral NAC. There were no anaphylac-
him hypotensive (systolic blood pressure of 40–60 mmHg), obtunded, with swollen tongue. His left hand had two puncture marks with local swelling and redness. He received normal saline fluids, atropine, epinephrine and dopamine, diphenhydramine, methylprednisolone, sodium bicarbonate, and ondansetron. He received six vials of CrewFab™ prior to transfer to our trauma center. On arrival, he was awake, alert, with stable vital signs (T 36.3, P 97, R 24, BP 109/79 mmHg, O2 saturation 98% on O2 at 2 L/min). He had mild swelling and erythema of the hands and wrists. He received no antivenin, was quickly weaned off epinephrine in the ED, and was admitted for observation. He had no progression of swelling beyond the wrist, had normal platelet counts (range 134 to 156 K/µm) and coagulation studies (INR range 1.24 to 1.25, PTI range 15.7 to 16.1 sec; fibrinogen 271 mg/dL), and was discharged 48 hours later with no complications. Discussion: Anaphylaxis rarely occurs with snake bites, unless prior similar snake bites have occurred. It may be IgE mediated. CrewFab™ might be helpful in envenomations by the eyelash viper, a South American crotalid. However, in this case anaphylactic shock was more likely than severe envenomation given the rapid improvement after diphenhydramine and epinephrine, the mild local symptoms, and the normal laboratory studies. Conclusion: Patients with repeated snake bites could present with explosive type I hypersensitivity reactions and anaphylaxis after a repeat venomous snake bite.

181. When Yellow and Blue Make Patients Green: Nitroalnine Cases at Multiple Hospitals Scaulo AJ,1,2,3 Tomnick RL,1,2,3 Moore JC,1,2 Weber JA1 1MO Regional Poison Center, St. Louis, MO, USA; 2CCCMC, MO, USA; 3SLU, MO, USA.

Background: Malicious deployment of a chemical agent might result in simultaneous presentation of acutely ill patients (pts) to multiple facilities (HCFs) as “unknowns.” An actual exposure scenario challenged the Poison Center (PC), HCFs and EMS agencies. Case report: 9 men were exposed to p-nitroalnine during questionable activities on a holiday weekend at a plant. When symptoms began, 2 pts later, they agreed to present to different HCFs with misidentified the agent as organophosphate. HCFs looked green in color; 1 unconscious and 2 vomiting, regarding pts exposed to chemicals with severe respiratory symptoms and includes dizziness, headache and malaise, followed by visual disturbances in one of three patients. There is a latent period of 12 to 20 hours. The most common pathological findings include necrotic areas of the putamen region and in some cases we can find hemorrhagic regions. Moreover, coagulation changes around the brain white matter Conclusion: Although the early brain CT scan can show no lesions, the late CT show an important percentage of lesions in the putamen region.

182. Methanol Poisoning with Putaminal Necrosis. Late CT Findings in Emergency Department Garcia C, Quispe Y. Guillermo Almenara Irigoyen National Hospital, Lima, Peru.

Summary: During 2007 6 cases of methanol poisoning attended at the emergency department of Guillermo Almenara Irigoyen National Hospital, in which CT scans appeared in the first day were normal and after three days CT scans of most of them showed putaminal lesions. Introduction: Putaminal necrosis is the well known lesion in the brain that can be identified on computed tomography. There are other brain lesions like necrotic lesions in the brain white matter. Methods and results: During 2007 23 patients with methanol poisoned were attended at the emergency department of Guillermo Almenara National Hospital, in Lima – Peru. Seven of them died in their first day in the hospital. Because of their critical condition. Five patients entered the ICU department and the other ten patients were attended at the emergency department during at least the first five days. All the patients underwent the known treatment which consisted in ethanol treatment and haemodialysis. We took brain CT scans to 10 patients in the first and the third day. Six of them showed putaminal lesions (60%) in the the second brain CT scan. Discussion: Initial presentation usually includes central nervous systems symptoms and includes dizziness, headache and malaise, followed by visual disturbances in one of three patients. There is a latent period of 12 to 20 hours. The most common pathological findings include necrotic areas of the putamen region and in some cases we can find hemorrhagic regions. Moreover, coagulation changes around the brain white matter Conclusion: Although the early brain CT scan can show no lesions, the late CT show an important percentage of lesions in the putamen region.

183. Perilous Propositions: Intubating the Salicylate-Late Poisoned Patient Lu JJ1, Kalimullah EA,1,2 Bryant SM.1,2 1Cook County-Stroger Hospital, Chicago, IL, USA; 2Illinois Poison Center, Chicago, IL, USA.

Introduction: Cardiac arrest occurring shortly after the intubation (ETI) of salicylate (ASA) poisoned patient has been reported. While worsening acidoisis and hypercapnia have been implicated, the role of hyperventilation is unclear and ventilator management has not been well-described. Case series: Poison center charts were reviewed from 7-01-04 through 12-31-08 to include patients with peak ASA levels of >200 mg/dL. Particular attention was paid to: 1) available pre- (PRE) and post-intubation (POST) arterial blood gases (ABG) with significant acetaminophen overdose in newborn that was successfully treated with an extended course of NAC. The child had only mild elevations in the transaminases and INR.

Table 1. Case# Age/sex Peak ASA (mg/dL) PRE pH/pCO2 Vent ?TVT (mL) HD before/after NaHCO3 Death

#1 66y/f 74.6 7.58/18.4 18/500 Y/before Y/before Y/before Y/before Y/before N

#2 36y/m 94 7.33/20 20/800 Y/before Y/before Y/before Y/before Y/before N

#3 20y/f 89 7.4/15.2 30/500 Y/before Y/before Y/before Y/before Y/before N

#4 71y/m 101 7.55/15 16/500 Y/before Y/before Y/before Y/before Y/before N

#5 56y/m 45 7.36/9.6 22/700 Y/before Y/before Y/before Y/before Y/before N

#6 36y/f 94 7.33/20 30/500 Y/before Y/before Y/before Y/before Y/before N

#7 25y/f 94 7.1/30 na na Y/before Y/before Y/before Y/before Y/before N

#8 48y/f 94 na na Y/before Y/before Y/before Y/before Y/before N

Post-intubation (POST) arterial blood gases (ABG) with significant acetaminophen overdose in newborn that was successfully treated with an extended course of NAC. The child had only mild elevations in the transaminases and INR.

184. A Therapeutic Misadventure: Prolonged Elimination Half Life of Acetaminophen in a 3 Day-Old Child Lintner CP, Bilden EF, Kwon SK. 1Cook County-Stroger Poison Center, Minneapolis, MN, USA.

Background: Acetaminophen is a commonly used analgesic. We report an acetaminophen overdose in a 3 day­ old child due to a therapeutic error resulting in an elevated blood level and a significantly prolonged elimination half-life. Case report: A 3 day-old infant was mistakenly given 3 doses of acetaminophen (APAP) each containing 151 mg/kg, resulting in a total dose of 453 mg/kg of acetaminophen in a 24-hour period. The mother was instructed to bring the child to the emergency department (ED). In the ED, the patient’s APAP blood level was 312.6 mcg/mL with normal hepatic transaminases. This level was drawn approximately 5 hours after administration of the last dose of APAP. The patient was started on IV N-acetylcysteine (NAC). Thirteen hours after the last dose, lab results included an APAP level of 241 mcg/mL, AST 70 IU/L, ALT 24 IU/ L, and INR 1.1. Labs 24 hours after the last dose, showed an APAP level of 148.5 mcg/mL, AST 47, ALT 23, and INR 2.05. Fresh frozen plasma was given. The child was asymptomatic. Labs, 63 hours post exposure, showed APAP less than 2 mcg/mL, AST 42, ALT 35, and INR 1.1. The IV NAC was continued throughout this timeframe. Labs, 72 hours post exposure, showed AST 31 and ALT 35. NAC was discontinued at this time. 96 hours post exposure; AST was 22 and INR 1.1. The infant was discharged home. Discussion: In this case, the decision was made to treat with NAC therapy only. Other treatments were not pursued because of the critical condition and remained asymptomatic. The case was also unique in that the elimination half-life (T1/2) of APAP was prolonged, with an apparent T1/2 of approximately 11.4 hours over a 43-hour period. Because of the prolonged half life, an extended course of NAC therapy was indicated. Conclusion: We present a unique case of a significant acetaminophen overdose in newborn that was successfully treated with an extended course of NAC. The child had only mild elevations in the transaminases and INR.
185. Did Massive Recall of Digitek® Tablets Increase Number of Digoxin Exposures to a Poison Control System? Nordt SP,1,2* Mera D,1,2 Piatt FL,1,3,4 Tomaszewski C,1,2 Miller A,1,2 Kreshak A,1,2 Carstairs S,1 Clark RF,1,3
1Division of Medical Toxicology and Department of Emergency Medicine, University of California, San Diego, San Diego, CA, USA; 2Veterans Administration, La Jolla, CA, USA; 3California Poison Control System, San Diego, CA, USA; 4UCSD Skaggs School of Pharmacy, La Jolla, CA, USA; 5UCSF School of Pharmacy, San Francisco, CA, USA.

Introduction: Digoxin has a narrow therapeutic index with high incidence of morbidity and mortality. In April 2008, manufacturer Actavis recalled Digitek® digoxin tablets as it may contain duplicate labeled amount of drug. Recall to March 2006 involving 800 million tablets. Null hypothesis: no increase in moderate, major or death outcomes secondary to manufacturing error. Methods: Retrospective review of all digoxin exposures to a poison control system from March 2008 to February 2008. Data extracted from electronic database using terms: digoxin, digitek, lanoxin comparing two time intervals: 1) 03/04-02/06 (before manufacturing error) and 2) 03/02-03/08 (after manufacturing error). Total numbers of exposures were identified. Cases with moderate, major or death were death were also identified and tallied. Chi square analysis was performed. Results: From 03/04-02/06 there were a total of 679 digoxin exposures. Of these, 148 had outcome of moderate, major or death(22%). All except one moderate case was managed at a health care facility. Of these, 165 had an outcome of moderate, severe or death(27%). There were 137(23%) moderate, 26(4%) major and 5(0.7%) deaths. In the period from 03/06-02/08, there were a total of 610 cases. All were managed at a health care facility. Of these, 165 had an outcome of moderate, severe or death(27%). There were 137(23%) moderate, 26(4%) major and 5(0.3%) deaths. There was statistically significant increase in total number of moderate, major and deaths after manufacturing error period than the pre-recall period (p = 0.031) and after manufacturing error, there was a statistically significant increase in digoxin exposures with moderate, major or death outcomes. However, a decrease in the percentage of deaths. The recall of Digitek® tablets may have increased moderate, major or death outcomes from digoxin exposures in a poison control system database. Larger, retrospective studies are required to confirm our findings.

186. The Current Status of the Practice of Inpatient Medical Toxicology at the Bedside in the US

Wat PM,1,2* Brent J.1,2
1University of Texas, Southwestern, Dallas, TX, USA; 2University of Colorado, Denver, CO, USA.

Background: Traditionally, the provision of medical toxicology (MT) consultation to patients has occurred remotely over the telephone as a poison center service. In recent years, an increasing number of medical toxicologists have established consultative and inpatient services where the delivery of consultation has shifted to the bedside. This bedside consultation model is comparable to the standard practice pattern of most other medical specialties. We investigated the current prevalence of bedside toxicology practice in the U.S. Methods: An electronic survey was sent to all American College of Medical Toxicology (ACMT) members asking questions on bedside MT practice patterns. An inpatient MT practice was defined as providing care to the patient at the bedside either as a consultant or as the inpatient attending. Care delivered to the patient at the bedside. The aggregate numbers at the bedside and record the number of patients that they see each year. The aggregate numbers of patients seen in the past year by these centers exceeded 14,000. Individual centers reported seeing between 800-1000 patients per year. Most respondents expressed an interest in participating in a national research network and/or bedside-based toxicoscopus surveillance system. Conclusions: This is the first national survey of the actual state of inpatient MT practice in the U.S. Although a historic comparison of prevalence of this type of practice is not available, it appears that there is growing differential of patients at all in patients less than 20 years of age and a significant potential for multi-center collaborative research and surveillance.

187. National Survey for Epidemiology of Parataquat Poisoning in Korea

Lee MJ,1,2 Roh HK,1,2* Kimck Cho,1,3 Miller A,1,2 Kreshak A,1,2 Carstairs S,1 Clark RF,1,3
1Division of Medical Toxicology and Department of Emergency Medicine, University of California, San Diego, San Diego, CA, USA; 2Veterans Administration, La Jolla, CA, USA; 3Veterans Administration, San Diego, CA, USA; 4UCSD Skaggs School of Pharmacy, La Jolla, CA, USA; 5UCSF School of Pharmacy, San Francisco, CA, USA.

Introduction: Parataquat poisoning by ingestion is often fatal. Most parataquat poisoning studies conducted in various countries were retrospective or simple collection of individual reports in prospective studies. Although all these data are not sufficient to understand overall parataquat poisoning, it is helpful to compare epidemiological status between different countries or regions. In this study, we described epidemiologic status of parataquat poisoning in Korea, which was based on parataquat poisoning studies conducted in the actual state of pesticide poisoning in Korea and guidelines for diagnosis and treatment of pesticides poisoning. Method: Research on the actual state of acute pesticide poisoning in Korea was conducted through 38 large hospitals nationwide from August 2005 to July 2006. Outcomes of parataquat intoxication were categorized as recovery or death. Results: Total 610 patients were identified. Of the 520 intoxicated patients with parataquat, male was 63.1% and the median age was 54 years. The incidence of parataquat poisoning was high between the ages of 40 years old whose median age was 16.5 years. Most frequent clinical manifestations were nausea (32.9%) and vomiting (32.7%), followed by irritable sty (30.3%), confusion (19.4%), dyspnea (19.4%), sore throat (17.7%). Overall fatality rate of parataquat was 73.5%. The fatality rates of parataquat poisoning increased with the amount ingested. The parataquat volume ≤50ml contributed 5.3% to the fatality, >50-100ml 10.2%, >100-200ml 51.4%, >20-40-5ml 68.3%, >40-60ml 81.3%, >60-100ml 92.9%, >100-200 95.1%, >200ml 100%. Conclusion: The overall fatality rate in Korea was 73.5%, which is similar with other countries or regions. The results indicated that parataquat is potentially lethal in humans, and the risk of fatality is directly related to the amount ingested and absorbed.

188. Dramatic QTc Narrowing after Intralipid Administration in Quetiapine Overdose

Lu JL,1,2 Hast HA,2* Erickson TB,1
1Cook County-Stroger Hospital, Chicago, IL, USA; 2University of Illinois, Chicago, IL, USA.

Background: QTc prolongation can be caused by various drugs including antipsychotics, which have been reported to cause sudden death through torsade de points (Tdp). QTc intervals >500ms or >60ms from baseline are associated with an increased risk of Tdp, although no reliable tool can accurately predict its development. Case Report A 16 year-old girl with bipolar disorder and recent gastrostomy for battery ingestion was transferred to the intensive care unit from the psychiatric ward after ingesting 38 tablets of quetiapine. A QTc interval >500ms was noted after each dose and hoarding in a sock. Other medications included lamotrigine and lithium (Li+) She was hypotensive (70/50), tachycardic (150b), and stuporous, responsive to first deep pain stimuli. She had inaudible respiration sounds, but maintaining oxygenation on a non-rebreather mask. Labs: pH 7.31, K+ 3.8, CO2, 21. Cr 0.9, Glu 183, Mg2+ 2.9, Serum Li+ levels were therapeutic. EKG: Sinus at 127 bpm, QRS 023s, and QTc of 610ms (baseline 462ms). Due to mental status depression, hypotension, and extremely prolonged QTc with concern for generation of cardiac rhythm, intradose was administered. A one hundred milliliter (mL) bolus of a 20% lipid emulsion was given intravenously over 5 minutes, followed by a 420 mL infusion over one hour. Within half an hour, the QTc interval narrowed to 433ms. Two hours after completion of the infusion, the QTc was 652ms. By morning, the QTc had normalized and remained at baseline. Her GCS improved from 7 to 10 shortly after the infusion was completed. She was discharged 7 days later. Eleven hours after her ingestion, she was alert and speaking clearly. A lamotrigine level was 1.3 mcg/mL (3.0-14.0). Discussion: Successful resuscitations from cardioversion of local anesthetics and selected lipophilic agents using intralipid “rescue” therapy have been reported. A temporarily-associated narrowing of the QTc occurred in this case after initiation of intralipid, with recurrent widening upon its discontinuation. There may have also been some benefit in recovery time to baseline mental status. Conclusion: We present a case of QTc narrowing occurring with intralipid infusion. Further investigation of intralipid effects on drug-induced prolonged QTc may be warranted.

189. Comparison of a Toxicology Fellowship Caseload with the Core Content of Medical Toxicology – Implications for Training and the New ToxIC Group

Kleinschmidt KC, Wax PM.
University of Texas Southwestern Medical Center, Dallas, TX, USA.

Introduction: The 2003 Core Content of Medical Toxicology (CCMT) was created to provide “the organizational framework for the development of the medical toxicology certification examinations & details the knowledge to be tested...”. It also serves “as a template for the development of medical toxicology fellowship curricula.” One of the 5 sections of the CCMT addresses specific toxicants. Questions have been raised as to the use of the CCMT for the creation of the board exam versus the caseload that toxicologists actually manage. Also, the ACMTs newly created Toxicology Investigators Consortium (ToxIC) provides an opportunity for programs to join in multicenter clinical research. Knowledge of program caseloads will assist the ToxIC group in assessing possible research. Purpose: To compare the patient caseload from a toxicology fellowship to the “Toxins & Toxicants” section of the CCMT & to provide a framework for discussion of research opportunities for the ToxIC group. Methods: The caseload of the fellowship is maintained in a spreadsheet that was formatted to look like the CCMT. The spreadsheet was queried. Results: The fellowship caseload includes 1312 exposures. The CCMT catego-
and subcategories of the “Toxins and Toxictants” section of the CCMT had very few exposures. This reflects that debate, about the use of the CCMT for the development of toxicology fellowship curricula, is appropriate. Also, concerns over the use of the CCMT to develop the toxicology board exam are understandable. Program Directors must adjust the didactic portions of their programs accordingly. Opportunities for combined clinical research for the new ToxIC were delineated.

190. Acute Encephalopathy with Concurrent Metabolic and Respiratory Disturbances in First Known Human Ingestion of Banamine (Flunixin Meglumine) and Acepromazine

Wilson AC, Spillane LL.
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Banamine is a potent, non-narcotic, non-stereoidal, analgesic agent recommended for musculoskeletal disorders in horses. Lethargy, weight loss and rare fatalities have been reported in horses. Acepromazine is a potent neuroleptic agent used as a tranquilizer, anti-emetic, and antiprretic in dogs, cats and horses. It has been known to cause a respiratory secondary to bronchodynia and hypotension and rarely seizures. There are only a few case reports of human ingestion of acepromazine and none of the combination.

We report a 43 year old female who works as a horse trainer who presented with altered mental status after an intentional ingestion of an unknown amount of Banamine and acepromazine. The patient was awake but confused and lethargic; oriented to person only. Vital signs were stable. Physical exam was otherwise normal. Laboratory abnormalities included a pH of 7.57 with potassium of 2.6meq/L and CO2 of 16 mmol/L. AST/ALT were elevated, respectively. Her chest x-ray and head CT scan were normal. A urine tox screen was negative for benzodiazepines. Levels of Banamine and acepromazine were not performed. Her hospital course was complicated by worsening alkalemia, an upper GI bleed (requiring transfusion) and elevated liver enzymes. Her metabolic/respiratory derangements and encephalopathy cleared with supportive measures.

Patient was discharged home after 6 days with psychiatry follow-up on outpatient basis.

Human ingestion of medication prescribed for animals is not common. In this case, the patient had access through her work as a horse trainer. The mental status changes seen in this patient were possibly due to either medication or the co-administration. The gastrointestinal bleed may have been due to the Banamine. Human exposure to both medications cannot always be predicted by their effect in animals.

191. Fatality from Ammonium Bifluoride Poisoning

Chuang R,1,3 Exelbert EJ,2 Heard KJ.1,3
1Rocky Mountain Poison & Drug Center–Denver Health, Denver, CO, USA; 2University of Colorado Denver School of Medicine, Aurora, CO, USA.

Background: In 1998 authorities in the United Kingdom (UK) restricted sale of acetaminophen (APAP) to APAP tablets only to discourage consumption in pharmacies. The authors of this review identified an increased ingestion of blood-tinged saliva. The exact product was not identified. A 3-year-old girl presented to the Emergency Department (ED) with blood-tinged saliva. The exact product was not identified. The initial diagnosis of ammonium bifluoride poisoning was made because the symptoms were similar to those reported in the UK. The patient had access to a few case reports of human ingestion of acepromazine and none of the combination.

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Patient was discharged home after 6 days with psychiatry follow-up on outpatient basis.

Human ingestion of medication prescribed for animals is not common. In this case, the patient had access through her work as a horse trainer. The mental status changes seen in this patient were possibly due to either medication or the co-administration. The gastrointestinal bleed may have been due to the Banamine. Human exposure to both medications cannot always be predicted by their effect in animals.

192. How Many Acetaminophen Pills Do Suicidal Patients Ingest?

Lavonas EJ,1,2 Reynolds KM,1 Green JL,1 Dart RC.1,2
1Rocky Mountain Poison & Drug Center–Denver Health, Denver, CO, USA; 2University of Colorado Denver School of Medicine, Aurora, CO, USA.

Background: In 1998 authorities in the United Kingdom (UK) restricted sale of acetaminophen (APAP) to APAP tablets only to discourage consumption in pharmacies. The authors of this review identified an increased ingestion of blood-tinged saliva. The exact product was not identified. A 3-year-old girl presented to the Emergency Department (ED) with blood-tinged saliva. The exact product was not identified. The initial diagnosis of ammonium bifluoride poisoning was made because the symptoms were similar to those reported in the UK. The patient had access to a few case reports of human ingestion of acepromazine and none of the combination.

We report a 43 year old female who works as a horse trainer who presented with altered mental status after an intentional ingestion of an unknown amount of Banamine and acepromazine. The patient was awake but confused and lethargic; oriented to person only. Vital signs were stable. Physical exam was otherwise normal. Laboratory abnormalities included a pH of 7.57 with potassium of 2.6meq/L and CO2 of 16 mmol/L. AST/ALT were elevated, respectively. Her chest x-ray and head CT scan were normal. A urine tox screen was negative for benzodiazepines. Levels of Banamine and acepromazine were not performed. Her hospital course was complicated by worsening alkalemia, an upper GI bleed (requiring transfusion) and elevated liver enzymes. Her metabolic/respiratory derangements and encephalopathy cleared with supportive measures.

Patient was discharged home after 6 days with psychiatry follow-up on outpatient basis.

Human ingestion of medication prescribed for animals is not common. In this case, the patient had access through her work as a horse trainer. The mental status changes seen in this patient were possibly due to either medication or the co-administration. The gastrointestinal bleed may have been due to the Banamine. Human exposure to both medications cannot always be predicted by their effect in animals.
McFee RB, Caraccio TR.
LI Regional Poison Center, Winthrop University Hospital, Mineola, NY, USA.

Background: Radioactive materials are ubiquitous and readily divertible. Anecdotal reports of MD threat and patient encounters evidence, opinion pieces, government reports, even the well-investigated World at Risk Report suggest radiation risk is the least taught, and greatest vulnerability in preparedness. Objectives: To determine current state of knowledge and characterize current state of research and identify radiation preparedness gaps & voids in knowledge, planning, and differences in preparedness across disciplines. Method: Multiple Medline & keyword searches (“radiation preparedness,” “physicians radiation risk terrorism” etc.) & assessment of government studies on radioprot. Inclusion criteria: all review publications/reporting of healthcare preparedness re: radiation 2002 – 2009. Exclusion criteria: op/ed, case reports or studies pre.2002. IRB exempt. Results: Each search category yielded <14 publications. Data showed concordance across studies: 1) physicians, medical trainees & emergency responders expressed concern re: knowledge, lack of practice, skills, or ability to respond to a radiation event. A study >1500 nurses revealed significant concerns on personal knowledge, and deaf/fatigue ability to respond. <40% Prehospital emergency providers feel prepared for radiologic events. A study comparing residency program training: 85% Peds, 87% FP and 21% reported little/no training in radiation; consistent with other studies comparing knowledge across specialties. Discussion: Widespread radioactive sources make it likely an accident or intentional event will occur. In this review, <40% of participants expressed a need for more training, and their ED/hospital facilities insufficiently prepared for a radiologic event. The absence of studies addressing radiation comparison to biological/chemical underscore the vulnerability. Respondents also wanted information about radiation expertise. Conclusion: This study confirms government research re: radiological threats remain the least emphasized. Toxicologists can take a greater role in radiation preparedness and are in a unique position to provide expertise & educational programming.

196. Findings in Germany Concerning Liquid Products and Substances Involving an Aspiration Risk
Hahn A, Begermann K.
Federal Institute for Risk Assessment (BfR), Berlin, Germany.

Background: Cases of hydrocarbon ingestion are frequent in man all around the world and the spectrum of the products ingested have changed from gases and paints, to fluids to tyre cleansers. Reports in Germany have often shown that only some defined liquid products and substances caused typical aspiration symptoms. For hazard assessment of liquid products and substances the BfR Documentation Centre for Poisonings analysed appropriate data pools containing poisonings with cases of aspiration in the last 20 years. Methods: The BfR Documentation Centre for Poisonings found appropriate data only in its own compulsory data collection since 1990. The main focus of the investigation of the cases of poisonings associated with aspiration risk were the symptoms like respiratory depression of breath, cyanosis, aspiration and chemical pneumonia. The investigations had been in particular: 1) cases from the spontaneous German Federal Reporting System for Poisonings “Par 16” for cases of poisonings between 1990-2008 enclosed with additional 2) cases from the BfR Study “Dangerous Lamp Oils” between 2000-2006 with reports of about 450 German children’s hospitals. Results: We found out of the total cases of 57,093 results on cases of poisoning, concerning liquid products and substances 472 cases were due to partly serious aspiration / pneumonia (330 cases with paraffine-/ petroleumdistillate-/ kerosene - containing lamp oils / grilllighters, 30 cases with solid petroleum containing insecticides, 26 cases with detergent-containing cleaners and other). Out of the total cases we could not document cases with petrol, diesel, solvents, edible oil and other hydrocarbons. Conclusion: Based on reports by German physicians (1990-2008) enclosing cases of the BfR Lamp Oil Study (2000-2006), we think a real aspiration risk is only associated with ingestion involving paraffine/petroleumdistillate and other detergents containing liquid products and substances. Based on these figures on human ingestions only distinct hydrocarbons carry a risk of aspiration and not the group in general.

197. Prolonged Acetaminophen Absorption Secondary to a Possible Pharmacobezoar
Patil N, 1,2 O’Donnell K, 1,2 Salhanick S. 1,2,3
LI Regional Poison Center, Boston, MA, USA; 1Children’s Hospital Boston, Boston, MA, USA; 2Beth Israel Deaconess Medical Center, Boston, MA, USA.

Introduction: Acetaminophen (APAP) is typically rapidly absorbed after ingestion. Though several case reports have described prolonged absorption and half-life secondary to possible pharmacobezoar formation, no radiographic or endoscopic evidence of an APAP pharmacobezoar has been reported. We report a case of Tylenol PM® ingestion with markedly decreased rate of absorption in the setting of a possible pharmacobezoar seen as abdominal x-ray. Case: A 29-year-old pre-menopausal healthy man was found unresponsive with an open bottle of Tylenol PM®. He was intubated and brought to the emergency department with the following vital signs: heart rate of 110bpm and blood pressure of 110/70 mmHg. Initial peak APAP level was 318 mcg/mL, AST/ALT were 54 and 60 IU/L, INR was 1.4, and arterial pH was 7.31. An EKG revealed a right bundle branch block with a QRS duration of 140 milliseconds (ms) and QTc of 450 ms. Intravenous sodium bicarbonate and N acetyl-cysteine (NAC) were administered with reports of about 450 German childrens’ hospitals. After presentation revealed dissemination of the nasogastric tube, suggesting a pharmacobezoar in the stomach. Post peak plasma APAP levels showed a slow decline. CVVH was initiated approximately 51 hours after presentation. An abdominal x-ray 28 hours after presentation revealed dislocation of the nasogastric tube, suggesting a pharmacobezoar in the stomach. Post peak plasma APAP levels showed a slow decline. CVVH was initiated approximately 51 hours after presentation. An abdominal x-ray 28 hours after presentation revealed dislocation of the nasogastric tube, suggesting a pharmacobezoar in the stomach. Post peak plasma APAP levels showed a slow decline. CVVH was initiated approximately 51 hours after presentation. An abdominal x-ray 28 hours after presentation revealed dislocation of the nasogastric tube, suggesting a pharmacobezoar in the stomach. Post peak plasma APAP levels showed a slow decline. ECHMO with CVVH was initiated in an attempt to remove any free fraction verapamil. The patient made a full neurological recovery. During shock, the myocardiun’s primary energy source is through carbonic hydrate oxidation of which HEI therapy is felt to make available. Verapamil is not known to be amenable to hemodialysis; however, in an overdose, we suspected that free fraction may high enough to be cleared through high-flow CVVH. Conclusion: HEI and ECHMO may be considered in a CCB toxic patient who is refractory to conventional modalities. We found that high flow CVVH was able to remove verapamil from the plasma.

198. Hyperinsulinemic Euglycemia, Continuous Veno-Venous Hemofiltration, and Extracorporeal Life Support for Severe Verapamil Poisoning: Case Report
Aaronson PM,1 Wessel SK,2 Kunisaki TA.2
1Florida/CSVI Poison Information Center, Jacksonville, FL, USA; 2Wolfson’s Children’s Hospital, Jacksonville, FL, USA.

Background: Novel approaches to the treatment of calcium channel blocker (CCB) poisonings are currently under investigation as often times treatment is refractory to initial standard of care. We report a case of verapamil toxicity for which hyperinsulinemic euglycemic (HEIE) therapy, continuous veno-venous hemofiltration (CVVH), and Extracorporeal membrane oxygenation (ECMO) was utilized. Case report: A 15-year-old female with past medical history significant for Tetrology of Fallot presented to the emergency department (ED) with a 3rd degree heart block apparently due to an intentional overdose of 35 sustained-release verapamil 120-mg tablets. Patient went into cardiac arrest and was successfully resuscitated. Post-resuscitation, the patient remained hemodynamically unstable despite calcium and vasopressor therapy. In addition, intravenous fat emulsion (IFE) was tried; however, did not yield significant hemodynamic improvement most likely due to suboptimal dosing. HEI therapy was titrated to 3 units/kg/hr of regular insulin and 30% dextrose with improvement in heart rate from 47/min to 81/min within 16 hours; however, mean arterial pressure did not improve. ECMO with CVVH was initiated in an attempt to remove any free fraction verapamil. The patient made a full neurological recovery. During shock, the myocardiun’s primary energy source is through carbonic hydrate oxidation of which HEI therapy is felt to make available. Verapamil is not known to be amenable to hemodialysis; however, in an overdose, we suspected that free fraction may high enough to be cleared through high-flow CVVH. Conclusion: HEI and ECHMO may be considered in a CCB toxic patient who is refractory to conventional modalities. We found that high flow CVVH was able to remove verapamil from the plasma.

199. Using Technology To Harness and Organize Expertise in the Development of Health Education Materials: How a Wiki Can Help You Collaborate
Hamm KM, Simeonov IM, Heard SE.
UCSF-C4 Poison Control System, San Francisco, CA, USA.

No materials were available for lead poisoning prevention educators to use with at-risk consumers on the topic of lead in imported Mexican candy. A grant provided funding to create a line of education products that would be collaboratively built by consumers with the input of a vast array of health educators. Materials had to be consumer-friendly and satisfy the content and usability needs of educators and organizations on small budgets. Collaboration with a vast array of educators and experts
in the field was imperative and the challenge was to find a way to gather input from over 50 people on all aspects of research, content development and design.

A wiki to manage content development and allow the exchange of feedback between all participating educators and experts. A wiki is a collection of web pages designed to enable anyone with access to contribute or modify content at any time. Lead poison-

201. **Bacterial (“Double Hump”) APAP Pharmacokinetics after Overdose**

Hendrickson RG, West PL, McKeeon NJ. OHSU/Oregon Poison Center, Portland, OR, USA.

Recently, several cases of acute apap OD have resulted in the [apap] increasing, then decreasing as expected, followed by another increase to a 2nd peak. We reviewed the literature describing these double peak pharmacokinetic cases to identify common characteristics, etiologies and predictability. Methods: with key-

202. **Chaos to Stability: Innovative Delivery of Drug Identification Services**

Colvin J, Tsipis G, Griffin S, Geis C. Cincinnati Drug and Poison Information Center, Cincinnati, OH, USA.

Background: The UK National Poisonous Information Service records all telephone enquiries on a database that has been specially designed for the purpose. Historically this information was held separately by the unit taking the call. In July 2007, the UK implemented a centralized database that is considered unique - the UK being the only country where all national poisoning enquiry data are held together in one place. This database contains detailed information in clearly defined and nationally agreed data fields. It has a number of important functions depending on the requirements of the user. It gives real time access for management of the assessment of a patient through a web-based interface, irrespective of where the enquiry is answered. Since enquiries to the National Poisonous Information Service are case specific, it is a requirement that patient details and all information relevant to the case are recorded, together with any management advice that is provided. When necessary other Poisons Units can access, but not alter, the database via a secure website. Details regarding the exposure, symptoms and advice given prior to their involvement is available to each Poisons Unit, thereby ensuring continuity of care for specific individuals. The database also contains data on specific and anonymized data in a range of different outputs, tailored to the specific requirements of the user. This is useful in a research context and also in identifying trends in poisoning. For example, defined subsets of data can be extracted, manipulated and then subsequently exported for analysis or graphical representation. Results: The database has been implemented across the UK in July 2007 and is used successfully for accessing data in real time when required and providing reports on poisoning trends. Conclusion: The introduction of a compre-

203. **Tramadol: Non-Narcotic or Opioid?**

Behrman AD,1 Bond GR,1 Woodward RW,2 Ho M,1 Goertemoeller SI,1 Royer C.1

1Cincinnati Drug and Poison Information Center, Cincinnati, OH, USA.
2Childrens Hospital of Cincinnati, Division of Pediatric Emergency Medicine, Cincinnati, OH, USA.

Background: Tramadol has been marketed as a non-narcotic analgesic. While this theory is popular, tramadol use is increasing. This study aims to evaluate impact of tramadol utilizing post-marketing surveillance techniques. Methods: NPDS data including every opioid exposure from 2000 through 2007 was obtained. Extracted data were entered into a SQL Server database with a multidimensional analytic architecture for analysis. Cases with tramadol as first opioid coded were identified (so each case represents a unique individual, not exposure). Information and trends assessed included (1) tramadol calls (2) tramadol calls as a percent of total pharmaceutical calls (3) tramadol as a percent of calls related to prescription opiates (4) abuse and intentional misuse as a percentage of all tramadol calls and (5) tramad

204. A Rare Clopidogrel Death in a Multidrug Suicide Attempt

McFee RB, Caraccco TR, Meintel R. University of Minnesota Poison Center, Minneapolis, NY, USA.

Background: Clopidogrel, the 2nd most prescribed drug in the world (25 million Rx 2007) is an anti-platelet drug, licensed for the prevention of ischemic events in patients with myocardial infarction (MI), stroke or vascular events at further risk for blood clots. Gastrointestinal, intracranial bleeding, atrial fibrillation and heart failure have been reported in overdose. Clopidogrel exposures and fatalities are not well described. Tess and PCC data suggest this is a safe drug with rare deaths. A Medline search revealed limited information on clopi-


Goertemoeller SI,1 Royer C.1

1Cincinnati Drug and Poison Information Center, Cincinnati, OH, USA.

Background: The NPDS data including every opioid exposure from 2000 through 2007 was obtained. Extracted data were entered into a SQL Server database with a multidimensional analytic architecture for analysis. Cases with tramadol as first opioid coded were identified (so each case represents a unique individual, not exposure). Information and trends assessed included (1) tramadol calls (2) tramadol calls as a percent of total pharmaceutical calls (3) tramadol as a percent of calls related to prescription opiates (4) abuse and intentional misuse as a percentage of all tramadol calls and (5) tramad

3. Abstracts

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the study. In the same period, pharmaceutical exposures to the NPDS database rose 30.5% (by least squares trend line). As a percent of all opioid related calls tramadol calls rose from 43% in 2002 to 17,058 (8.4%) in 2007. Of patients and adults evaluated at a healthcare facility following an exposure to tramadol as the only agent were known to experience a related seizure. All 87 deaths were in these age groups.13 Of the tramadol related calls were coded as abuse or misuse (rising from 11.1% to 14.8%) 99% of intentional abuse and misuse cases occurred in teens or adults. Tramadol has an impact on children as well. 11% of all tramadol calls in teens (4763 cases) were in children <6 years exposed unintentionally. The number of children exposed per year more than doubled over the 8 year period (from 409 to 955), but was a stable portion of tramadol calls. Conclusion: Overall, tramadol exposure, particularly abuse and misuse, has increased significantly. A majority of cases are evaluated at a health care facility. This “non-narcotic” opioid is behaving more like a narcotic in this post marketing survey.

205. Pediatric Buprenorphine/Naloxone Poisoning: A Case Series

Acciani J, Kao L.

Buprenorphine/naloxone (Bup/nx) is a newer treatment for opioid addiction. Bup/nx (4 mg/2 mg) has less euphoric effects than other opioids and theoretically less abuse potential. In addition, Bup/nx has a long half life (~37 hours) and has been reported to require large doses of naloxone for reversal of poisoning. We present a case series of three pediatric patients with accidental Bup/nx ingestion.

Case 1: A previously healthy 2 year old 12.7 kg male ingested an unknown amount of his father’s Bup/nx 8mg/2mg tablets. He presented to the ED 30 minutes after ingestion and was found to be awake and alert with normal respiratory effort. One hour after arrival the patient began to develop nausea and a low grade fever. Management consisted of 100% oxygen and iv fluids prior to discharge. The child was subsequently discharged home. Upon presentation at home at 5 hours post ingestion, the naloxone infusion was continued for a total of 33 hours for a total dose of 59mg.

Case 2: A previously healthy 3 year old 21.2 kg male ingested 1 tablet of Bup/nx 2mg/0.5mg. Approximately 30 minutes after ingestion the patient was noted to be drowsy and the next hour following cooperation and a mental status. He was given 2 mg of naloxone with clinical improvement and required an additional 2 mg over the next hour for recurrent symptoms of hypoventilation and drowsiness. He was then started on a naloxone drip for recurrent symptoms of hypoventilation and altered mental status. He was transferred to a tertiary care pediatric hospital for further observation. He did not require any additional naloxone and was discharged 14 hours post ingestion.

Case 3: A previously healthy 14 month old 8.7 kg male ingested an unknown amount of his father’s Bup/nx 8mg/2mg tablets. He presented to the ED 30 minutes after ingestion and was found to be awake and alert with normal respiratory effort. One hour after arrival the patient began to develop nausea and a low grade fever. Management consisted of 100% oxygen and iv fluids prior to discharge. The child was subsequently discharged home. Upon presentation at home at 5 hours post ingestion, the naloxone infusion was continued for a total of 33 hours for a total dose of 59mg.

207. Fatal Metoprolol-Donepzol (Aricept®) Interaction

Caraccio T, McFeen R, Dahm D, McGuigan M, Gupta A, Yun E.

Winthrop University Hospital, Mineola, NY, USA.

Background: Acetylcholinesterase inhibitors (AI) may enhance the effects of Beta-Blockers (BB). We report a patient who presented with severe hypotension, bradycardia, and hypoglycemia after allegedly taking extra doses of donepezil by mistake, along with her regular dose of metoprolol. The patient’s blood pressure readings were in the therapeutic range for donepezil. This is the first case report of a BB, that resulted in her demise. The post mortem blood levels were therapeutic for the BB and above the therapeutic range for donepizol. This is the first report of a BB when administered with an AI as a reversing agent for neuromuscular paralysis.

Case report: A 65 year old minority female patient was admitted to our hospital on October 12, 1997 with a chief complaint of altered mental status. She had been on Prazosin 2 mg tid and metoprolol 25 mg bid for hypertension. She was on Donepezil 10mg/day for dementia. On admission, her vital signs were: T 36.2°, P 80, BP 120/60, RR 12, O2 sat’s 99%, Ht 160 cm, Wt 62 kg. She was lethargic, her speech was slurred and she was disoriented. Her baseline mental status assessment: Orientation: Name, Date, Time, Place; Memory: recent, remote, past; Mood: depressed; Thought processes: incoherent; Cognition: concentration, judgment, insight. Past Medical History: hypertension, diabetes, hyperlipidemia, CHF and CAD. Past Surgical History: percutaneous transluminal coronary angioplasty, heart valve replacement, mitral valve replacement, bilateral cholecystectomy. Social History: non-smoker, non-drinker, 1 sibling, 1 child, no pets. Family History: maternal grandmother: Alzheimer’s disease, maternal grandfather: diabetes. Personal History: mother was told to take 2 TB of doxepin but took 4 TB by mistake. She was then transferred to a tertiary care pediatric hospital for further observation. She did not require any additional naloxone and was discharged 14 hours post ingestion.

208. Survival of Amanita Virosa Poisoning Treated with Plasmapheresis

Mathew DJ,2 Kleeman R.1,2 Thomas J.1,2 Crain FE.1 Chang AS.1,2

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Background: Amanita species are the most lethal mushroom poisoning, with mortality rates ranging from 53% in children below age 10. There is no specific anti-toxin and treatment has historically included supportive therapy, thiotic acid, silibumin, penicillin, N-acetylcysteine and cimetidine. Detoxification techniques, such as plasmapheresis, have been used with variable efficacy. Case report: A 12 month-old male ingested a mushroom from the yard of his home. Six hours later, he developed vomiting and irritability. After a seizure in the emergency department of a local hospital, he was admitted and treated supportively for presumed gastroenteritis. He was transferred to a tertiary care pediatric hospital due to ongoing hypotension. On admission, the patient was receiving fluids at 150 ml/kg/day. There was no history of cardiac function or respiratory insufficiency. Laboratory analysis showed ALT = 11,864 U/L, AST = 15,863 U/L, INR = 7.5 and a serum lactate 28.2 mg/dl. He received cimetidine, high-dose penicillin, N-acetylcysteine and supportive measures while awaiting liver transplant.

Discussion: Amanita virosa is a not a proven therapy for amanita poisoning, however, there are reports in the literature associated with improved outcome. Plasmapheresis is thought to remove protein-bound amanita, toxic metabolites, and immunomodulatory factors. Conclusion: We report a case of survival of Amanita virosa poisoning, with mortality rates ranging from 53% in children below age 10. There is no specific anti-toxin and treatment has historically included supportive therapy, thiotic acid, silibumin, penicillin, N-acetylcysteine and cimetidine.
well, without noted sequelae. Conclusion: Modafinil is an FDA approved medication for daytime sleepiness associated with narcolepsy. This is the first reported case of a child who has developed oral-facial dyskinesia following the ingestion of modafinil.

210. Management of Paediatric Poisoning at a Referral Hospital in Zimbabwe

Gadaga LL, Mufakazi N, Tagwireyi D.

Drug and Toxicology Information Services College of Health Sciences University of Zimbabwe, Harare, Zimbabwe.

Background: Acute poisoning is an important cause of morbidity and mortality in children especially in the developing countries. Despite its significant contribution to childhood injury few studies have been reported from the developing world. In Zimbabwe published work on acute childhood poisoning has focused mainly on the epidemiological trends, with little information on the management of the poisoned patient. Thus limited information is available on the appropriate management of the poisoned child in Zimbabwe and as such there is no baseline data for audit and evaluation of the management.

This paucity of publications necessitated this study on the management of paediatric poisoning in Zimbabwe. Objective: Methods: A retrospective review of case notes for all poisoning admissions of children 15 years old and younger for the period January 2003 to December 2005. Results: A total of 115 cases were reviewed. Distribution of cases according to age was as follows; 0–5yrs (30.4%), 6–11yrs (11.3%) and 12–15yrs (58.3%). The main agents involved in child poisoning were pesticides (51.3%), Pharmaceuticals (61.74%), pulse rate (86.96%), respiratory rate (53.6%) and 0–5yrs (30.4%).

Introduction: The frequency of each complication per recipient of the antitoxin was compared to the frequency of each complication per recipient of the antidote. Results: Of 115 cases reviewed, 33.9% had no complications; 66.1% had complications; 6.1% had severe complications. The most frequent complication was antitoxin allergy (1.7%). Other complications included sepsis, ototoxicity, hypoglycemia, hypokalemia, hypomagnesemia, hypocalcemia and milk fever. Conclusion: This study contributes to the limited information available on the management of childhood poisoning in Zimbabwe.

211. Subacutate Selenium Toxicity from a Nutritional Supplement

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Background: Selenium (Se) is an essential trace element, but can be toxic in larger amounts. In May 2008, US FDA reported 201 individuals with adverse reactions to liquid nutritional supplements containing excess Se and chromium (Cr), distributed by Total Body Essential Nutrition of Atlanta, GA. Objective: To describe the clinical features and estimated total Se ingested by 8 patients with Se toxicity who presented after use of Total Body Formula Peach Nectar liquid supplement. Discussion: The adult Recommended Daily Allowance (RDA) for Se is 55 mcg. Since daily Se intake in the US is ~380 mcg/day, routine Se supplementation is not recommended in the US. Two recent meta-analyses showed inconclusive evidence whether high Se intake from supplements is associated with increased risk of cancer, heart disease, or other chronic diseases. The National Academy of Sciences recommends a safe Se intake of 55 mcg/day, whereas the US RDA is 150 mcg/day for adults. Se is found in foods such as fish, meat, dairy, whole grains, and vegetables. There is no U.S. RDA for Se. Since daily Se intake in the US is ~380 mcg/day, routine Se supplementation is not recommended in the US.

Introduction: This study is the first to report the clinical features and estimated total Se ingested by 8 patients with Se toxicity who presented after use of Total Body Formula Peach Nectar liquid supplement. Discussion: The adult Recommended Daily Allowance (RDA) for Se is 55 mcg. Since daily Se intake in the US is ~380 mcg/day, routine Se supplementation is not recommended in the US.

212. Otoxicity of Prescription Opioids

Hedge MW,1 Smolinko SC,2 Bailey JE,1 Dart RC,1,4 RADARS System Poison Center Group.3

1Wayne State University School Of Medicine, Children’s Hospital of Michigan Regional Poison Control Center, Detroit, MI, USA; 2Wayne State University School of Pharmacy, Children’s Hospital of Michigan Regional Poison Control Center, Detroit, MI, USA; 3Rocky Mountain Poison & Drug Center-Denver Health, Denver, CO, USA; 4University of Colorado School of Medicine, Aurora, CO, USA.

Introduction: Hydrocodone has been reported as a potentially ototoxic drug. The objective of our study was to evaluate the correlation between prescription opioid use and ototoxicity, reported as tinnitus or deafness in poison center cases. Methods: Poison center cases reported to the RADARS System (2003–2006) for fentanyl, hydrocodone, hydroxymorphine, methadone, morphine, oxycodone and tramadol (2006 only) were evaluated for ototoxicity using the codes for deafness or tinnitus. The notes field was also searched for the terms tinnitus, deafness, and hearing loss. Identified cases were excluded if there was a history of an amnolytic, ascorbic acid, aspirin, furosemide, salicylate, quinine, or quinidine. Confirmed non-exposure, animal cases, or charts lacking a 3-digit zip code were also excluded. Data were then normalized by the Unique Recipients of Dispensed Drug (URDD) to evaluate frequency of each complication per recipient of the drug. Results: Reported cases of tinnitus were: fentanyl 2, hydrocodone 57, hydroxymorphine 1, methadone 15, morphine 3, oxycodone 29, tramadol 6. Cases included in the study group; fentanyl 1, hydrocodone 25, hydroxymorphine 1, methadone 9, morphine 2, oxycodone 17, tramadol 2. The reported cases of deafness and/or hearing loss were: fentanyl 7, hydrocodone 10, hydroxymorphine 0, methadone 8, morphine 1, oxycodone 5, tramadol 2. Cases included in the study group were; fentanyl 6, hydrocodone 6, hydroxymorphine 1, methadone 6, morphine 1, oxycodone 3, tramadol 1. Conclusions: The overall rate of opioid-associated ototoxicity reported to poison centers is extremely low. When present, methadone had a significantly higher rate of reported ototoxicity compared to other prescription opioids. Further research is warranted to elucidate factors that impact ototoxicity and opioid use.

213. Use of a “Single Bag” System for Intravenous N-Acetylcysteine at a Children’s Hospital

Trella J, Osterhoudt KC. The Children’s Hospital of Philadelphia, Philadelphia, PA, USA.

Background: Intravenous n-acetylcysteine (NAC) is FDA-approved for acetaminophen (APAP) poisoning as an infusion of three different NAC concentrations for three different time periods. This has led to provider confusion, interruptions in therapy, and complications associated with NAC. An “off-label” single concentration NAC protocol was developed to simplify drug preparation, reduce dosing errors and prevent confusion. Intravenous n-acetylcysteine (NAC) is FDA-approved for acetaminophen (APAP) poisoning as an infusion of three different NAC concentrations for three different time periods. This has led to provider confusion, interruptions in therapy, and complications associated with NAC. An “off-label” single concentration NAC protocol was developed to simplify drug preparation, reduce dosing errors and prevent confusion.

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Results: A total of 115 cases were reviewed. Distribution of cases according to age was as follows; 0–5yrs (30.4%), 6–11yrs (11.3%) and 12–15yrs (58.3%). The main agents involved in child poisoning were pesticides (51.3%), Pharmaceuticals (61.74%), pulse rate (86.96%), respiratory rate (53.6%) and 0–5yrs (30.4%).

Discussion: The adult Recommended Daily Allowance (RDA) for Se is 55 mcg. Since daily Se intake in the US is ~380 mcg/day, routine Se supplementation is not recommended in the US.

213. Use of a “Single Bag” System for Intravenous N-Acetylcysteine at a Children’s Hospital

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214. Agents of Opportunity in the Healthcare Setting

Philip Johnson-Arbor KK,1,2 McKay CA.1,2

Background: Clinical toxicology experts have identified a list of threat agents that could be used to deliberately contaminate healthcare facilities. The aim of this study was to determine which agents available in academic medical centers (AMCs) are of concern as an AO possibly for use in healthcare settings.

Methods: A total of 109 AOs were nominated by survey respondents and reviewed by toxicologists at four AMCs in the eastern United States. The experts agreed to limit the list to those agents that could be acquired and utilized by individuals with low level access to healthcare settings. The final list was reviewed and refined by a subcommittee of the experts.

Results: A total of 70 AOs were identified as agents of concern. The final list consisted of 5 biological, 10 chemical, 22 radiological, 16 pharmaceutical, and 16 radiographic AOs. The list included agents such as biologic toxins, chemical warfare agents, inhalational anesthetics, and toxicological agents.

Conclusion: In conclusion, this is the first report of a list of AOs considered to be of concern for use in healthcare settings. This list can be used to develop threat mitigation scenarios in another subcommittee of the grant.

216. Survival Following Intentional Glyphosate/Surfactant Ingestion Despite the Development of Acute Renal Failure

Nelson J, Marraffi JM, Stork CM, Holland M, Upstate New York Poison Center, Syracuse, NY, USA.

Background: Limited data exists regarding the toxicity and management of glyphosate/surfactant poisoning. We present a case of severe toxicity with recovery.

Case report: A 66 year old schizophrenic patient was admitted to the emergency department with a 3 day history of self-harm and ingestion of Roundup® Concentrate (18-25% glyphosate, surfactant 8-18%) 72 hours prior. Laboratory values on admission showed acute tubular necrosis. Hemodialysis was required for 10 days with improvement in renal function and no electrolyte abnormalities.

Discussion: Those ingestions resulting in severe acute tubular necrosis can be successfully managed with hemodialysis.

217. A New At-Risk Population: Suicide Attempts by Poisons in Patients 40-64 Years of Age

Calello DP,1,2 Chu AF,1 Marcus SM.1,2

Background: Small studies have identified particular at-risk groups for suicide attempts. However, older age is a significant risk factor for suicide attempts in the general population. The purpose of the study was to determine the prevalence and characteristics of suicide attempts in the older age group.

Methods: This is a retrospective study of suicide attempts reported to the New Jersey Poison Information and Education System (NJPIES) from 2000 to 2008. Cases categorized as intentional suspected suicide were included. Demographics and medical information were used to evaluate the patterns of suicide attempts overall and in particular age group.

Results: The overall rate of suicide increased from 36.4 to 50.2 per 100,000 people over the nine-year period with an annual increase of 4.7%. The 40-64 age group ingested the highest dose (MD 261.7 mg), but had a lower rate (MD 166.2 mg). The dose was reported in 45 (mean 71.3 mg). The medical outcome was 68.6% no effect (MD 166.2 mg), 14.3% minor effect (MD 37.5 mg), 14.3% major effect (MD 58.8 mg), and 1.6% mortality (MD 71.3 mg).

Conclusion: The majority of patients in the 40-64 year age group who ingested one or more substances were more likely to have more than two substances ingested, to be evaluated in a healthcare facility (HCF) and to have a more serious outcome. The most common substance class involved was sedative-hypnotics followed by analgesics. Discussion: Suicide attempts in patients from 40-64 years are rising nationwide. We discovered a parallel trend in suicide attempts by poisonning. This age group had the highest rate of suicide attempts in the last nine years and was more likely to have polypharmacy ingestions of prescription drugs, particularly sedative-hypnotics. This largely unrecognized trend requires further attention and surveillance to guide effective treatment and suicide prevention strategies. Further safety and efficacy data may make this protocol available for use (e.g., access, quantity, dispersability), dissemination (i.e. the AO equation), and consequence (e.g. harm, psychosocial impact). The agents were then used to develop threat mitigation scenarios in another subcommittee of the grant.

Results: A total of 109 AOs were nominated by survey respondents and reviewed by toxicologists at four AMCs in the eastern United States. The experts agreed to limit the list to those agents that could be acquired and utilized by individuals with low level access to healthcare settings. The final list was reviewed and refined by a subcommittee of the experts.

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218. Pattern of Adult Carvedilol Ingestions Reported to Poison Control Centers

Forrester MB, Department of State Health Services, Austin, TX, USA.

Background: Carvedilol is a nonselective beta-adrenergic blocking agent indicated for the treatment of mild-severe congestive heart failure. There is limited information about carvedilol ingestion by patients who report to poison control centers. Methods: Cases were all carvedilol ingestions by patients age 20 years or more reported to 6 poison control centers during 2000-2008. Multiple sub-studies of demographic and patients' medical outcomes were conducted with employees from all fields (clinical, patient care, nursing, administration, etc.) at 4 AMCs within one system and interviews were conducted with employees from all fields (clinical, maintenance, engineering, etc.) for the purposes of gaining additional perspectives on the risks and vulnerabilities of current AO systems.

Results: Of a total 70 cases, the dose was reported in 45 (mean 71.3 mg). The medical outcome was 68.6% no effect (MD 166.2 mg), 14.3% minor effect (MD 37.5 mg), 14.3% major effect (MD 58.8 mg), and 1.6% mortality (MD 71.3 mg).

Conclusion: The majority of patients in the 40-64 year age group who ingested one or more substances were more likely to have more than two substances ingested, to be evaluated in a healthcare facility (HCF) and to have a more serious outcome. The most common substance class involved was sedative-hypnotics followed by analgesics. Discussion: Suicide attempts in patients from 40-64 years are rising nationwide. We discovered a parallel trend in suicide attempts by poisonning. This age group had the highest rate of suicide attempts in the last nine years and was more likely to have polypharmacy ingestions of prescription drugs, particularly sedative-hypnotics. This largely unrecognized trend requires further attention and surveillance to guide effective treatment and suicide prevention strategies. Further safety and efficacy data may make this protocol available for use (e.g., access, quantity, dispersability), dissemination (i.e. the AO equation), and consequence (e.g. harm, psychosocial impact). The agents were then used to develop threat mitigation scenarios in another subcommittee of the grant.

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A 31 y.o. Native American girl with lhx of hypothyroidism was found "convulsing" and "dry heaving." At an ED presentation was 17.9 mg/L (range in fatal cases: 6.6–89 mg/L). Though awake and answering questions, she had hypotension refractory to multiple vasopressors. Gastric distension developed with attempted lavage, leading to a bezoar diagnosis. The first to document CT imaging and endoscopy for bezoar, and the first to document CT imaging and endoscopy for bezoar. The patient’s hypotension resolved, and her clinical picture improved temporarily. Unfortunately, she had already suffered severe neurological insult. The family elected to withdraw support, and the patient died 3 days later. The patient presented to an urgent care clinic because of persistent pain and redness. His eye was irrigated with 1 liter of normal saline. On examination, lateral conjunctiva was markedly injected but there was no evidence of corneal abrasion or foreign body. He was prescribed gentamicin ophthalmic solution. Six days post-exposure, the patient described the eye as very red with no pain and no response to the need to prednisolone. The patient’s eye was unchanged. Fourteen days post-exposure, examination revealed a superficial corneal lesion and conjunctival injection. Tobramycin was dexamethasone ophthalmic solution was prescribed. The eyes were examined 4 weeks the bright red color in his eye gradually improved. Six weeks after the initial exposure the redness had mostly resolved. The patient never experienced any changes in visual acuity.Discussion: Coral venoms have many different toxic properties. Some have hemolytic and antimicrobial activity. Some have been shown to be toxic to fish. Others cause tissue necrosis in competing species of coral. Because of the severity and extended duration of conjunctivitis and the lack of any significant abrasion, it is possible that the corneal symptomatology may have been caused rather than caused by a mechanical injury. Conclusion: We report a case of prolonged conjunctivitis after exposure to a fragment of live coral. Symptoms slowly resolved after treatment with antibiotic and steroid ophthalmic drops.
symptoms to death. In general, systemic effects are considered uncommon. Nephritic syndrome has been previously reported in association with mercury intoxication but is usually seen with chronic mercury exposure.

We present a case of minimal change disease associated with injection of elemental mercury. Case report: A 34-year-old male, with a history of schizophrenia and polysubstance abuse presented to the ED with complaints of lower extremity edema, abdominal distention, and increasing shortness of breath over the previous four days. He reported self-injection with elemental mercury which he collected from an old broken thermometer and had stored three years before this presentation with unclear origin. Baseline laboratory values during the initial admission showed normal renal function, electrolytes, glucose, acid-base balance, and urine analysis. Two days after admission, the patient’s total urine Hg concentration was 3007.6 mcg/L, the whole blood Hg concentration was 203.7 mcg/L, and the urine Hg/creatinine ratio was 1205 mcg Hg/g Cr. At this time, the patient was found to have a urine protein concentration of 3134 mcg/dL, a serum protein concentration of 2.9 g/dL, and a serum creatinine concentration of 1.1 mg/dL. His kidney biopsy was consistent with minimal change disease. The patient was treated by surgical excision of a mercury deposit in his antecubital fossa. He was initially started on prednisone to help his edema but was later switched to diuretics for the long-term management of the disease. The patient was monitored for toxicity and any adverse effects that may improve recognition and tracking of ADR. Conclusion: Monitoring of NPD for ADR may offer a new avenue of untapped information and allow for improved post marketing surveillance.

26. Afrin Gargle; A Novel & Dangerous Method To Control Pharyngeal Bleeding

Hurley WT, Lynn A.

Washington Poison Center, Seattle, WA, USA.

Background: Oxymetazoline is an imidazoline vasoconstrictor commonly found in topical decongestants such as Afrin®. Imidazolines cause central and peripheral alpha-2 stimulant effects, producing a clinical syndrome similar to clonidine. Overdose or intoxication from ingestion or excessive mucosal application of oxymetazoline has resulted in altered mental status, miosis, diaphoresis, hypotension, bradycardia, and respiratory depression. Case description: A 15-year-old male was admitted to the Intensive Care Unit after developing altered mental status, vomiting, and bradycardia. He presented to the Emergency Department (ED) with pharyngeal bleeding 8 days after an uncomplicated tonsillectomy. While in the ED, he was given a dose of benzodiazepine and oral glucose gel. The patient was noted to be restless but with normal vital signs. On further events in the ED and remembers waking in the ICU about 12 hours later. ED and ICU records indicate the patient developed bradycardia (pulse 20-30), altered mental status, respiratory depression, and eventual apnea. He was not intubated, but required 36 hours of ICU care before resolution of bradycardia and somnolence. He was evaluated by a Pediatric Cardiologist who could not detect a cardiac cause. The patient’s mother, a registered nurse, became suspicious after researching the side effects of Afrin® and called the Poison Center. Interviews with ED staff confirmed his symptoms began immediately after gargling with iced Afrin®.

The medical director of the ED reported the idea came from one of the Otolaryngologists. A Pub Med search of Afrin®, oxymetazoline, imidazoline, and gargle produced no similar cases. A Google search provided a single hit describing the procedure in postoperative instructions from an Ear, Nose, and Throat clinic in Frisco, Texas. Inadequate serum was available to test for oxymetazoline, although its presence was confirmed by thin layer chromatography and mass spectrometry. The case demonstrates a novel, but potentially dangerous method of controlling pharyngeal bleeding with Afrin® and the vasoconstrictor oxymetazoline. This practice should be discouraged.

27. Using a Broadcast Fax To Notify Health Care Facilities about Trends in Poisoning

Von Dera K.

Washington Poison Center, Seattle, WA, USA.

Background: In an attempt to alert our state’s health care facilities (HCF) about trends in poisoning, our poison center utilized our computer fax machine’s broadcast fax capabilities. The broadcast fax allows us to send a single fax to a ‘group’ in this case all Washington state emergency departments. Method: A one page alert summarizing the information was delivered directly to emergency department fax machines. The fax included: (1) a current list of all currently monitored drugs, (2) a reminder to call the poison center for assistance, the availability of a toxicologist for consultation, and encouraged them to call for any exposure or questions. An email address was also provided it they wished to contact us via email as well. Results: Although we had no calls regarding potential poisonings related to the trends addressed in the alerts, we did note an increase of 0.91% in HCF call volume during a time period when our overall call volume decreased by 0.66%. The alerts appear to be well received by the health care facilities and call center staff reported positive verbal comments made during routine fax calls. Conclusion: Our center found this was a low maintenance, inexpensive, and effective way to keep health care facilities updated on current trends in poisonings. An added bonus was increased poison center utilization. Further monitoring of the process will be necessary to determine if this increase in HCF call volume is significant and will continue.

28. Palytoxin Poisoning Following Dermal Contact with Zoanthid Coral

Northeastern SP,1 Wu J,1 Cantrell FL,2 Clark RF.1

1University of California, San Diego and VA, San Diego, CA, USA.

2University of California, San Diego, San Diego, CA, USA.

Background: Palytoxin is most commonly reported after ingestion of seafood. We report the first case of palytoxin poisoning from dermal absorption with local toxicity from zoanthid coral in a patient with intact skin. Case: A 25-year-old female handled a zoanthid coral without any barrier protection from home aquarium with plan to replicate coral. After handling she noted metallic taste and perioral paresthesia followed by hives and lip edema. Patient presented to emergency department with hand edema, erythema and pruritus. Vital signs: 138bpm, 145/101, 02 sat 97%. Ortopharynx was clear, urethra not noted on bilateral upper arms, thighs, abdomen, upper chest, and back without evidence of infection or abraded skin. Patient handled same coral previously without event but was not familiar with palytoxin. On discharge it was treated as hypersensitivity reaction with diphenhydramine, methylprednisolone, and lorazepam 1mg with improvement of symptoms. Vital signs normalized and discharge was advised. Discharged home on diphenhydramine and diphenhydramine. Conclusion: Palytoxin poisoning is most common after ingestion of seafood. We present the first case of dermal absorption from intact skin following palytoxin from a zoanthid coral resulting in neurologic and dermal effects.

29. Automation and the Hazard of Human Error Results in Unexpected Toxicity during Routine Blood Donation

DeHart LM, Darelle HE.

University of Texas, Health Science Center, San Antonio, San Antonio, TX, USA.

Background: An automated donation process has improved the efficiency of blood donation. The effect of the human aspect on this technology resulted in the inadvertent transfusion to a blood recipient of a saline infusion instead of its intended use for intravenous use. Case: Paramedics were called to transport a 61 year old plasma donor who was inadvertently transfused with 4 g of sodium citrate in 250 ml of saline that was labeled as not intended for intravenous use. On the scene, EMS observed the patient having over 6 PCV’s per minute. On arrival to the ED, the patient presented with facial flushing, hypertension, tachycardia, blurred vision, dizziness, generalized numbness, nausea, and headache. Initial ED vital signs: BP 177/106, HR 102, RR 20. SpO2 97%. The patient had no significant past medical history. He was given two doses of oral lormetrex 10 mg and two doses of intravenous hydralazine 5 mg IV to control his hypertension. Brain computed tomography revealed normal brain scan. Serial ionized calcium levels were monitored. At 24 hour period with no indication of hypocalcemia. On discharge, the patient complained of a mild headache, but all other symptoms resolved. Discussion: The patient was monitored for toxicity and any adverse effects that may result from infusion of a product not intended for intravenous use. An individual’s repetitive routine and utilization of automatic devices that incorporate a variety of safety functions that include pumps, sensors, and alarms give a false sense of security. The automated donation process is designed to increase efficiency in the harvesting of blood products and to decrease the potential adverse effects to the donor. Conclusion: The potential for human error is always present. In this case, an infusion of a medication that was not intended for intravenous use resulted in unexpected toxicity.
230. Collaboration between a Poisons Center (PC) and Occupational Safety and Health Administration (OSHA)
Spiller HA,1,2 Griffler J.1
1Kentucky Regional Poison Center, Louisville, KY, USA; 2Central Ohio Poison Center, Columbus, OH, USA.
Background: OSHA relies heavily on voluntary reporting to identify sites for inspection for potential unsafe workplace conditions. PC receive calls from both the public and healthcare professionals concerning workplace exposures, with more than 48,000 workplace exposures (1.95% of all human exposures) annually. A percentage of these calls may reflect cases of unsafe working conditions responsible for the worker injury. We sought to evaluate the outcome of a collaboration between one PC and state OSHA. Method: The poison center reported to state OSHA office all cases of workplace exposure that involved a workplace related toxin and more than a trivial exposure. The PC identified the workplace location to allow identification of the site for possible direct inspection by OSHA. After evaluating the reports OSHA determined if an inspection was warranted and reported back to the PC the outcome of the inspection. Results: The PC provided OSHA with 86 reports of workplace exposure; 42 dermal, 30 inhalation, 15 ingestion, and 21 other. Route of exposure was: ocular 44, dermal 42, inhalation 30, ingestion 15, other 21. Moderate 27, minor 53, no effect 5 and not applicable 2. Discussion: This patient is the youngest to have loperamide-induced coma, respiratory depression, and ileus reversed with naloxone. Loperamide can cause a life threatening side effect profile in overdose at a 2-week-old infant. Naloxone can be used as an effective reversal agent in the case of a loperamide overdose at this young age.

232. The Toxic Trio: Valproic Acid, Lithium & Carbamazepine
Karydes HC,1 Meehan TJ,2 Bryant SM.1,2
1Cook County-Stroger Hospital Department of Emergency Medicine, Chicago, IL, USA; 2Toxikon Consortium, Chicago, IL, USA.
Background: Patients with altered mental status and seizure or psychiatric disease often present with an unclear medication history. Commonly prescribed medications include valproic acid (VPA), lithium (Li), or carbamazepine (CZP) of which our regional poison center (RPC) often recommends obtaining these serum concentrations without a known history of ingestion may help direct care. Methods: Cases from our RPC coded as VPA, Li, and CZP, from January 1, 2006 to December 31, 2008, were reviewed. Ingestion n = 30, ingestions with supratherapeutic concentration (VPA >100 mcg/mL, Li >1.2 mcg/L, CZP >12 mg/mL) were evaluated for the following criteria: 1) those with altered mental status, and an unclear history of seizure or psychiatric disorder and 2) a medication profile not including VPA, Li, or CZP. Results: Twenty-six patients met the inclusion criteria: 8 patients in the Li group (1.9-5.2 mcg/mL, mean 2.9), 9 patients in the CZP group (13.4-38.8 mcg/mL; mean 23.2) and 9 patients in the VPA group (113-247 mcg/mL; mean 158). All patients survived and were treated with supportive care; however, one patient had a Li level of 5.2 mcg/L and received hemodialysis. Discussion: In altered patients potentially being treated for seizure or psychiatric disorders and unknown ingestions or medication lists, obtaining concentrations of VPA, Li, and CZP may help direct care and provide clinically relevant information. Conclusions: Our RPC detected twenty-six patients with supratherapeutic VPA, Li, or CZP concentrations in patients with potential indications for the agent, but no available history of drug ingested or medication list. A prospective study is warranted to evaluate the usefulness of obtaining these concentrations in this patient population.

233. The Spice of Life: A 12-Year Review of Nutmeg Exposures
Carstars SD,1 Cantrell FL.2
1University of California, San Diego, San Diego, CA, USA; 2California Poison Control System, San Diego, CA, USA.
Introduction: Nutmeg is widely used as a household spice. There are a number of citations in the medical literature of its abuse as a psychoactive agent, primarily for its purported hallucinogenic effects; these reports are primarily limited to case reports. Methods: We performed a retrospective review of the California Poison Control System database for all cases of single-substance human exposure to nutmeg for the time period 1997-2008. Data collected included age, gender, route of exposure, whether exposure was intentional, clinical effects, duration of effects, treatment, and medical outcome. Results: A total of 119 patients were identified, ranging in age from 1-96 years with a mean of 22 years. Results are shown in the Table. Most commonly reported effects were tachycardia (n = 24), vomiting (n = 22), agitation (n = 16), hallucinations (n = 15), dizziness (n = 12), abdominal pain (n = 9), and nausea (n = 6). Therapies administered included activated charcoal (n = 5), benzodiazepines (n = 4), antiemetics (n = 4), IV fluids (n = 3), and gastric lavage (n = 1). Conclusion: In this case series, most cases of nutmeg exposure were associated with minor or moderate clinical effects, with tachycardia, CNS

Abstracts

Distribution of nutmeg exposures

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<th>SEX</th>
<th>Intentional (%)</th>
<th>Unintentional (%)</th>
<th>Total (%)</th>
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<tr>
<td>Male</td>
<td>67 (77.9)</td>
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<td>15 (45.5)</td>
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AGE (years)

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Unknown

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<tr>
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<tr>
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<td>0 (0.0)</td>
</tr>
<tr>
<td>Ocular</td>
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</tr>
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</table>

TREATMENT SITE

| Home | 33 (38.4) |
| Doctor’s office | 22 (66.7) |
| Refer to ED | 9 (10.5) |
| ED | 39 (45.3) |
| Inpatient (non-ICU) | 1 (1.2) |
| VAPC | 4 (4.7) |

OUTCOME

| None | 10 (11.6) |
| Minor | 43 (50.0) |
| Moderate | 20 (23.1) |
| Major | 0 (0.0) |
| Death | 0 (0.0) |

Unable to follow (potentially toxic exposure) | 13 (15.1) |

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234. Creation of a Secure Web Service To Visualize Poison Center Data for Nationwide Biomedical Surveillance

R. Bronstein AC,1 Rhodes MB,2 Tokars JI,2 Savell T,2 Stinn JF,2* American Association of Poison Control Centers, Alexandria, VA, USA; 1Bionet, LLC, use of Ethanol and Prevention, Atlanta, GA, USA; 2Bearingpoint, Inc, Atlanta, GA, USA; 3Ciber, Inc, McLean, VA, USA.

Background: BioSense is an automated, real-time bio-surveillance system for disease monitoring and response. Currently, data are received and maintained in a central warehouse, pre-processed to map chief complaints and diagnoses, and analyzed using time series charts, line listings, and maps. Problems with this centralized model include a loss of source control over the data, duplication of effort, difficulty keeping data current, and the need for centralized mass storage. BioSense is evolving to a federated model, based on secure web services, to optimizing the use of data while minimizing data stewardship issues. The National Poison Data System (NPDS) serves as a data repository for all 61 poison centers but does not yet have a secure web service enabling streaming of data while securing and maintaining third party information, thus providing the ability to disseminate and analyze important data without the responsibility of maintaining a database.

Methods: We developed a browser-based interface (Quicksilver) for visualizing NPDS data not previously available as a modified-release formulation which provides stable blood levels for up to 24 hours. It does not cross the blood-brain barrier. The drug peaks at 4-8 hours. Tamsulosin has the highest affinity for the a1a-receptor among the drugs in this class. Due to the absence of a1a-receptors in blood vessels and the drug’s high selectivity for a1a-receptors, it has been hypothesized that a therapeutic dose would be less likely to cause adverse effects in adults. Although this has not been confirmed, tamsulosin is associated with a very low risk of orthostatic hypotension in therapeutic doses of 0.4 mg and 0.8 mg once daily. A pediatric study (age range 5-16 years) evaluated tamsulosin for the treatment of dysfunctional voiding and its effect on systemic blood pressure. The initial dose was 0.2 mg followed by an increase to 0.4 mg. During a 10-month treatment period, there were no reports of dizzy- ness, nausea, or rhinitis. We recommend that clinicians avoid this type of caller can delay the delivery of services to the public and potentially increase the burden on the system. Open-ended question staff interviews determined that all calls originated from pay phones in the same city. The primary reason that this caller chose to call the PC during 2008 was to provoke a reaction and its behavioral impact on PC services.

Results: In 2008 we received 961 calls from Caller X. SPIs identified fifteen phone numbers associated with Caller X. We analyzed one year of call data from our database to determine the frequency of calls received from Caller X. All Specialists in Poison Information (SPIs) were interviewed to measure the overall impact of repeated calls and how these calls may affect the quality of care provided to callers. Our regional PC receives a significant number of calls from a particular individual who is easily identified by characteristic speech patterns and disconnected treatments. The purpose of this study is to identify the frequency and impact of nuisance calls on our regional PC and to determine the relationship of these calls to the caller’s subjective behaviors.

Discussion: The organic acid 5-oxoproline (5-OXP) has been reported to induce an anion gap (AG) metabolic acidosis following acute APAP overdose and describe the analytical meth- ods utilized to detect the 5-OXP. This method is a simple and rapid method for visualizing NPDS data not previously available as a modified-release formulation which provides stable blood levels for up to 24 hours. It does not cross the blood-brain barrier. The drug peaks at 4-8 hours. Tamsulosin has the highest affinity for the a1a-receptor among the drugs in this class. Due to the absence of a1a-receptors in blood vessels and the drug’s high selectivity for a1a-receptors, it has been hypothesized that a therapeutic dose would be less likely to cause adverse effects in adults. Although this has not been confirmed, tamsulosin is associated with a very low risk of orthostatic hypotension in therapeutic doses of 0.4 mg and 0.8 mg once daily. A pediatric study (age range 5-16 years) evaluated tamsulosin for the treatment of dysfunctional voiding and its effect on systemic blood pressure. The initial dose was 0.2 mg followed by an increase to 0.4 mg. During a 10-month treatment period, there were no reports of dizzy- ness, nausea, or rhinitis. We recommend that clinicians avoid this type of caller can delay the delivery of services to the public and potentially increase the burden on the system. Open-ended question staff interviews determined that all calls originated from pay phones in the same city. The primary reason that this caller chose to call the PC during 2008 was to provoke a reaction and its behavioral impact on PC services.

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Discussion: The organic acid 5-oxoproline (5-OXP) has been reported to induce an anion gap (AG) metabolic acidosis following acute APAP overdose and describe the analytical meth- ods utilized to detect the 5-OXP. This method is a simple and rapid
239. **Poison Specialists with a Sub-Specialty: Managing Lead Poisoning 2007–2008**

Bottei EM, Current C, Noble T.

**Iowa Statewide Poison Control Center, Sioux City, IA, USA.**

**Problem:** Health care professionals caring for lead-poisoned children frequently call our poison center asking about their patients’ histories. At any one time, our poison center is following 12 to 18 pediatric patients with lead poisoning. Without a structure for managing these ongoing cases, health care professionals were receiving a heterogeneous group of recommendations from all of the specialists at our center. **Solution:** In 2007, we created a formal program with which to follow these lead-poisoned children. Two CSPIs staff this lead program and underwent in-depth training on all aspects of lead-poising, signs and symptoms, pretreatment of lab tests; chelation; side effects of chelators; environmental, dietary and public health interventions; developmental assessment; and contact information the child’s lead-poisoning Preventing Program. Guidelines for chelation, medication side effects and non-medical interventions were created for the CSPIs to use, which but also can be faxed to the health care professionals. The two CSPIs perform all outreach, follow up phone calls and act as the points of contact for the physicians and nurses who call into the poison center with questions or follow up. If a new case of lead poisoning is called into the poison center when neither CSPI is on duty, the specialist on duty gives recommendations, based on the guidelines, and refers the case to the medical director for quality control. **Results:** During 2007–2008, we contacted about 178 persons with lead exposures and has managed forty children with persistently elevated BLLs. Of these 40 children, 9 have undergone 17 rounds of oral chelation. This program has led us to decrease in morbidity or mortality from poisoning. **Conclusion:** PID does not support the offer a public health benefit of reduced morbidity or reduced healthcare costs.

240. **Pill Identification: Comparison of Two Poison Centers (PC) **

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1Kentucky Regional Poison Center, Louisville, IN, USA; 2Central Ohio Poison Center, Columbus, OH, USA.

**Background:** Use of PC for identification of pills has exclusively related to increased requests for PID. The average daily dose of buprenorphine/naloxone was 11.7 mg (range: 4–26). One patient (1.6% ADE) with asthma and pneumonia, had a hypoxic episode while on buprenorphine/naloxone and was treated with steroids and examinations. All patients were referred to the public and professional poison-related advice. Poison Specialists with a Sub-Specialty: Managing Lead Poisoning 2007–2008

**Method:** Use of PC for identification of pills has increased significantly in last five years posing an increasing burden on PC resources. Identification of pills (PID) by imprint code for callers without an exposure is not a core service of poison centers. We evaluated the impact of PID on two PCs, one which did PID for the public (PC1) and one which did not (PC2). Pills continued to be identified in both centers for health and police callers. **Method:** evaluation of all calls to two PC from 2001–2008. **Results:** 241. **Seventy Years of High Dose Insulin Therapy for Calcium Channel Antagonist Poisoning**

Bryant SM,1,2 Espinoza TR,1 Aks SE.1,2

Cook County-Stroger Hospital: Department of Emergency Medicine, Chicago, IL, USA; 2Toxikon Consortium, Chicago, IL, USA.

**Background:** Our regional poison center (RPC) promotes the use of hyperventilation/euglycemia (HIE) therapy in severe calcium channel antagonist (CCA) poisoning. The objective of this study is to report 7 years of experience recommending HIE therapy. **Methods:** Utilizing our RPC data from January 1, 2002 through December 31, 2008, all cases of CCA poisonings receiving HIE were searched. Primary endpoints were number of HIE cases per year & outcome, in addition to total CCA deaths each year. Secondary endpoints (if available) included dose of insulin, time of initiation (TOI) & duration of HIE, ages, [glucose], & lowest systolic blood pressure (SBP) recorded. **Results:** Forty-six cases of CCA poisoning were managed with HIE over 7 years. Data revealing cases managed, deaths with HIE, & total CCA deaths (+/- HIE) are represented (table). All patients received standard antitodal therapy (SAT = IVF, calcium salts, glucagon, & pressors). HIE administration followed our RPC recommendations: ie. 1) insulin dosing = bolus 0.5 U/kg - 1.0 U/kg followed by hourly drip at same dose & 2) TOI of HIE was either preceding or shortly after addition of pressors, 19 (41%). Only 4 CCA deaths occurred (21% - 2 deaths with 1 death occurring even though correct HIE dosing was initiated prior to SAT (0.05%). Means (age, highest glucose measured, & lowest SBP measured) were 51 years, 282 mg/dL, & 74 mmHg respectively. Severe medical outcome (Mod, Maj, death) (+/- HIE) are represented (table). All patients admitted to our adolescent detox service from 2007–2008. **Results:** 86 charts were reviewed and 61 patients met inclusion into the study. There were 33 males and 28 females who were between the ages of 14-21 (Mean: 17.7) years old. The average length of stay in the hospital was 2.8 days (range: 1–7). All patients had resolution of their withdrawal symptoms with buprenorphine/naloxone. The average daily dose of buprenorphine/naloxone was 11.7 mg (range: 4–26). One patient (1.6% ADE) with asthma and pneumonia, had a hypoxic episode while on buprenorphine/naloxone and was treated with steroids and examinations. All patients were referred to the public and professional poison-related advice. Poison Specialists with a Sub-Specialty: Managing Lead Poisoning 2007–2008

242. **A Novel Approach to the Treatment of Opiate Addiction in Adolescents**

Jolliff HA,1 Casavant MJ,1,2 Teesel RN,2 Rogers PD.1

1Ohio State University, Columbus, OH, USA; 2Ohio State University, Columbus, OH, USA.

**Background:** Adolescent addiction to heroin and other opiates is a growing problem in our region. Buprenorphine/naloxone (Suboxone®) has been used successfully to treat opiate addiction and withdrawal in the outpatient setting. We describe a novel approach to the treatment of adolescents who are addicted to opiates, using buprenorphine/naloxone in the inpatient hospital setting. **Methods:** A retrospective chart review of all patients admitted to our adolescent detox service from 2007–2008. **Results:** 86 charts were reviewed and 61 patients met inclusion into the study. There were 33 males and 28 females who were between the ages of 14-21 (Mean: 17.7) years old. The average length of stay in the hospital was 2.8 days (range: 1–7). All patients had resolution of their withdrawal symptoms with buprenorphine/naloxone. The average daily dose of buprenorphine/naloxone was 11.7 mg (range: 4–26). One patient (1.6% ADE) with asthma and pneumonia, had a hypoxic episode while on buprenorphine/naloxone and was treated with steroids and examinations. All patients were referred to the public and professional poison-related advice. Poison Specialists with a Sub-Specialty: Managing Lead Poisoning 2007–2008

243. **Lead Pellet in the Pericardium**

Mamantov TM,1 Cironne C,2 Olson KR.1

1California Poison Control System: San Francisco Division, San Francisco, CA, USA; 2Children’s Hospital of Oakland, Oakland, CA, USA.

**Background:** We report a case of a lead pellet in the pericardium resulting in a benign outcome. Lead toxicity from a foreign body lodged in an acinic joint space has been documented previously. No previous case reports are available regarding a lead pellet lodged in the pericardium where lead levels were documented as a possible concern of toxicity. **Case report:** 14 year old male suffered a gunshot wound to the chest. Chest xray revealed one lead pellet lodged in the pericardium. Troponin was elevated to 0.37. Patient had normal blood pressure and pulse rate. Echocardiogram revealed no pericardial effusion or myocardial injury. The pellet appeared to migrate within the pericardium and was removed via pericardial window. The patient was discharged from the hospital in stable condition. **Discussion:** The surgical consultants deemed the pellet was not causing a lead overload. The lead pellet was not causing any harm to the patient. The patient was discharged from the hospital in stable condition. **Conclusion:** Buprenorphine/naloxone is safe and effective at treating adolescent patients with opiate addiction in the inpatient setting.
244. Toxicity Following Massive Acute Paliperidone Ingestion

Lynch MJ, Akhtar J, Protell PH, Krasowski MD, Katz KD. University of Pittsburgh Medical Center, Pittsburgh, PA, USA.

Background: Paliperidone, 9-hydroxyrisperidone (Invega), PA, USA.

Discussion: We report the first case of acute paliperidone overdose with levels. Case report: A 24-year-old woman reportedly took 270 mg of paliperidone. She presented to the Emergency Department 12 hours later with ataxia, chest pain and “fogginess.” Her heart rate was 168 beats per minute and blood pressure was 138/82mmHg. EKG showed sinus tachycardia with a HR of 138, QRS complex delay and low voltage. The patient was admitted to the Toxicology Treatment Center. She was somnolent, but arousable 14 hours after ingestion with dysarthria, ataxia and lightheadedness. Serum ethanol, acetaminophen and salicylate were undetectable; urine drug screen by GC/MS was positive only for diazepam. Diazepam level was 0.45mcg/ml(0.2-2). Serial paliperidone levels were obtained by HPLC/Tandem Mass Spectroscopy(LC-MS/MS). Paliperidone levels at 16, 32, 51, and 76 hours were 1200(4-16.5), 830, 270, and 73ng/ml, respectively. The patient had increased somnolence over the next 36 hours, but remained arousable. Heart rate ranged from 90’s to 160’s with movement. Episodes of activity-related tachycardia in the 140-160’s continued for 72 hours post-ingestion. Serial EKGs showed sinus tachycardia and QTc intervals of 502, 537, and 477 on days 1, 2 and 3, respectively. She improved with supportive care and IV hydration alone. Upon resolution of toxicity, she was transferred to a psychiatric facility. Discussion: This is the first reported case of toxicity following paliperidone overdose. The patient demonstrated prolonged somnolence, orthostatic tachycardia and QTc prolongation with toxicity parameters. The patient was treated with IV fluids and monitoring with IV fluids, and close monitoring with treatment of cardiac arrhythmias.

245. Demographics of Poison Center Educators

Banach GP, Livernese LW. Upstate NY Poison Center, SUNY Upstate Medical University, Syracuse, NY, USA.

Background: This study reflects the most current and comprehensive data on the demographics of poison center educators using an on-line survey tool. Objective: To provide an overview of characteristics of poison center educators through descriptive research. Methods: Eighty-eight poison center (pc) educators were invited by e-mail to participate in a confidential, on-line 30 question survey designed to help define the characteristics, functions, roles and tasks of poison center public educators. Results: A total of sixty-eight public educators (78%) responded. Of these, 54% (n = 36) worked 20-36 hours a week. 77% (n = 52) of respondents worked 40 hours weekly as a public educator. A vast majority, 68% (46) responded they worked 0-10 hours a week. Respondents’ responsibilities distributions include conducting:

- Presentations for the general public, n = 61 (90%)
- Presentations for healthcare professionals, n = 48 (71%)
- Train-the-trainer program, n = 37 (54%)
- NAC loading dose of 18 grams, phase II of 6 grams (100mg/kg) of NAC. We elected to treat him with a NAC loading dose of 27 grams, phase II of 6 grams over 4 hours, and phase III of 12 grams over 16 hours. Even with a safety margin built into his total dose of 8 grams of NAPQI. If we dosed this patient using the normal protocol for IV NAC dosing, he would have received a loading dose of 27 grams (150mg/kg), phase II of 9 grams (50mg/kg) and phase III of 18 grams (100mg/kg) of NAC. We elected to treat him with a NAC loading dose of 18 grams, phase II of 6 grams over 4 hours, and phase III of 12 grams over 16 hours. Even with a safety margin built into his total dose of 8 grams of NAPQI. If we dosed this patient using the normal protocol for IV NAC dosing, he would have received a loading dose of 27 grams (150mg/kg), phase II of 9 grams (50mg/kg) and phase III of 18 grams (100mg/kg) of NAC. We elected to treat him with a NAC loading dose of 18 grams, phase II of 6 grams over 4 hours, and phase III of 12 grams over 16 hours. Even with a safety margin built into his total dose of 8 grams of NAPQI. If we dosed this patient using the normal protocol for IV NAC dosing, he would have received a loading dose of 27 grams (150mg/kg), phase II of 9 grams (50mg/kg) and phase III of 18 grams (100mg/kg) of NAC. We elected to treat him with a NAC loading dose of 18 grams, phase II of 6 grams over 4 hours, and phase III of 12 grams over 16 hours. Even with a safety margin built into his total dose of 8 grams of NAPQI. If we dosed this patient using the normal protocol for IV NAC dosing, he would have received a loading dose of 27 grams (150mg/kg), phase II of 9 grams (50mg/kg) and phase III of 18 grams (100mg/kg) of NAC. We elected to treat him with a NAC loading dose of 18 grams, phase II of 6 grams over 4 hours, and phase III of 12 grams over 16 hours. Even with a safety margin built into his total dose of 8 grams of NAPQI. If we dosed this patient using the normal protocol for IV NAC dosing, he would have received a loading dose of 27 grams (150mg/kg), phase II of 9 grams (50mg/kg) and phase III of 18 grams (100mg/kg) of NAC. We elected to treat him with a NAC loading dose of 18 grams, phase II of 6 grams over 4 hours, and phase III of 12 grams over 16 hours. Even with a safety margin built into his total dose of 8 grams of NAPQI. If we dosed this patient using the normal protocol for IV NAC dosing, he would have received a loading dose of 27 grams (150mg/kg), phase II of 9 grams (50mg/kg) and phase III of 18 grams (100mg/kg) of NAC. We elected to treat him with a NAC loading dose of 18 grams, phase II of 6 grams over 4 hours, and phase III of 12 grams over 16 hours. Even with a safety margin built into his total dose of 8 grams of NAPQI. If we dosed this patient using the normal protocol for IV NAC dosing, he would have received a loading dose of 27 grams (150mg/kg), phase II of 9 grams (50mg/kg) and phase III of 18 grams (100mg/kg) of NAC. We elected to treat him with a NAC loading dose of 18 grams, phase II of 6 grams over 4 hours, and phase III of 12 grams over 16 hours. Even with a safety margin built into his total dose of 8 grams of NAPQI.
is one the most widely used learning project worldwide. The results show how high are the learning needs and expectations in medical toxicology and suggest the opportunity for disseminating e-learning projects in Europe and North America. References 1. Manfrini R, Martin L, Deligant C, Dri P. Feasibility of a web-based continued medical education program in dermatology: The DermoFAD experience in Italy. Dermatology 2006;213:6–11.

249. Seven Years of Cyanide Ingestions in the U.S. – Critically Ill Patients Are Common, but Antidote Use Is Not
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1Welfare Hall Medical Center, San Antonio, TX, USA; 2Central Texas Poison Center, Temple, TX, USA.

Background: Cyanide is potent, easily obtainable, and requires antidotal therapy. Insufficient literature has been published on the incidence of CN ingestions and the resultant outcomes. Previous reports have not described the incidence of antidotal use or CN-induced cardiac arrest. Objective To describe the incidence of CN ingestions reported, therapies and symptoms recorded, and antidotal therapy used, as reported to all poison centers over 7 years.

Methods: Our study was a retrospective cohort of all CN exposures (2000–2006) in the U.S. as reported to the National Poison Database (NPDS). We included only acute CN ingestions. We collected the following variables: intent of use, management site, medical outcomes, antidote use, therapies used, and clinical effects. The data abstractor was trained prior to collection and serial meetings were performed. We used a standard data collection form. 10% of a random chart selection were reviewed by a 2nd abstractor blinded to patient outcome and a kappa value was calculated. Our data was completed prior to FDA approval of hydroxocobalamin. Results: 435 out of 1741 cases were acute ingestions. 68% were male, 13% were children. The intent for 45% of cases was intentional, misuse, or suicidal. Sodium thiosulfate (ST), sodium nitrite (SN), or both were reported to have been used in 13% (57/435) of cases. Eight and a half percent (36/435) of cases died. 31/36 deaths were intentional. 25/36 deaths were reported following ST or SN or both. Cardiac arrest or hypotension were reported in 10% (42/435) of cases. 33/37 (90%) cardiac arrest cases died. 68% of patients with cardiac arrest or hypotension received antidotal therapy. 46/193 (24%) treated at health care facility had cardiac arrest, respiratory arrest, hypotension, or coma. Kappa value was 0.8 (0.72–1.0). For outcomes and antidotal use. Conclusions: CN-induced cardiac arrest or hypotension is common; however, CN antidotal therapy use is not. Research aimed at improving CN-induced hypotension and cardiac arrest is needed. Additional research on reducing barriers to antidotal use is also needed. This study did not evaluate hydroxocobalamin.

250. Familial Lead Poisoning Including Two Cases of Neural Lead Poisoning
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Index Case
A 2 year old boy was found on routine screening to have a venous blood lead level (BLL) of 59 mcg/dL. A course of DMSA was attempted, but because of difficulty in administering the DMSA, a parenteral course of BAL and EDTA was administered. His post chelation BLL was 21 mcg/dL.

Mother: Second Pregnancy In screening the rest of the family, the index case’s mother, a 21 year old woman who was 34 weeks pregnant, was found to have a blood lead level of 124 mcg/dL. She was completely asymptomatic (no GI or neurological complaints or symptoms) except for a hemoglobin of 8.7 gm/dL, ZPP 1391 mcg/dL and FPP 203 mcg/dL. She received a five day course of EDTA plus DMSA. Her post chelation BLL was 55.4 mcg/dL.

Second Child
A 7 pound 11 ounce girl was delivered at 38 weeks of gestation. She had AFGARs of 8 and 9 and a normal neurological exam. The initial BLL was 107 mcg/dL, and she received a double volume exchange transfusion. Her post-exchange BLL was 9 mcg/dL and rose to 57 mcg/dL by day 2 post-exchange. She was administered a 5 day course of BAL and EDTA. Her post-chelation BLL was 35 mcg/dL. The child has since undergone 3 courses of parenteral and 2 courses of oral chelation therapy. Developmental assessment at 9 months of age was unremarkable.

Mother: Third Pregnancy
Approximately one year after the birth of her second child, the mother was approximately 19 weeks pregnant when she was brought to our attention. Her BLL at that time was 42 mcg/dL. Her BLL eventually rose to 70.8 mcg/dL in the third trimester and she underwent chelation with DMSA. Her post chelation BLL was 13.4 mcg/dL.

Third Child
A 7 pound 14 ounce boy was born at 39 weeks of gestation and had a normal neurological exam. His initial BLL was 105 mcg/dL, and received a double volume exchange transfusion. His post-exchange BLL was 13 mcg/dL and it rose to 45 mcg/dL by day 3 post-exchange. He was started on BAL and EDTA and completed a standard 5 day course. The child’s post chelation BLL was 26 mcg/dL. The child has had no further chelation. The mother’s elevated BLL was the result of eating a cat-shaped piggy bank. These cases add to the scant literature further information on the management and clinical course of neonatal lead poisoning.

251. A Case Report of Fatal IV Elemental Mercury Poisoning
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1West Texas Regional Poison Center, El Paso, TX, USA; 2Texas Tech University HSC El Paso, El Paso, TX, USA.

Objective: To report a fatal case of IV exposure to elemental mercury (Hg) and summarize reports from the literature of similar exposure. Methods: Case Summary: A 36 y/o previously healthy male presented to the emergency department with a 10 day history of sore throat, fever, cough, headache, arthralgia, diarrhea, insomnia, agitation, and a rash. The patient worked as a welder in a scrap metal recovery business. Exam showed a fine maculopapular rash on his chest and back, fever, diaphoresis, and anxiety. An abnormal CXR resulted in a CT of the chest and a 2-D-Echocardiogram that revealed massive embolization of radio-opaque material in the pulmonary arterial system and the right heart. Initial Hg levels were 244mcg/L in blood and 552mcg/L in his urine. Succimer (DMSA) was initiated. After initiating succimer treatment, symptoms became worse with N/V, increased agitation, emotional lability, weakness of extremeties, generalized numbness, and blurred vision. The patient refused further treatment. He continued to worsen clinically and developed evidence of hepatic and renal injury (elevated transaminase levels, proteinuria). Acetylcysteine was initiated IV. Cardiology was consulted prior to removal of elemental Hg from the heart, Sodium 2,3-dimercapto-1-propanesulfonate (DMPS) was obtained and started by IV dosing. Pressors and continuous venous hemodialysis (CVVHD) were initiated. The patient’s mental status continued to deteriorate, his blood pressure became progressively more difficult to maintain. He developed respiratory distress, renal failure and was intubated. His admission day 21 of mutiorgan failure. His peak blood Hg level were 1268mcg/L. At autopsy, elemental Hg was noted in his ventricles, lungs, and major vessels. Discussion: Literature review of previous cases of IV elemental Hg toxicity presented for various reasons including suicidal intent, presumed anabolic properties, enhanced sexual prowess, and Folk Remedies. Most cases were relatively asymptomatic or with chronic manifestations. Fatalities, such as in our case, were rare. Conclusion: DMPS may hold promise in treating severe IV elemental Hg poisonings. Evidence for the cardiovascular use of CVVHD should be considered in these cases.

252. Redotex Revisited – Intentional Overdose with an Illegal Weight Loss Product
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1California Poison Control System- San Diego, San Diego, CA, USA; 2UCSD Medical Center, San Diego, CA, USA.

Background: Redotex is dietary weight loss supplement not available in the United States. It contains multiple ingredients: d-norpseudoephedrine 50 mg, aloin 16 mg, atropine .36 mg, dexamyl .8 mg and triiodothyronine (T3) 0.075 mg. The US Food and Drug Administration issued warnings in 1987 about the dangers of this medication, although a review of the medical literature failed to reveal any reports of Redotex intoxications. We report a case of acute toxicity secondary to a Redotex overdose. Case report: A 17 y/o previously healthy female arrived at an ED 1 hour after reportedly ingesting 30 Redotex tablets that she pur chased in Mexico. Initial examination and vital signs were unremarkable. She received one dose of activated charcoal. Two hours later, remarkable clinical and laboratory findings were: BP 138/78 mm/Hg, HR 120 bpm and sinus tachycardia (110–120 bpm) for 3 days. No other complications. Final hospitalization was 5 days. No interventions were required. Labs on day 2 revealed a T 3 level >12 and TSH .03 (.4 – .7). The patient was discharged on day 3 and additional follow-up
up is not available. Discussion: Redoxet continues to be used by US citizens as evident by our patient as well as multiple chat groups on the internet. While difficult to buy directly in the US the product is readily purchased in Mexico. Our patient’s initial effects could be attributed to the sympathomimetic activity of d-norpseudophedrine, while her sustained sinus tachycardia could be attributed to T10,11. Large ingestions of Redoxet can result in clinically significant symptoms. Additional efforts may be warranted to limit access to this potentially dangerous medication.

253. Increased Anion Gap From Sodium Thiosulfate Administration in a Dialysis-Dependent Pediatric Patient: Case Report and Literature Review

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1Massachusetts/Rhode Island Poison Control Center, Providence, RI, USA; 2Children’s Hospital Boston, Boston, MA, USA.

Introduction: Sodium thiosulfate (STS) is an increasingly popular option for the treatment of calciphylaxis, a syndrome of vascular calcification, thrombosis and skin necrosis seen in patients with end-stage renal disease on hemodialysis. Calciphylaxis often results in non-healing wounds and is usually fatal. We report a case of widened anion gap in a patient receiving STS therapy for calciphylaxis. Case report: Our poison center received a call regarding a 52-year-old hemodialysis dependent patient. The anion gap was 31 and the bicarbonate level measured 21 mEq/L. Four days prior to STS administration the normal and her bicarbonate level measured between 26-29 mEq/L. At the time that the patient started on an intravenous sodium thiosulfate regimen. She received 5 grams STS on 2 consecutive days followed by 4 grams STS for 5 consecutive days. Her lactate level measured 0.6 mEq/L. Onset of increased anion gap (AG) coincided with the initiation of STS therapy. Sodium thiosulfate was discontinued upon poison center recommendation and on the day after stopping the therapy, the AG was 16. The anion gap continued stay in the normal range for the rest of her hospital course. Discussion: Since 2004, STS has been advocated as an effective therapy for treatment of calciphylaxis, otherwise known as calcific uremic arteriopathy. Cases previously reported in the literature have described high anion gaps of 26.1 and 26.7 respectively in patients during STS therapy for calciphylaxis. In animals, acidosis, elevated serum phosphorus, and then falls to a low in February (3%). Exposures 41% (n = 7,681 BWS exposures were reported in 48 US states. The number of exposures peaks in September (13%) and then falls to a low in February (3%). Exposures were more common in the South (33%) and West (64%) than in the Midwest (2%) or Northeast (0.7%). 41% (n = 3,149) were female and most patients were between 20 and 50 years of age (57%, n = 4,374). The majority of cases (63%, n = 4,849) were not managed in a health care facility. Follow-up information was available for 49% (n = 3,963) of reported cases. While the majority of patients were classified with minor clinical effects (Table 1) (30%) with moderate effects and 38 cases with major effects (0.5%). Moderate or major outcomes were more common in the South than in other regions (p < 0.001). Antivenom use did not vary by region (p = 0.5). Conclusions: BWS exposures are regional and vary over the course of the year. Most effects are minor. Few exposed patients receive antivenom, including those with moderate or major effects. Cases reported to poison centers may differ in severity and treatment from non-reported cases.

256. Adenosine Mediated Cardiovascular Toxicity in Amitriptyline Poisoning Rats

Kalkan S, Hoegaertel N, Oransay K, Buyukdeligoz M, Tuncay O.
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Background: This study was designed to determine whether amitriptyline could enhance plasma adenosine levels or to examine adenosine-mediated cardiovascular toxic mechanisms-induced by amitriptyline. Methods: Rats (n = 24) were randomized into three groups. First group (control) received 5 % dextrose i.p 1 hour before amitriptyline infusion (0.94 mg/kg/min for 60 minutes). Other rats pretreated 1 hour prior to experimental protocol with EHNA (10 mg/kg, i.p, an inhibitor of adenosine deaminase) and NBFI (1mg/kg i.p, an inhibitor of facilitated adenosine transport) to increase adenosine availability. After EHNA/NBFI administration, one group of rats received 5% 5 % dextrose i.p group infused with amitriptyline. MAP, HR and ECG were recorded. Plasma adenosine concentrations were measured by HPLC. Data were evaluated by Student’s t test (paired data) and Kaplan-Meier procedure. Results: In the control group, amitriptyline infusion caused an inhibition in MAP, HR and prolongation in QT, QRS duration (p < 0.05). In EHNA and NBFI administered rats, amitriptyline infusion caused a reduction in MAP at 20min (p < 0.05) and prolongation QRS duration at 10., 20., and 40.min when compared to control group (p < 0.05). When we look into the changes in SAP and HR of control and EHNA/NBFI administered groups, the reductions in MAP (p < 0.01, after 20.min) and HR of the amitriptyline administered groups were more significantly than the dextrose administered group (p = 0.05, p < 0.0001, p < 0.001, at 20., 40., 50., 60. min). In EHNA/NBFI administered groups, amitriptyline-induced QT (at 10.min, p < 0.05) and QRS prolongation (p < 0.01, p < 0.01, p < 0.001, p < 0.001, p < 0.01, after 10.min) were more significant than the dextrose-induced QT and QRS prolongation. In control group, plasma adenosine concentrations did not show any significant change after amitriptyline. In the other groups, plasma adenosine concentrations showed a significant increase (p < 0.05). Conclusions: These results indicate that amitriptyline does not alter directly plasma adenosine concentration but endogenous adenosine levels contribute amitriptyline-induced cardio-vascular toxicity.


Goodroad SD,1 Givens ML,1 Borys DJ,2
1Rocky Mountain Poison and Drug Center-Denver Health, Denver, CO, USA; 2University of Colorado Denver School of Medicine, Aurora, CO, USA.

Background: Black Widow spiders (Latrodectus spp., 1904–2006). Method: Descriptive statistics were used to present the age, gender, time of year, census region, outcome, and use of antivenom. Proportions were compared with Chi-squared, Fisher’s exact and the Wilcoxon rank-sum tests. Results: A total of 79,749 BWS exposures were reported to US Poison Centers. Methods: All exposures with the generic code for BWS envenomation reported to the American Association of Poison Control Centers between 2004 and 2006 were reviewed. Conclusions: The temporal association mechanisms-induced by amitriptyline.

1Banner Good Samaritan Medical Center, Phoenix, AZ, USA; 2Children’s Hospital Boston, Boston, MA, USA; 3CrystalRun Healthcare, Middletown, NY, USA.

Introduction: Sodium thiosulfate (STS) is an increasingly popular option for the treatment of calciphylaxis, a syndrome of vascular calcification, thrombosis and skin necrosis seen in patients with end-stage renal disease on hemodialysis. Calciphylaxis is a syndrome of vascular calcification, thrombosis and skin necrosis seen in patients with end-stage renal disease. Calciphylaxis causes chronic skin necrosis and may result in clinically significant symptoms. Additional efforts may be warranted to limit access to this potentially dangerous medication.

Kalamullah EA,1 Leikin JB.2
1Toxikon Consortium, Chicago, IL, USA; 2NorthShore Univ. HealthSystem, OMEGA, Glenview, IL, USA.

Background: The typical clinical course following oral PG ingestion remains uncertain. Deliberate oral PG overdose is rare, with very few published cases. We present a case with the 2nd highest level following PO exposure. Case report: A 31 y/o female was admitted to the ED after self administered oral PG ingestion at 8 mg/kg (27.5% PG) along with wine for Christmas. She was found by her husband and initially had an AP 81 and BP 100/50, Hgb 12.1, Hct 38.5, and a serum PG level of 470 mg/dL. The patient was given a single 15 mg/kg dose of fomepizole for possible ethylene glycol (EG) exposure while waiting for PG levels to be drawn. The patient was transferred to a liver intensive care unit (LICU) for a PG chelation cocktail. She required a total of 14 liters of Ringer’s lactate over 24 hours. The daily Lactate level was documented at 26.5 mmol/L. The patient was kept NPO and treated with continuous kidney support for 36 hours. Her hospitalization was complicated by the development of a deep vein thrombosis, hypotension, and acute pancreatitis. She was treated with enoxaparin sodium and a combination of vasopressors and diuretics. After a 5-day hospitalization, the patient was transferred to a rehabilitation facility. The serum PG level at the time of discharge was 6 mg/dL.

Conclusion: A PG level of 470 mg/dL after acute ingestion is the highest previously reported. This case indicates that oral PG ingestion is rare. To our knowledge, this is the 2nd highest PG level due to PO exposure. Our patient’s clinical course was nondescript beyond a mildly elevated lactate, suggesting previous gastrointestinal absorption or decomposition. We were unable to find evidence in the literature of PG chelation therapy. We highlight the importance of reporting high PG ingestions in order to better understand clinical toxicology.
improved to 58 and her SBP improved and remained greater than 70 mmHg. Electrolytes were unable to be measured for the next 8 hours secondary to lipemia. The remainder of her ICU stay was complicated by acute pancreatitis, liver enzyme elevation and oliguric renal failure. Pressors were weaned and she was extubated on day 4. The patient was alert, oriented and neurologically intact at the time of transfer to inpatient psychiatry on day 14. The patient continued on hemodialysis for persistent renal failure. Discussion: This patient with severe CCA poisoning remained hypotensive after aggressive pharmacologic and fluid resuscitation. Lipid rescue was initiated shortly after initiation of lipitor therapy. Adverse effects from the lipid therapy included acute pancreatitis and inability to measure electrolytes due to interference with lab testing for lipitor. The patient's mental status and renal function improved with lab testing. Conclusion: Our patient, who was able to swallow and produced adequate urine, was successfully treated with lipid rescue and was successfully weaned off pressors.

264. Appalling WA State Poisoning Mortality Trends from 1981 to 2005
Martin TG,1,2 Sullivan S.2
1University of Washington, Seattle, WA, USA; 2Washington Poison Center, Seattle, WA, USA.
Introduction: The goal of Healthy People 2010 is a poiso-
nation mortality rate (/100,000) of 1.8. Purpose: Deter-
dine poisoning trends in WA in injury mortality from 1981 to 2005. Methods: A retrospective mortality study using Wonder.CDC.Gov leading and under-
lying cause of death data, which is coded from 1981 to 1998 with ICD9 and from 1999 to 2005 with ICD10. Results: Overall 25% of deaths from 1981 to 2005 were classification of the gas-phase of lacquer thinner, methanol was

265. Poison Center Data Identifies Increase in Energy Drink Consumption and Teens as At-Risk Group
Hernández RA, Villareal CL, Fernández MC.
University of Texas Health Science Center San Antonio, San Antonio, TX, USA.
Background: Specialists in Poison Information noted an increase in calls regarding energy drink consumption which prompted a statewide database search of Texas regional poison centers (PCs). Since 1985, the popularity of energy drinks has brought with them the idea of increasing mental alertness. The average caffeine content in a soft drink contains ~27 mg/serving whereas the typical energy drink contains ~80 mg/serving. This study aims to identify the at-risk population for neg-
itive health effects, risk factors, and medical conse-
quences linked with energy drink consumption.

266. “First Fridays” in the Emergency Depart-
ment: Chronobiological Implications
Meehan TJ,1 Prendergast HM.2
1Toucon Consortium, Chicago, IL, USA; 2University of Illinois - Chicago, Department of Emergency Medicine, Chicago, IL, USA.
Background: In the ED, many chronobiological anec-
dotes exist. For example, belief in the power of the full
moon to increase ED volume is frequently cited by ED
staff. Another belief is that on the “First Friday” of every
month, the volume of substance abuse ED visits increases. This observation derives from the fact that public aid payments are dispersed on this day and the
belief that recipients use their funding to obtain illicit
drugs and alcohol. Several studies have been able to link drug use/abuse and socioeconomic disparity; but
the ED “First Friday” effect has not been able to give conflicting results. We sought to determine if the “First Friday” effect truly exists, and to deter-
mine if ED staffing levels need to be adjusted on
First Fridays. Patients were compared to patients
seen on all other weekend days. Our hospital is an
academic teaching hospital with over 50,000 annual
patient visits situated in an urban environment, and
all analyses were completed utilizing the SAS
system. Results: Overall, 192 total days were ana-
lyzed for ED visits related to substance use/abuse/over-
dose. Of these, 48 days were assigned to the “First Friday” designation. For all weekend days, there was a 2.9 patient/day visit rate attributable to substance use/abuse. On First Friday weekends, this rate increased to 3.2. However, Poisson analysis failed

267. Permanent Vision Loss after Occupational Methanol Inhalation
Young AC,1 Wax PM,1 Kleinschmidt KC.1
1University of Texas Southwestern Medical Center at Dallas, Dallas, TX, USA; 2UT Southwestern, Dallas, TX, USA.
Introduction: Patients who inhale methanol-containing products can have visual impairment. Prior cases with visual impairment had partial to full recovery. We report the first case of methanol vapor exposure from occupational use with both gap acidosis and permanent vision loss. Case: 43-year old car painter presented with 2 days of bilateral blurred vision that progressed to visual loss, vomiting, & hyperventilation. He denied PMH or meds. He had replaced his usual cleaning sol-
vent 1-week prior to the start of his symptoms with a cheaper alternative containing 10% - 30% methanol. Between paint applications, he poured the methanol-containing solvent into a spray gun & cleaned it by spraying this solvent in his poorly ventilated garage without a mask. Paint use tripled during the week prior to presentation due to increased business. He denied intentional abuse. On presentation, vitals signs and physical exam were unremarkable except mild respira-
tory distress & bilateral, 5 mm nonreactive pupils with-
out light reflex. Laboratory workup was negative except for a sodium bicarbonate infusion. At our facility, we contin-
ued this plus flose & steroids. Hemodialysis (HD) was done with a repeat methanol of 7 mg/dL. His light per-
ceptual visual acuity improved slightly but had not returned to complete vision loss. Repeat methanol & formic acid levels were 0 after second HD. Ophthalmology noted bilateral optic nerve sheath edema with methanol tox-
icity. Initial & 5-month follow-up visual acuity were negative. Discussion: Carburetor cleaners & lacquer thinners are commonly abused for intoxication; target-
ing the main component toluene. However, in an analy-

268. An In Vitro Study To Determine the Ability of Albumin and Plasma To Scavenge Organophosphate Compounds
Priyadarshini MJ, Ramachandran A, Oommen A.
Christian Medical College and Hospital, Vellore Town, Tamil Nadu, India.
Background: Organophosphates are known as a common method of suicide in the developing world. Treatment with oximes is controversial and might bene-
fit only patients poisoned by specific organophosphates or moderate poisoning. New treatments such as the use of fresh frozen plasma or albumin to scavenge organo-
phosphates have been suggested, and the aim of this study was to determine in vitro if components of fresh frozen plasma, especially albumin, bind organophos-
phate compounds and thus help in scavenging these compounds in poisoned patients. Study design and methods: The ability of albumin and components of plasma to bind organophosphates was studied by incu-
bating membrane filtrates (16 g%) with various concentra-
tions of monocrotophos (0–600 μM). To evaluate scaveng-
ing by plasma components, plasma or albumin free plasma (albumin removed by affinity to Cibacron-Blue Sepharose affinity chromatography) and monocrotophos inhibited pure butyrylcholinesterase 90% and binding to albumin (16 g%) was saturated at that concentration of organophosphate. Incubation of
plasma or albumin-free plasma with 200μM monocrotophos inhibited pure butyrylcholinesterase 67% and 58% respectively, indicating the presence of free monocrotophos uncomplexed to albumin. 

Conclusions: Monocrotophos binds to albumin and also components in albumin-free plasma. However, the low saturation binding of monocrotophos to albumin suggest that neither albumin nor plasma would be biologically effective in scavenging organophosphates in poisoned patients. This is because concentrations of circulating organophosphates in poisoned patients are in the range 2μg/ml in the first two days of poisoning.

269. Clinical Effects and Outcomes Following Unintentional Ingestion of Citalopram (Celaex®) by Young Children

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1 Central Texas Poison Center, Temple, TX, USA; 2Texas AM University Health Sciences Center, Temple TX, USA; 3Scott & White Hospital, Temple, TX, USA.

Background: Citalopram (Celaex®) is a selective serotonin reuptake inhibitor (SSRI) approved by the FDA in 1998 for major depression and general anxiety disorders in adults. Off-label uses include treatment for fibromyalgia and diabetic neuropathy pain control and treatment for some forms of urinary incontinence. There are no large reviews of the clinical effects seen in children following a single unintentional citalopram ingestion. Objective: To determine the clinical effects of ingestion of citalopram by children under the age of seven years.

Methods: This was a retrospective, observational study of telephone calls to one state’s poison centers from 2000 to 2008. Inclusion criteria were single agent ingestions of citalopram by patients ages six years and younger. Results: There were 222 children ranging in age from the 186 (83.8%) children who had ingested amount recorded, the amount ranged from less than 5 mg to 200 mg. The 185 (83.3%) children who had no symptoms ingested an average of 2.9 mg/kg (range 0.06 to 18.3 mg/kg). The 35 children who had no symptoms ingested an average of 2 mg/kg (range 0.6 to 18.3 mg/kg).

Discussion: The data indicate that in general, citalopram appears to have no to mild clinical effects (99.1%; 95% CI: 0.9 to 0.99). Citalopram was generally well tolerated in this small group of children. However, a small number of children (2.3%) ingested more than 10 mg/kg and 1 (0.4%) ingested more than 20 mg/kg. Conclusion: For children under the age of seven years, single agent ingestions of citalopram by patients ages six years and younger usually have no or mild clinical effects (99.1%; 95% CI: 0.9 to 0.99). A pediatrician immediate medical attention should be advised when ingestions greater than 10 mg/kg are reported.

270. Ibuprofen Ingestion with Delayed Coma, Respiratory Failure, Hypotension and Metabolic Acidosis

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Ibuprofen (IB) poisoning has been reported to cause several symptoms within four hours of ingestion. We present a case of IB ingestion with severe symptoms 9 hours after ingestion. A 43-year-old female with history of hypothyroidism presented to the ED 45 minutes after ingesting 159 IB 600 mg tablets. The EMS run sheet documented that the patient was awake and alert and had HR 62, BP 90/70, and RR 16. Initial vital signs included: HR 59, BP 113/74, and RR 16. She had no abnormal physical findings but had pointed ideation and auditory hallucinations, which she and her husband confirmed had been present for the past 6 months. Initial BMP: 140/39/101/29/101/15/103, undetectable ASA and APAP, ECG with NSR, negative UDS, TSH-0.03. The patient was given synthroid 200 mg tablets. The EMS run sheet documented that the patient woke enough to state he ingested the entire bottle in a suicide attempt. His mental status deteriorated again and he was intubated on hospital arrival. An EKG review indicated 3 uncorrected ST elevations in leads V1-V3 with coved type appearance suggestive of Brugada pattern. A troponin I was elevated at 0.13 ng/ml (normal range 0.00-0.09). Emergent coronary angiogram done with suspicion of acute coronary syndrome revealed only mild coronary artery disease without significant lesions. A comprehensive urine drug screen, including liquid chromatography, was negative except for tramadol and its metabolites. A serum tramadol level returned markedly elevated at 8663 ng/ml (therapeutic values 100–150). Serial EKGs showed gradual resolution of the acute ST elevations. The patient was extubated on hospital day 2 and discharged on hospital day 3. Discussion: A review of the literature reveals no human cases of tramadol overdose causing EKG changes consistent with Brugada pattern. In vitro blockade of sodium-channels with tramadol has been demonstrated at high concentrations. Sodium-channel block is an established way of uncovering Brugada pattern. In our case, the massive concentration of tramadol caused this patient’s Brugada pattern. Conclusion: Tramadol overdose may cause EKG changes consistent with Brugada pattern. To our knowledge, we report the first case of Brugada pattern with tramadol overdose.

271. Thrombocytosis Induced by Rosuvastatin

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Background: Adverse hematologic effects associated with statins include thrombocytopenia and hypersensitivity reactions. We report a case of thrombocytosis following rosvastatin use. Case report: A 50-year-old African American male nonsmoker with a PMH of hypertension, pulmonary embolism, gout, diabetes mellitus, peripheral neuropathy, and dyslipidemia presented to the Emergency Department with left knee pain. His medications included simvastatin 40mg qday, atenolol 25mg qday, amlodipine 10mg qday, warfarin 5mg qday, metformin 1000mg tid, and hydrocodone-acetaminophen 5/250mg q6h. Cell blood count prior to this change was 48000/μl, 45% neutrophils, 1% lymphocytes, 30% monocytes, 20% eosinophils, and 11% basophils. He had no adverse sequelae from the event and moved on to hospital day 2 and discharged on hospital day 3. Discussion: Thrombocytosis appears to bind to albumin and also components in albumin-free plasma. The 185 (83.3%) children who had no symptoms ingested an average of 2.9 mg/kg (range 0.06 to 18.3 mg/kg). The 35 children who had no symptoms ingested an average of 2 mg/kg (range 0.6 to 18.3 mg/kg).

Discussion: The data indicate that in general, citalopram appears to have no to mild clinical effects (99.1%; 95% CI: 0.9 to 0.99). Citalopram was generally well tolerated in this small group of children. However, a small number of children (2.3%) ingested more than 10 mg/kg and 1 (0.4%) ingested more than 20 mg/kg. Conclusion: For children under the age of seven years, single agent ingestions of citalopram by patients ages six years and younger usually have no or mild clinical effects (99.1%; 95% CI: 0.9 to 0.99). A pediatrician immediate medical attention should be advised when ingestions greater than 10 mg/kg are reported.

272. Isolated Tramadol Overdose Associated with Brugada Pattern EKG Changes

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Background: Tramadol is a commonly prescribed analgesic with weak μ-receptor agonist activity as well as serotonin and norepinephrine re-uptake inhibition. Toxicity usually manifests as seizures and the usual manifestations of opioid overdose. In humans, EKG changes associated with tramadol overdose have been described with some synthetic opioid agonists but not with tramadol. We report a case of isolated tramadol overdose with EKG changes consistent with Brugada pattern, likely caused by sodium-channel blockade. Case report: A 47 year old man with a history of depression was found by his roommate unresponsive with an empty bottle of tramadol. The bottle had contained sixty 50 mg tablets. 4 mg of IV naloxone was given by EMS, after which the patient woke up and was intubated on hospital arrival. An EKG showed right bundle branch block. He had no adverse sequelae from the event and moved on to hospital day 2 and discharged on hospital day 3. Discussion: A review of the literature reveals no human cases of tramadol overdose causing EKG changes consistent with Brugada pattern. In vitro blockade of sodium-channels with tramadol has been demonstrated at high concentrations. Sodium-channel block is an established way of uncovering Brugada pattern. In our case, the massive concentration of tramadol caused this patient’s Brugada pattern. Conclusion: Tramadol overdose may cause EKG changes consistent with Brugada pattern. To our knowledge, we report the first case of Brugada pattern with tramadol overdose.

273. Youngest Reported Case of Serotonin Syndrome from Ingestion of Sertraline Alone

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Background: Serotonin Syndrome (SS) is a well known complication of treatment with Selective Serotonin Reuptake Inhibitors (SSRI), particularly in the presence of other serotonergic substances. Symptoms including autonomic instability, neuromuscular dysfunction, and mental status changes typically resolve quickly and completely after discontinuation of the offending medications. We present the case of an 8 month old girl pre-sented to an ED 3 hours after ingesting as much as 700 mg (approximately 83 mg/kg) sertraline. She was “jittery” and vomiting with BP 105/65 mmHg, HR 150 bpm, RR 28 rpm, rectal Temp 37.9°C. On exam, she was inconsiderable, tremulous, and had moist oral mucosa. She had normal tone and reflexes in her arms, but rigidity and 4+ reflexes in her legs with sustained clonus at the ankles. Pupils were dilated and reactive. Labs revealed: WBC 18000/mm3, normal electrolytes, BUN 15 mg/dL, Creatinine 0.3 mg/dL, total CK 203 U/L and undetectable acetaminophen, salicylate and ethanol. Urine drug screen by GC/MS was positive only for a large amount of sertraline. Serum sertraline level 16 hours after ingestion was 600 ng/ml (therapeutic doses <200). She received IV hydration and frequent doses of lorazepam. Approximately 40 hours after ingestion, her vital signs normalized, but she had continued hyper-reflexia and clonus in her legs. Since she was tolerating feedings and all laboratory results normalized, she was discharged home 48 hours after her ingestion. However, she was reported to have been asymptomatic at home and had no further ingestions. We were not able to elucidate the mechanism of thrombocytosis. Conclusion: Rosuvastatin may cause thrombocytosis by an unclear etiology. Further research is warranted to investigate the mechanism.
case. Conclusion: From a review of the English literature, this appears to be the youngest reported case of SS. Clinicians should consider drug toxicity in infants. Administration of 3) clinical care is warranted, as the symptoms may persist longer than is typically reported in older patients.

274. Conflict of Interest (COI) Management among Pharmacy and Therapeutics (P&T) Committees

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1New York University School of Medicine, New York, NY, USA; 2Albany Medical Center, Albany, NY, USA.

Background: P&T committees are responsible for selecting medication to include on the hospital formulary. These decisions should ideally be guided by patient and institution centered factors. We sought to determine the mechanisms by which conflicts of interest are defined and institution centered factors. We sought to determine which factors are common. We report a unique error due to lookalike medication error.

Methods: The mechanisms by which conflicts of interest are defined are common. We report a unique error due to lookalike medication error.

Results: An anonymous survey was conducted on all members of the pharmacists, 303 (55%) agreed to complete the questionnaire, 68 (22.5%) completed the survey. Most respondents (59%, only 12 (3.5%) had an actual conflict of interest, the greatest percentage of respondents (76%) had a potential conflict of interest. Conclusion: The majority of respondents reported having a potential conflict of interest. This highlights the need for education on how to accurately identify and manage conflicts of interest.

275. Unique Lookalike Medication Error Leads to Patient Harm

Farmer BM, Hoffman RS, Nelson LS.
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Objective: Errors related to lookalike medications are common. We report a unique error due to lookalike pre-filled syringes (PFS) of morphine and diazepam.

Methods: A 50 year old man with severe alcohol withdrawal was receiving symptom triggered therapy. He initially required escalating doses of IV diazepam, totaling 280mg over 3–4 hours without adequate control of withdrawal. His most recent dose was 100mg IV diazepam, one hour earlier, was well tolerated. At this time an additional 100mg IV diazepam and 65mg IV phenobarbital, both as bolus doses, were ordered. The diazepam was administered first, followed immediately by the phenobarbital. Within 5 minutes he became unresponsive with respiratory depression, pinpoint pupils, and rapid oxygen desaturation. He was intubated and placed on mechanical ventilation, after which his saturation normalized. The patient’s condition was initially attributed to the simultaneous administration of multiple sedatives. However, at nursing turnover, review of the unit’s “narcotic” cabinet revealed that 100mg of morphine (PFS 10 x 10 mg) was unaccountable and an unanticipated 100mg of diazepam (10 PFS x 10 mg) was present. The patient’s hospitalization was complicated by a protracted ICU stay due to pneumonia and sinuses. Discussion: This case represents a sentinel lookalike medication error. The boxes of PFS for morphine and diazepam have similar physical characteristics, lettering, and are the same size and dose (10mg). One contributory factor was that the morphine box was placed within the stack of diazepam boxes in the cabinet. Discussion with the nurse suggested that he was likely in an “automode” and did not carefully examine the medication label. A checklist completed by the provider or reading the label aloud would have prevented this. The PFS should be labeled in different colors and font. They should be physically separated in storage areas.

276. Ethiopian Mountain Viper Strikes in the Texas Hill Country

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Background: An Ethiopian Mountain Viper (Family; Viperidae, Genus: Bitis, Species; Parivucalia), a virtually unknown snake which inhabits the forests and grasslands of the Ethiopian Rift Valley, envenomated a patient in the Texas Hill Country. Case: A 67 year old man was nicked by the snake on his left index finger causing profuse bleeding from the wound site. He arrived in the Emergency Department within 45 minutes of envenomation. The patient presented with a Blanching hand without capillary refill, later developing grayish black blisters and ophryopharyngeal swelling. Vital signs on admission: blood pressure = 150/90, pulse = 109, and oxygen saturation 98%. The patient developed respiratory distress within 10 minutes of arrival as the oxygen saturations dropped to 71%; he was medicated, intubated and placed on a ventilator. The herpetologist had informed the staff that no antivenin existed but that he thought the Gaboon antivenom might work. The poison center was consulted: after numerous calls to different agencies, the Gaboon antivenom was located. Discussion: The crisis was compounded by the lack of information: According to the herpetologist there are only 7 known Ethiopian Mountain vipers in existence, no known anti-venem for the species. Discussion: The antivenom is not commonly available and should be physically separated in storage areas.

277. Tracking Melamine Exposure Calls via the National Poison Data System

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1Centers for Disease Control and Prevention, Atlanta, GA, USA; 2American Association of Poison Center, Atlanta, VA; 3American Association of Poison Control Centers, Alexandria, VA, USA.

Background: In late 2008, over 300,000 infants were exposed to high amounts of melamine (a known cause of renal stone) in infant formula monitored in China. This resulted in 50,000 hospital admissions and 6 deaths in China. Scientists from the American Association of Poison Control Centers (AAPCC) and the Centers for Disease Control and Prevention (CDC) were asked by the United States Food and Drug Administration to monitor the National Poison Data System (NPDS) for calls related to possible melamine exposure among infants. Case presentation: Between Sept 29 to Oct 10, 2008 to identify melamine-associated calls. We then applied the following case definition to each of the melamine exposure calls to identify potential cases of melamine toxicity: any person < 3 years of age and one of the following: 1) living abroad in China within one month of the call; 2) drinking a product that was confirmed to be contaminated by melamine; or 3) drug toxicity of melamine exposure. Results: 384,810 calls were captured by NPDS during the timeframe; 44 were melamine-associated calls from 14 states. Twenty-nine (65.9%) calls came from individuals, 13 (25%) came from healthcare facilities, and 4 (9.1%) were unknown. Call volume peaked on Oct 2 (n = 14) and gradually declined. Most exposures (31%) had no symptoms of toxicity. Three calls had length of stay, one patient was placed on mechanical ventilation and one on renal replacement therapy. Call volume rebounded from 14 states. Twenty-nine (65.9%) calls came from individuals, 13 (25%) came from healthcare facilities, and 4 (9.1%) were unknown. Call volume peaked on Oct 2 (n = 14) and gradually declined. Most exposures (31%) had no symptoms of toxicity. Three calls had length of stay, one patient was placed on mechanical ventilation and one on renal replacement therapy. Call volume rebounded from 14 states. Twenty-nine (65.9%) calls came from individuals, 13 (25%) came from healthcare facilities, and 4 (9.1%) were unknown. Call volume peaked on Oct 2 (n = 14) and gradually declined. Most exposures (31%) had no symptoms of toxicity. Three calls had length of stay, one patient was placed on mechanical ventilation and one on renal replacement therapy.
poison exposure callers would hear a busy signal because all lines were tied up, often with drug identification calls. A decision was made to discontinue drug ID services to the public. We were responding to over 55,000 ID requests per year at that time. With the time savings realized, efforts were re-directed at efforts to increase the number of human exposure calls followed by a known outcome. Since discontinuation of ID calls we have been able to increase the number of callers by 47% to over 90. We feel that an additional encounter related to a call give us an extra opportunity to interact with the caller, providing additional management advice when appropriate, educate where needed, and provide a second opinion to the caller, and improve the quality of the data we collect by being able to code a known outcome on a greater percentage of cases. Conclusion: Poison Centers should carefully evaluate the potential benefit derived from providing drug identification services to the general public. Scarce resources may well be utilized in other areas.

280. Iatrogenic Intralipid Overdose in a Case of Amlodipine Poisoning
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Introduction: Intralipid is a rescue therapy that has been used successfully in overdoses. We present a case of massive iatrogenic intralipid overdose during the treatment of amloidipine toxicity. Case report: A 71 yo F c h/o hypertension ingested 27 amloidipin 5mg 2 hours prior to evaluation. Her initial vital signs were a BP 85/44 mmHg, HR 79 bnp. She was alert and asymptomatic and was treated with IV normal saline and calcium gluconate. EKG showed HR 65, no abnormalities. Initial labs showed hyponatremia, but were otherwise normal. She remained hypotensive and oliguric, requiring treatment with dopamine, phenylephrine, pressin, 5.5 L crystallloid fluids, calcium gluconate and high dose insulin-dextrose. Despite therapy, her mental status waned and she required intubation. She developed hypoxia necessitated intubation. Arterial blood gas (ABG) analysis revealed that the product contained an inhibitor pack- age revealed that the product contained an inhibitor pack- age revealed that the product contained an inhibitor pack- age revealed that the product contained an inhibitor pack- age revealed that the product contained an inhibitor pack- age revealed that the product contained an inhibitor pack-

282. Euphorephabetic after Bladder Irrigation with an Aluminum-Containing Solution
Aleguas A, Patil N. MA/RI Regional Poison Center, Boston, MA, USA.
Introduction: Bladder irrigation with aluminum contain- ing solutions is a common treatment for hemorrhagic cystitis. We report a case of progressive aluminum-induced methemoglobinemia after bladder irrigation with a 1% aluminum ammonium phosphate solution. Case report: An 87-year-old patient was admitted to the hos- pital with frank hematuria and secondary prostatic irritation, and exacerbated for treatment of a urinary-tract infection. A 1% bladder irrigation solution of alum- inum ammonium phosphate solution was prepared by the pharmacy and administered by continuous infusion.

283. Methemoglobinemia from Radiator Anti- freeze Ingestion with an Additive
Murphy NG, 1Keefe LD, 2Magee KD, 2Carew MA, 1Sonter T, 1Thompson JR, 1Bona RD. 1IWK Regional Poison Centre, Halifax, NS, Canada; 2Department of Emergency Medicine, Dalhousie University, Halifax, NS, Canada.
Background: Ingestion of antifreeze can result in ethylene glycol, methanol, or glycol ether toxicity. Toxicity from additives is not well characterized. We report a case of radia- tor antifreeze ingestion resulting in methemoglobinemia due to nitrites in the additive. Case report: 32 year old male presents by ambulance to the ED 1 hour after intentional ingestion of 375 mls of “Flo-Perm antifreeze/cooler” with dizziness, lethargy, headache and nausea. Initial oxygen sat- uration was 90%. Her labs showed a glycolic acid level of 12 mmol/L. The patient was hemo- lyzed and her methemoglobin level was 58%. Methylene blue was administered. A repeat MetHb level was 13%. Ethylene glycol level was 55 mmol/L with a glycolic acid level of 12 mmol/L. The patient was hemo- dialized, extracited, and medically cleared within 2 days. The antifreeze additive was identified as Ecto tip. Case discussion: Methemoglobinemia is not an expected compli- cation of antifreeze ingestion. Micromedex search results for antifreeze do not identify any methemoglobinemia-inducing agent. How “radiator antifreeze” is searched, combinatory inhibi- tor ingredients are listed, but the concentration is not. Examples of these inhibitors are borates, triethanolamine, phosphoric anhydride, and sodium nitrates. The Material Safety Data Sheet may lack this information: for the product in this case only monothylene glycol and diethylene glycol were listed. Multiple phone calls to the manufacturing company revealed that the product contained an inhibitor pack- age with sodium nitrite at 0.44% by weight, which would mean a maximum of 1.65 g of sodium nitrite if 375 mls were ingested. For comparison, 600 mg of sodium nitrite, when used in treatment of cyanide poisoning, induces a MetHb level of ~17%. Conclusion: We present a case of methemoglobinemia induced by an additive in antifreeze.

284. Impact of Mandatory Carbon Monoxide (CO) Detectors on CO Exposure and Severity
Prosser JM, 1Soghian S, 1Minini AF, 2Nelson LS, 1Hoffman RS. 1PCRC, New York, NY, USA; 2Mt Sinai School of Medicine, New York, USA.
Introduction: In New York City, CO detectors became mandatory in homes and businesses on 11/1/04. The purpose of this study was to determine if implementation
of this legislation changed the incidence or severity of CO poisoning reported to the PCC. Methods: The PCC database was searched for all CO calls between 1/1/00 and 8/31/08. The results were divided into 46 months pre-implementation and 46 month post-implementation mandatory CO monitoring periods. Exposures were classified dichotomously as either minor effect (AAPCC definitions of effect, minor effect, not followed minimal clinical effects possible), or major effect (definitions moderate effect, major effect or death). Unrelated effects, cases not followed, and confirmed nonexposures were excluded. Chi square analyses were performed. Results: In 46 preregulatory months there were 4,137 CO exposure calls and in 46 postregulatory months there were 4,054 (p = .16). There was no significant difference in the percentage of CO deaths in the 2 periods (1.0% compared to the preregulatory period (0.11%, p < .0001). Discussion: Mandatory CO monitoring decreased the incidence of consequential outcomes without increasing the number of calls related to CO exposure. This study is subject to all the limitations of a retrospective review such as unstandardized coding of severity and lack of confirmation of exposure. Notably the data may not reflect the true incidence of CO exposure. Additionally, in this analysis we excluded cases that could not be followed. Conclusion: The number of carbon monoxide exposures reported to the PCC was unchanged after mandatory CO de use. However the proportion of reported cases with major effects decreased after the implementation of this legislation. Mandatory CO detection appears to be a useful intervention to decrease the severity of CO poisoning.

285. Seizure Following Kratom Exposure
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1Upstate New York Poison Center, Syracuse, NY, USA; 2SUNY Upstate Medical University, Department of Emergency Medicine, Syracuse, NY, USA; 3Bassett Health Care, Cooperstown, NY, USA; 4Wadsworth Center, Albany, NY, USA.

Background: Kratom, Mitragyna speciosa Korth, a tree native to South Asia, has a long history of use as a traditional medicinal. It may be gaming popularity as a drug of abuse in the United States. A number of recent reports have documented toxicity in human specimens has prevented confirmation of observed clinical effects. We present a case of human toxicity following ingestion of Kratom confirmed by quantitative analysis of urine using high performance liquid chromatography coupled to electrospray tandem mass spectrometry (HPLC-ESI/MS/MS). Case report: A 64 year old male was brought to hospital after a seizure at home. Past history included chronic abdominal pain and depression treated with amitriptyline and oxycodone. On arrival to the emergency department the patient was awake and gave a history of Kratom ingestion for chronic pain. Vital signs were blood pressure 143/70, pulse 110, respiratory rate 14 and temperature 98.1. Finger stick glucose was 118. Physical examination was normal. Electrolytes were normal in the ED. A blood test showed sinus tachycardia with narrow complexes. Electrolytes were normal. Drug screening was positive for cannabinoids, triyclic antidepressants and oxycodone. While in the ED, the patient sustained a second seizure leading to intubation. He was extubated 30 hours later and had an uneventful recovery. A urine specimen collected on presentation was submitted to the Wadsworth Center, New York, for evaluation of Kratom. A methodology was developed for Kratom detection in human urine using HPLC-ESI/MS/MS. The mitragynine concentration in the urine was 50.2 and 4.1 ng/ml. Discussion: The case report demonstrates a previously unreported adverse effect related to the use of Kratom. The pathogenesis of this is unclear but may include adenosine antagonism or stimulation of adrenergic and/or serotonergic receptors similar to tramadol. Our observation is limited by the lack of any recognized causality between Kratom use and seizures. Conclusion: Kratom abuse may rarely be associated with seizures.

286. The Addition of an Alpha-Agonist to High-Dose Insulin in the Rescue of Swine Poisoned with a Dihydropyridine Does Not Improve Outcome
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2Wayne State University, College of Medicine, Detroit, MI, USA; 1UPMC Children's Hospital, Pittsburgh, PA; 3UPMC Regions Hospital, St. Paul, MN, USA.

Purpose: To compare rescue with high dose insulin (HDI) alone versus HDI plus an alpha-adrenergic agent in treatment of overdose due to a dihydropyridine calcium channel blocker. Given the vasodilatory properties of the dihydropyridines, our hypothesis was that the addition of an alpha-adrenergic agent would improve survival, cardiac index (CI), mean arterial pressure (MAP), and systemic vascular resistance (SVR). Methods: There were three arms with five pigs in each of the following: control (C), insulin/glucone (IN), only, and phenylephrine plus insulin (PE/IN), only. Pigs were anesthetized with thiopental and nitrous oxide, underwent tracheostomy, placement of a Swan-Ganz catheter and an arterial line. All pigs received a nifedipine (N) infusion of 0.125mcg/kg/min until a point of toxicity was reached, deﬁned as a 25% decrease in the baseline product of MAP x cardiac output. A 20ml/kg bolus of saline (NS) was infused over 10 minutes and the N infusion continued over a 4 hour resuscitation period. The IN arm was given a 2 mcg/kg/min infusion of insulin to a target of 3.6 mcg/kg/min after full titration of N. The above parameters were recorded. Results: No baseline differences among the groups, including time to toxicity, were found. One pig survived in the C arm, four in the IN arm and 5 in the IN/PE arm (p = .32 for IN/PE to IN). When comparing IN (n = 5) to the PE/IN (n = 5) arms by two-tailed t-test at the conclusion of the resuscitation no differences were found for CI (p = .05), SVR (p = .34), heart rate (p = .95), MAP (p = .99), PVR (p = .97) or base excess (p = .36). Conclusion: Survival was not different between the IN and IN/PE arms. No differences were found for cardiovascular parameters at the end of the resuscitation. Implications for Translational Practice: The addition of phenylephrine to high-dose insulin does not improve the treatment of toxicity due to dihydropyridine calcium-channel blockers.

287. Neonatal Triglyceride Levels after Massive Lipid Bolus – Implications for Lipid Rescue
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1Children’s Hospital Of Michigan Regional Poison Control Center, Detroit, MI, USA; 2Wayne State University, Detroit, MI, USA.

Background: Lipid emulsion therapy has been used for parenteral nutrition as well as therapy for intoxication from lipidic drugs. Prior to this use it has been used for premature infants for both nutrition as well as an aide in lung maturity. Reported complications include pulmonary fat emboli, peripheral ischemia from capillary occlusion, and seizures. We report a case of a more than 10x overdose in a premature infant. Case report: A six day-old 1.5 kg ex-30 week premature infant presented to our nursery over a ten hour period instead of the ordered 7.5 ml daily. Her triglycerides were 4804 mg/dl (54.7 mmol/L) within 2 hours after she received the bolus. She was noted to have no respiratory distress. She received levocarnitine 60 mg in her IV solution starting 10 hours post lipid infusion to aide in metabolism. Subsequently her BUN rose from 7 mg/dL immediately after infusion up to 28 mg/dL 4 days later and subsequently declined. There were no changes in her creatinine, urine output, or other labs. Discussion: Little is known about the effects of sudden massive infusions of lipid emulsions. With an estimation of 90ml per kilogram of circulating blood volume, this patient received ~75% of her blood volume as a bolus. Repeated measurements of her triglycerides showed first order kinetic elimination with a half-life of 1.6 hours. Levocarnitine is added routinely to the parenteral nutrition of premature infants and is a cofactor involved in long-chain fatty acid transport and mitochondrial oxidation of medium chain mitc. Little is known about the effects of sudden massive infusions of lipid emulsion or its effects on levocarnitine levels. Conclusion: This is the largest reported case of lipid infusion overdose in a premature infant. The patient’s blood volume. We calculated an elimination half-life for the patient’s triglycerides at 1.6 hours which is longer than the half-lives commonly reported in infants. The fat emulsion for lipid rescue of lipolipidic drugs increasingly demonstrates efficacy, levocarnitine supplementation may be a useful adjunct. More research is needed.

288. Failure of Standard Octreotide Dosing To Prevent Recurrent Hypoglycemia Following Sulfonylurea Exposure in a Child
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1New York Poison Control Center, New York, NY, USA; 2St. John’s University College of Pharmacy, NY, USA.

Background: Octreotide is an effective treatment for refractory hypoglycemia caused by sulfonylurea exposure. The current dosing recommendation for pediatric patients is 1-1.25 mcg/kg subcutaneous every 6 hours. Case report: A 12 month-old boy (10.3 kg) was found by his mother playing with an open bottle of her glimepiride. About an hour later the child became minimally responsive. EMS arrived and the child’s blood glucose (BG) was 49 mg/dL, for which a bolus of IV dextrose (D50W) was administered. The child immediately responded, arriving to the ED with normal vital signs and alert. For the next 24 hours the patient was monitored closely and a BG of 67 mg/dL. Thirty minutes later he became lethargic again, and had a BG of 47 mg/dL. The child was given a repeat bolus of D50W, octreotide 10 mcg subcutaneously, and was admitted to the PICU. Despite a second dose octreotide 10 mcg 6 hours later, repeated bouts of hypoglycemia developed requiring an increase to 12.5 mcg of octreotide SQ, which still did not consistently improve BG. The four hour scheduled dose was increased to 15 mcg subcutaneously, which along with IV dextrose and oral feedings finally eliminated hypoglycemia. It took approximately 16 hours from admission in the ED to stabilize her BG. Case discussion: The case reminds us that the dosing of octreotide is empiric and failures may occur. It may be necessary to increase the dose, increase the frequency, or even consider continued lipid infusion. A drug of octreotide in patients who have refractory hypoglycemia despite IV dextrose and oral feedings following inges- tion of a sulfonylurea. Short-term adverse events of high dose octreotide are minimal, and most commonly are local or gastrointestinal. It may be difficult to assess younger patients for symptomatic hypoglycemia. Aggressive therapy is needed given that hypoglycemia in infants and children has been associated with neuro- logical damage and developmental delay. Conclusion: Octreotide failures may occur with empiric dosing and meticulous clinical and BG monitoring is warranted.

289. Do NPDs Opoid Related Human Exposure Calls Reflect Opioid Sales?
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1Cincinnati Children’s Hospital Medical Center, Cincinnati, OH, USA.

Do NPDs opioid related human exposure calls reflect opioid sales? Background: Poison centers have experienced a rise in opioid cases. Do these reflect availability or an increase in abuse? A recent study did not identify data on all cases in the AAPCC NPDs database for 2000-2007 involving exposures to one of the
following opioids: hydrocode, oxycodone, codeine, tramadol, methadone, morphone, fentanyl, hydromorphone were obtained. Data was entered into a sequel SQL database with a multidimensional analytic architecture. Sales data for specific scheduled prescription opioids were obtained from the US DOJ website (ARCoS - as grams equivalent to grams morphine). Opioids were obtained from the US DOJ website. Sales data for specific scheduled prescription opioids were obtained from the US DOJ website (ARCoS - as grams equivalent to grams morphine). Pain signs on arrival were HR-140 bpm, BP-130/80 mm Hg, febrile, and O2 sat of 100%. Physical examination was otherwise unremarkable. ECG revealed a sinus tachycardia at 140 bpm with a QTc-100 ms and a QRS of 90 ms. Initial arterial blood gas showed a pH of 7.35,paCO2 of 35 mmHg, and paO2 of 73 mmHg. Serum lactate was 3.2 mmol/L with an anion gap of 20. Serum creatinine phosphokinase was measured at 796 IU/L and BUN/creatinine was 9/1 mg/dL. Acetaminophen concentration was negative. AST and ALT were 62 and 134 IU/L respectively. Abdominal and chest radiographs were unremarkable. BAL therapy was initiated intramuscularly at 2.5 mg/kg every 6 hours along with urinary alkalization with sodium bicarbonate. Gastrointestinal symptoms resolved after 6 hours with normalization in vital signs. Whole blood arsenic was initially 3226 mcg/L (<23 mcg/L). After 24 hours of chelation, the whole blood arsenic was 101 mcg/L. A 24-hour urinary arsenic was 56,855 mcg/L (<80 mcg/L). Lwth specification revealing an organic concentration of 15,560 mcg/mL and an inorganic concentration of 42,002 mcg/mL after 12 hours after initiation of chelation. After 5 days of chelation, a 24-hour urinary arsenic collection revealed an arsenic concentration of 577 mcg/L. The patient remained asymptomatic throughout his 1 week hospital stay with transition to succimer. The patient’s child was discharged on day 11. Upon hospital discharge, the patient was lost to follow-up. Prior reports of human exposure to MA reveal various sequelae including transaminisits and ototoxicity. However, very few reports of arsenical medicine ingestions are reported in the medical literature. This may be the highest level reported without consequential sequelae after chelation and urinary alkalization.

291. Child Abuse with Cough/Cold Medications
Vin S,2 Rose B,1 Green JL,1 Dart RC,1,2 Pediatric Cough/Cold Medication Surveillance Team,1 1Rocky Mountain Poison & Drug Center–Denver Health, Denver, CO, USA; 2The Children’s Hospital, Aurora, CO, USA.

Background: Published reports on pediatric deaths associated with cough/cold medicines suggest malicious intent was a contributing factor in some cases. Objective: Describe reports of malicious use of cough/cold medicine in children as detected through ongoing safety surveillance. Methods: Cases with adverse outcomes associated with the use of cough/cold medications reported in 2008 were collected from English language literature, National Poison Data System, FDA AERS and media reports. An independent expert panel reviewed all cases to determine causal relationship between each reported drug and event using predetermined definitions and then judged exposure, intent of administration and potential contributing factors. Results: 387 cases of children age 0–12 yrs were reviewed. Cases were detected in 2008 but actual events may have occurred in prior years. Data to specify/exclude malicious intent were not always present. Of 35 fatalities, 6 reported child abuse and/or homicide. All but 1 child was <2 yrs (range 7 wks–5 yrs). In 3 cases overt signs of physical abuse were noted: 1) bruising, 2) rib fractures, 3) skull fracture, burns, ligature marks. Diphtheridymenia was implicated in 5 cases and dextromethorphan in 1. In all cases the dose administered was judged supratherapeutic with elevated drug levels present in 3 cases. In at least 3 cases the intent of drug administration was sedation. Non-fatal cases involving clearly malicious use of these medications may have occurred, but were not detected in this system. Discussion: Malicious use of cough/cold medicine was associated with 6 pediatric deaths. Physical abuse was evident in half the cases suggesting that intentional poisoning may be a component of physical abuse or conversely that using drugs as a weapon of child abuse may be a component of physical abuse. Involving clearly malicious use of these medications was evident in half the cases suggesting that intentional poisoning may be a component of physical abuse or conversely that using drugs as a weapon of child abuse may be a component of physical abuse. Involving clearly malicious use of these medications was evident in half the cases suggesting that intentional poisoning may be a component of physical abuse or conversely that using drugs as a weapon of child abuse may be a component of physical abuse. Involving clearly malicious use of these medications was evident in half the cases suggesting that intentional poisoning may be a component of physical abuse or conversely that using drugs as a weapon of child abuse may be a component of physical abuse.
294. Munchausen Syndrome from High Dose Caffeine Presenting with Ventricular Dyshyrmias

Williams SR, Vaglio JC, Schoenhard JA, Saavedra P, Raj SP. Vanderbilt University Medical Center, Nashville, TN, USA.

Introduction: Xenobiotics are sometimes used to create a factitious disorder in patients who seek secondary gain. Available agents include over the counter products that are taken in excess. Case: A 34 year old female emergency medical technician with a history of hypertension was admitted to the hospital for a wide complex tachycardia. She had a history of palpitations for which she had received an extensive cardiology outpatient workup and had been started on sotalol. Other medications included esomeprazole, sertraline, tiagabine, hydrochlorothiazide, gabapentin and albuterol. She was scheduled for an implanted loop recorder to definitively exclude organic disease. In the pre-operative area, she was agitated, tremulous and had nausea with episodes of emesis. She had a wide pulse pressure and developed runs of stable ventricular tachycardia. She refused to answer questions regarding use of dietary supplements or complementary agents. Laboratory studies revealed a leukocytosis of 13.6 K/microL, serum bicarbonate of 15 mmol/L with an anion gap of 25. Her serum potassium was 1.9 mEq/L. Salicylate level was 0.9 mg/dL. Because her clinical presentation mimicked a methylxanthine poisoning, a theophylline level was measured and was 4.7 mg/L. Comprehensive urine drug screen confirmed presence of sertaline, metoprolol, cyclobenzaprine, and diphenhydramine. A caffeine level of 128 mg/L later returned and confirmed excessive use (normal level <20 mg/L). Patient was treated supportively and her dysrhythmias self-resolved. Documentation by the primary care provider at follow-up noted that the patient stated she had taken “diet pills”. Discussion: Caffeine is a methylxanthine with a wide therapeutic index; however, large ingestions may produce clinical manifestations that are similar to theophylline poisoning. 7-Demethylation of caffeine produces a small amount of theophylline as measured in this adult patient. Conclusions: We report the use of high dose caffeine to induce an illness that included stable ventricular tachycardia.

295. Transient Diabetes from the Administration of Human Growth Hormone for Performance Enhancement

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Introduction: Exogenous human growth hormone (HGH) is being administered illicitly by a variety of athletes with the intent of performance enhancement. Although known to induce insulin resistance, only one previous report details transient diabetes associated with its use for this purpose. Case report: A 43 year old previously healthy male without a family history of diabetest presented to the emergency department (ED) with a one week history of progressive polyuria, polydipsia, and weight loss. Over the preceding 7 months he had been administering subcutaneously the illicitly acquired HGH somatropin (Serostim®) in “cycles”, with the goal of athletic enhancement. He denied the use of any other medications, including anabolic steroids. Vitals and physical exam were normal with the exception of a dry mouth. Lab testing revealed: glucose 554 mg/dL, sodium 129 mmol/L, bicarbonate 25 mmol/L, normal renal function, normal ast, and the absence of urinary ketones. He was treated with IV normal saline and insulin in the ED. He was instructed to stop any further use of the HGH, and was discharged on metformin. Blood glucose was subsequently checked daily. A low dose of glyburide was temporarily added in addition to metformin to control his blood glucose. Four weeks after presentation, his blood glucose remained in the normal range despite removal of both oral diabetic medications. Discussion: Transient diabetes associated with HGH use has been described in the literature. Although the association between transient diabetes and HGH use has been documented, to our knowledge there has been no description of a case of diabetes that developed due to the administration of HGH. Conclusions: This case illustrates that the administration of HGH may lead to transient diabetes. In patients with new onset diabetes in the setting of recent administration of HGH, consideration should be given to the possibility of transient diabetes due to administration of HGH.

296. Medical Toxicologist Attitudes on Compensation for Services Provided to Poison Control Center

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Background: Little is known regarding medical toxicologists’ perceptions of venous and arterial venous care and patient care provided to poison control centers (PCCs) or about their attitudes regarding compensation. Our aim was to survey and describe the attitudes of American College of Medical Toxicology (ACMT) member toxicologists regarding compensation by PCCs. Methods: This is a survey of physician members of ACMT performed by the ACMT practice committee. All ACMT members were contacted by e-mail and asked to complete a survey with the opportunity to provide further comments. An additional attempt was made to collect survey responses at the ACMT national meeting. No compensation was provided for participation. Results: 152 ACMT members provided survey responses (27.6% response rate). 40 (26.2%) respondents described themselves as poison center directors, 24 (15.8%) as associate/director assistants, and 51 (33.6%) as poison center consultants. 20 (13.2%) respondents reported having no poison center involvement. All respondents felt that toxicologist consultations are useful (100%). Only 34 respondents (22.5%) felt that toxicologists are fairly compensated for their work. 148 (97.4%) agreed that medical toxicologists should be compensated for their time. Only 2 respondents (1.3%) disagreed. Of PCC directors, 31 (7.5%) reported “always” being compensated for their work. Only 2 (5%) reported “never” being compensated for their work. 16 (40%) PCC directors felt that toxicologists are fairly compensated. This is opposed to non-PCC director toxicologists of whom 20 (29.4%) reported that they are “always” compensated for their work. 33 (48.5%) reported “never” getting compensation. Only 13 (18.8%) non-PCC director toxicologists felt that toxicologists were compensated for their work. Conclusions: Medical toxicologists feel that they provide a useful service and that they should be compensated for their work. The majority of respondents do not feel that medical toxicologists are fairly compensated. Most PCC directors are compensated by PCCs, however many non-director toxicologists are not.

297. Reversal of Ventricular Tachycardia (VT) in a Patient from Lidocaine with Amiodarone

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Introduction: Treatment of medication induced dysrhythmia’s can be approached from different aspects. One treatment approach which has not been described in the literature is the use of amiodarone for lidocaine induced arrhythmias. Case Presentation: A 78 year old female who was diagnosed with small-cell lung cancer presented to the hospital for Port-A-Cath placement. The patient also has a past medical history of hypertension, asthma, and CAD. The patient has chronic hyponatraemia with serum sodium of 122 secondary to SIADH. The patient received the Port-A-Cath placement and was transferred to the surgical floor. Shortly after the patient arrived she had developed shortness of breath. Upon reviewing the chest x-ray it was discovered the patient had developed a pneumothorax. The patient was then prepped for chest tube placement. The patients’ shortness of breath was relieved; however she then began to have mental status changes. Upon arrival to the ICU the patient began to develop EKG changes. The patient had a heart rate that increased from 80’s to 170’s with a VT rhythm. After further review of the patients’ recent procedures it was determined that the new mental status changes and EKG changes could be secondary to toxicity. The patient had received lidocaine 1% (50 ml vial) of which 17 ml was used during the Port-A-Cath placement. In addition, during the chest-tube placement lidocaine 2% (30 ml vial) was used. A lidocaine level request from the laboratory and demonstrated a blood level of 8.2 mcg/ml. The patient was then given amiodarone 300mg intravenous bolus for treatment of VT. The patients EKG changes resolved. After 36 hours the lidocaine blood level was 1.5 mcg/ml and the patient returned to her normal baseline mental status. Discussion: Lidocaine cardio toxicity is difficult to treat often requiring multimodal therapeutic interventions (i.e. cardiodiomyopathy bypass, lidemulsion therapy). While case reports have previously described suppression of ventricular arrhythmia secondary to sotalol and flecainide, it has not been described to reverse Lidocaine-Induced VT as a sole agent.

298. Long Term Outcome from Selenosis Due to Nutritional Supplementation

Haggerty DA, Curtis J. Drexel University College of Medicine, Philadelphia, PA, USA.

Background: Selenosis is an uncommon disease, occurring associated with nutritional deficiency. We present a case of selenosis in a young man taking a nutritional supplement later found to contain elevated selenium and chromium levels due to an error in

Table: Proportion of opioid and stimulant mentions by caller site and intent

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formulation. Case report: A 29 y/o male began taking Total Body Mega Formula nutritional supplement for chronic fatigue. After taking two doses, the patient developed recurrent emesis, for which he was evaluated by a gastroenterologist. He continued taking 1 ounce daily as indicated by the manufacturer. Within 2 weeks he experienced intermittent nausea, diffuse lower extremity myalgias and arthralgias, and numbness of the fingers and toes. He subsequently was seen in our clinic for concerns of selenium toxicity. Physical examination findings were largely improved, but diffuse transverse sinus tachycardia at a rate of 175 with normal intervals. All other electrolytes were normal. EKG demonstrated hypotension(2), tachycardia(1), wheeze(1), dyspnoea(2) and unconsciousness(1). Of the 58 cases that occurred in the home, 38 were considered non-venomous, 6 venomous, 16 unidentifiable and 13 involved unidentified snakes. In those patients who suffered the most serious symptoms, the species of snake was known i.e. the Rat snake and the Gable viper. Where the species of snake was unknown the most common cases reported included symptoms including swelling, pain, erythema, malaise and parasthesia. Conclusion: This study reports no cases of fatal toxicity from snake bites. Exposure to unknown snakes may present unique challenges. Discussions difficult to justify. Snake-handlers should know the species they handle, so that management information can be identified and if necessary the appropriate anti-venom obtained.

301. Know Your Pet - How Important Is It To Know the Snake You Own? Cooper GA, Dyas J, Thompson JP. UK National Poisons Information Service (Cardiff), Cardiff, Wales, United Kingdom. Background: In the UK there is only one native snake known to be venomous, the Vipera berus or European viper (adder). Not all bites result in envenomation and fatal cases are extremely rare with only 14 deaths in the UK since 1876 - the last in 1975. Reports of bites from non-identified snakes is more common in the UK and may well be due to confusion of the symptoms of grade IV scorpion envenomation and allowed for prompt extubation. DEX is an ideal agent in the treatment of scorpion envenomations due to its ability to decrease sympathetic outflow, its short duration of action and its lack of respiratory depression.

302. Inhalant Online Education: Any Time. Any Place Finkenstein GB,1 Heinen MA.2 1Fletcher Allen Health Care, Burlington, VT, USA; 2Northern New England Poison Center, MaineHealth, Portland, ME, USA. Background: It can be difficult to encourage parents to attend in-person inhalant abuse prevention education sessions. Internet technologies, such as web-based trainings, may be effective ways to disseminate prevention education. Methods: A fifteen-minute web-based inhalant abuse training was launched in December 2006 and promoted at outreach events and to key agencies using email lists and postcard mailings. The goal of this project is to decrease inhalant abuse among youth by increasing awareness about inhalant abuse among parents and adults who interact with youth. The training includes prevention strategies, teaching guidelines, and local, regional and national data and resources. The registrant evaluation consists primarily of closed-ended questions. A certificate of completion is available upon submitting the evaluation. Evaluation and zip code data are compiled quarterly. Results: There were 284 registrants in 2007–2008. Zip code analysis revealed that registrants were from throughout the state, including many small towns where outreaches had never been conducted. A total of 74 participants completed the evaluation. Of these, 92% (n = 68) stated they had greater confidence in talking to a child about inhalant abuse and 97% (n = 72) planned to talk to a child about it. Discussion: The web-based training is cost-effective and has reached adults throughout the state. Those that completed the evaluation were satisfied with this training and plan to take preventive actions to help reduce inhalant abuse. Discussions: In order to get the most out of this effective web-based training, continuous targeted promotion of the website needs to be done. The zip code analysis will help target areas for promotion. Limited access to computers potentially restricts use of this education tool. In addition, a one time 15-minute online training cannot guaranty retention of the information provided. Future research is needed to assess the impact of this tool on youth inhalant abuse trends.

303. Colchicine Kinetics in Non-Fatal Overdose Bora KM,1 Dolcourt BA,1 Aaron CK.2 1Children's Hospital of Michigan Regional Poison Control Center, Detroit, MI, USA; 2Wayne State University, Detroit, MI, USA. Colchicine is an uncommon drug but deadly in overdose. It causes microtubule formation leading to multi-organ system failure. We report a colchicine overdose with multiple blood levels in a patient with renal and hepatic failure.
and had multiple episodes of emesis and diarrhea. His initial vital signs were BP 90/60, P 70, R 20, T 36.7°C. On exam he was guaiac negative, had delayed capillary refill of 3 sec, no abdominal tenderness and was appropriately and alert and oriented. Labs were K+ 6.6, CTO, HCO3−, 12, anion gap 35, BUN 26, Cr 4.0, pH 7.31, PCO2 21, lactate 6.6 mmol/L, WBC 41.7 and saleyctase 32.3 mg/dL. Ten days prior his labs were normal. Upon further questioning, he admitted taking all of his colchicine 2 days ago. His pharmacy confirmed filling 90 tabs of 0.6 mg colchicine 2 days prior to presentation. He was admitted to the ICU, developed altered mental status, bronchorrhea, and hypoaxia resulting in intubation. He also developed thrombocytopenia, a GI bleed, anemia resulting in transfusions, and had several rounds of dialysis. He survived the ICU course and was discharged with a creatinine of 0.6.

Our patient ingested a maximum dose of 0.48 mg/kg of colchicine and given his delayed presentation and severity of illness was thought unlikely to survive despite having a dose less than 0.6 mg/kg. Colchicine is thought to have 20-40% unchanged renal elimination and 1st order hepatic metabolism with enterobiperic reexcretion. Kinetics data in colchicine overdose are rare. We calculated elimination T1/2 of 70.3 h, longer than the 40-60 h reported in normal dosing. Due to the enterobiperic reexcretion and lack of alternate therapeutic options, colchicine may benefit from multiple dose activated charcoal. This was not done in this patient because of his GI bleed.

Colchicine toxicity is potentially deadly without a good antidote. We documented a prolonged elimination half-life in this non-lethal overdose. The decreased GI motility and hepatic and renal damage from colchicine toxicity may contribute to its prolonged half-life in overdose.

304. Role of Poison Control Centers in a Public Water Contamination Warning and Response System

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Background: In 2007, the Cincinnati Drug and Poison Information Center (DPIC) was invited to participate in the public health component of the Environmental Protection Agency’s Water Security Initiative. This component of this partnership involved methodology for real time surveillance of poison center (PC) calls to identify possible water contamination (WC) events. Method: WC events thought to be relevant were identified using search terms, and called upon DPIC to identify potential WC events.

Results: There were 47 WC events reported in 2007. Of these events, 24 events were identified as potential WC events. Six of the 24 events met criteria for inclusion in the study. Of these, 3 events were confirmed as WC events. Of these, one event was confirmed as a WC event.

Conclusions: It is likely that only a small percentage of potential WC events are actually identified by public health officials. This is in part because emergency responders may not be familiar with the potential WC events.

305. Adverse Drug Effects of Therapeutic Psycho- tropic Medication in Young Children

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Introduction: Increasing prescription of atypical antipsychotic medications for children has been reported in recent studies. The ramifications of this increasing use require more research with the patient safety and adverse drug events that may result. Objectives: To evaluate both the frequency of calls to our poison center reporting adverse drug effects, and the level of medical attention required in children who are given their own or a family member’s psychotropic medications.

Methods: Retrospective review of 715,701 human exposure poison center records from 2000-2008, for cases of psychotropic medication ingestions in children less than 12 years of age. Results: A total of 1639 calls over this time period involved psychotropic medications in children under 12 years of age for any reason. Of these, 613 occurred when the child was given their usual dose of medication, more medication than prescribed or a family member’s medication. A 20% sample of these cases were reviewed in detail; of the 125, 11 were found not to fully fit the inclusion criteria. Drugs involved were risperidone, 23 clozapine, 20 quetiapine, 7 olanzapine, 5 ziprasidone, 1 buspirone. Ten cases involved 2 agents, and 1 involved 3. As the reason for exposure, therapeutic error/ intentional misuse (excessive amount given) was most common, 75/114 (66%); unintentioned misuse (child received medication intended for another member of the family), in 19/114 (17%); intentional abuse (dose given for increased effect), 5/114 (4%); adverse drug effects at the intended dose were reported in 16/114 (14%). Moderate adverse effects (such as dysticktic reactions) occurred in 8 patients at their usual dose (7% of the 114) and in 5 at excessive doses (4% of the 114). 23 cases (20%) were evaluated in an ED, of which 4 (4% of the 114) were admitted. Conclusions: There is a paucity of data on the safety of psychotropic medication prescribed to children despite the increased use. Additional information about the correct dose and safe use of psychotropic medications in children is needed to guide appropriate use.

306. Hydrofluoric Acid as an Agent for Self-Mutilation

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Self-mutilation is a serious but incompletely understood phenomenon. We report a case of a 34-year-old female who had applied hydrofluoric acid to her right hand over the course of seven days. It has been hypothesized that liberation of endogenous opioids either before or during the injury is associated with the feelings of release associated with the painful cutting, burning, or other mutilation. Chemicals that produce immediate pain and vomiting. His vitals were BP 110/71, R 18, T 36.3°C. An abdominal X-ray showed numerous radioopaque foreign bodies. His initial labs included a hemoglobin 4.6 g/dL, WBC 1100, zinc 1050 mcg/dL, and a copper <2 mcg/dL. The patient received intermittent whole bowel irrigation, copper supplementation and granulocyte colony-stimulating factor which resulted in the passage of coins, a reduction in the zinc level, and resolution of his neutropenia.

Discussion: This patient presented to our hospital 8 years earlier with a similar presentation and underlying pathology. On the first admission, he was treated with early chelation and surgical removal of coins by gastrotomy with those pen- nies that could not be removed advanced into the colon, past the site of zinc absorption in the jejunum. On this admission, he was treated only with whole bowel irrigation. Multiple zinc levels were obtained on both admissions and elimination rates were determined. The half-life with surgery and chelation was 111.6 hours and with whole bowl irrigation it was 103.4 hours. Additionally, CaNa2EDTA binds and eliminates copper as well as zinc. This is a potentially dangerous therapy in zinc toxicity as the copper deficiency causes the life-threatening anemia and neutropenia.

Conclusion: Elimination half-lives were essentially equivalent for treatment with and without chelation. Chelation with CaNa2EDTA will decrease the copper level and potentially worsen the patient’s condition. Removal of the coins through gastrotomy is variably associated with those pen- nies that could not be removed advanced into the colon, past the site of zinc absorption in the jejunum. On this admission, he was treated only with whole bowel irrigation. Multiple zinc levels were obtained on both admissions and elimination rates were determined. The half-life with surgery and chelation was 111.6 hours and with whole bowl irrigation it was 103.4 hours. Additionally, CaNa2EDTA binds and eliminates copper as well as zinc. This is a potentially dangerous therapy in zinc toxicity as the copper deficiency causes the life-threatening anemia and neutropenia.

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307. Kinetics of Zinc Elimination with and without Chelation

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There are several case reports of zinc toxicity resulting from ingestion of pine nuts in the literature with recommended therapies ranging from surgical removal to chelation with CaNa2EDTA to whole bowel irrigation or combinations of these. There are at least two reports that state preoperative chelation should be done to reduce the zinc levels. We report a case of receiving in zinc toxicity where the same patient allowed us to compare zinc kinetics with and without chelation.

Case report: A 55 y/o male with a history of schizophrenia and HIV presented with abdominal pain and vomiting. His vitals were BP 122/45, P 97, and a temperature of 37.2°C. Due to his abdominal pain and vomiting, and a history of significant alcohol intake, zinc and copper levels were checked. He had a copper 1100 mcg/dL, zinc 475 mcg/dL, and a lactate 6.6 mmol/L, WBC 41.7 and salicylates 32.3 mg/dL.

Conclusions: This case represents the first documented use of hydrofluoric acid for self-mutilation and raises questions about the theory of psychophysical arousal associated with immediate pain or bleeding. It also underscores the importance of maintaining a high index of suspicion for self-mutilation when hydrofluoric-acid exposure occurs in unusual settings and the importance of investigating and ruling out serious systemic effects from this kind of exposure.

308. Incidence of Actual Toxic Alcohol Exposure in Patients Given Fomepizole Therapy

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Background: Since the FDA approval of Fomepizole (4MP) in 1997, it is often administered in cases of reported or suspected toxic alcohol exposures (methanol, ethylene glycol, and isopropyl alcohol).

309. Table 1. The number of cases of detectable toxic alcohol levels and clinical toxicities likely related to a toxic alcohol exposure

<table>
<thead>
<tr>
<th>Alcohol Type</th>
<th>Number of Cases</th>
<th>Clinical Toxicity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>38</td>
<td>19</td>
<td>No</td>
</tr>
<tr>
<td>Methanol</td>
<td>4</td>
<td>1</td>
<td>NA</td>
</tr>
<tr>
<td>Propylene Glycol</td>
<td>42</td>
<td>23</td>
<td>11</td>
</tr>
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Table 2. Reported Visual Disturbances in M exposure

<table>
<thead>
<tr>
<th>Alcohol Type</th>
<th>Number of Cases</th>
<th>Clinical Toxicity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>38</td>
<td>19</td>
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<tr>
<td>Methanol</td>
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<td>23</td>
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(M) and/or ethylene glycol (EG)). **Purpose:** Among the patients who received 4MP, we investigated the percentage (%) of those who had detectable levels (> 0) and/or clinical toxicity likely related to M or EG exposure. Clinical toxicity is defined as 1) anion gap metabolic acidosis (AGMA); AGMA is defined as anion gap > 12, 2) new visual disturbances in the presence of an AGMA in M exposure, or 3) renal failure [serum creatinine (C) > 1.2 mg/dl] in the presence of an AGMA in EG exposure. **Methods:** We searched two hospital pharmacy databases on patients who received 4MP between 1-1-98 and 7-31-08. A chart review was performed and a case report form (CRF) was used for data collection. The data were extracted by three data abstractors who were blinded to the purpose of the study and trained in data abstraction. Inclusion criteria: Patients who received 4MP during our study period. Exclusion criteria: Patients who did not meet the inclusion criteria. **Results:** There are total of 93 cases. See Table 1. Out of 93 patients treated with 4 MP, 36 of them had a detectable toxic alcohol level or clinical toxicities likely related to a toxic alcohol exposure. **Discussion:** The major limitation in our study is errors which may have occurred during data abstraction or entry. **Conclusion:** Our study suggests that only 36/93 (39%) of the patients who receive 4MP have an actual M or EG exposure and 57/93 (61%) do not.