

INGESTIONS AND POISONINGS

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GENERAL INFORMATION

Washington Poison Center is still just south of Northgate Mall (24 hrs/day) – 1-800-222-1222 (Staff MD toxicologists are on beeper call around the clock for advice; urge you contact for any unusual cases or management concerns The “Children’s Poison Service” or (U.W. Med. Tox. Service at U.W. Medical Center and Harborview Medical Center)—same physicians will also provide immediate medical toxicological consultation, Call 1-800-222-1222.)

## Key References:

- \* Poisindex CD-ROM Computerized System (through Poison Center)  
Updated quarterly (currently > 1,000,000 items)  
Includes product ingredients, symptoms, and managements
- \* Dart, RC: *Medical Toxicology* (Poison Center)
- \* Goldfrank L, et al: *Toxicology Emergencies*
- \* Haddad & Winchester: *Clinical Management of Poisoning & Drug Overdose* 1997
- \* Plus an extensive collection of other texts and an indexed reprint file (at Poison Center). See also Residents’ Teaching File and Texts at CHRMC Library)

INFORMATION GATHERING

Seek out and document specifically:

- 1) WHO INGESTED (highest incidence < 3 yrs old & adolescents).
- 2) WHAT WAS INGESTED (product name, generic name or “popular” name—i.e., coke.  
Use ingredient identification on label or call Poison Center.  
Look for tablet/capsule imprint numbers; decode via Poison Center--Identidex
- 3) HOW MUCH WAS INGESTED (estimate volume, pill count, etc. At best only 50% accurate).  
Assume the maximum in the container if not absolutely sure.

		<u>Paper Cup</u>	<u>1.5 cm Bottle Mouth</u>
Average volume	Child < 4 yrs	4 ml	1 ml
per swallow:	Adult - male	30 ml	15 ml
	- female	20 ml	10 ml

- 4) THE TIME OF OR INTERVAL SINCE INGESTION. (When did it happen?)
- 5) THE OCCURRENCE AND PROGRESSION OF SYMPTOMS (include specific times).
- 6) THE PHYSICAL FINDINGS (include specific times).

DRUG LEVELS AND DRUG SCREENS: Always confirm units being reported against norms.

Experience here and elsewhere confirms most drug screens do not contribute significantly to the management of overdoses; histories and physicals usually suffice. In contrast, specific blood levels do prove of value for aspirin, acetaminophen, iron, theophylline, digoxin, barbiturates, dilantin and tegretol, methyl isopropyl and ethyl alcohol and ethylene glycol. NOTE: CHRMC lab does STAT serum salicylate, acetaminophen and iron levels!!! All others are sent to HMC.

Possible Screen Indications - i.e., will therapy, (or the record), be helped?

- 1) Unusual signs and symptoms, especially unexplained psychosis, altered mental status.
- 2) Confusing problem with multiple drug ingestion.

Available Screens (Often Poison Center may supply prior experiences.)

All sent via CHRMC Lab to Harborview Toxicology Lab.

(PLEASE STATE SUSPECTED DRUGS ON THE REQUISITION AS AN AID TO THE LABORATORY). If sent STAT, phone report available in two hours; final report within four hours. Call lab directly for consultation/questions: CHRMC 987-2101; HMC 731-3451. Urge sending both urine and blood, even if only urine screen is requested, in case subsequent quantification of a drug is indicated.

### DRUG SCREENING PANELS

- 1) UTXS/GTXS Urine (or Gastric): Requires 25 mL - \$75.00±. Comprehensive screening detects more than 100 drugs.
- 2) UDA Urine Drug Abuse: Requires 25 mL - \$55.00±. Detects the following drugs:
 

Amphetamines	Cocaine	Barbiturates
Benzodiazepines	Opiates	Cannabinoids
Phencyclidine	Ethanol	Methadone
		Tricyclic Antidepressants
- 3) SHDS Serum (Sedative/Hypnotic): Requires 5 mL of serum = 10 mL whole blood - \$75.00±. Detects the following drugs:
 

Amobarbital	Butalbital	Butabarbital
Chlordiazepoxide	Diazepam	Thcylorvynol
Glutethimide	Meprobamate	Methaqualone
Methypylon	Pentobarbital	Phenobarbital
Phenytoin	Secobarbital	Ethchlorvynol

\*Screens 1 and 2 are clinically the more useful screens; GHB detectable only by State Toxicology Lab.

### MANAGEMENT

General Measures: (Remember that simple observation may be best option of all.)

- 1) Induced emesis (more effective than gastric lavage - stress home use)
 

Contraindications: caustic ingestion, comatose patient, convulsions but not simply fear of convulsions – or more than 90 minutes after ingestion!

Syrup of Ipecac: administer as soon as possible

Infants (any age!) & children - 15-30ml (may repeat in 20 min)

Adults - 30ml (may repeat in 20 min)

Encourage fluid administration of any variety.
- 2) Activated charcoal (easy to order-hard to get down! Use NG tube-it works!)
 

1-2gm/kg in 60-120ml water in closed bottle, shake; sorbitol combo, too—makes a slurry.

Dose: children 30 +/- gm; adults 50 +/- gm. Emesis follows charcoal administration in 10-40% of patients; aspiration increasingly common. If you use charcoal, do it as soon as possible.

Avoid charcoal-sorbitol combo for repeat dosing!
- 3) Gastric lavage

Consider only when emesis contraindicated; supplement with charcoal.

Placed cuffed endotracheal tube first in any comatose patient > 3-5 yrs.

Lavage with small aliquots (10cc/kg) WARM SALINE, or 0.5 NS repeatedly, up to 1-3 L.
- 4) Cathartics

Totally useless; no good studies of effectiveness whatsoever! This includes whole gut lavage.

- 5) Increasing urine output with intravenous fluids - BEWARE!!!  
Generally adds little if patient is already well hydrated; may cause cerebral edema - in general not recommended.
- 6) Diuretics  
Generally not useful.
- 7) Ion trapping (via acidification or alkalinization of urine or stomach contents)  
Most useful in acute salicylate ingestion.  
For urine alkalinization: 2-3 mEq NaHCO<sub>3</sub>/kg bolus IV with repeat dose 1.5 mEq NaHCO<sub>3</sub>/kg in 30 min. as needed to keep urine pH > 7.0.  
For other information, see Poisindex. Remember IV NaHCO<sub>3</sub> for tricyclic overdoses to prevent cardiac tachyarrhythmias.

**Specific Measures:**

Acetaminophen - Worry if the dose exceeds 150-200 mg/kg in the child and 10-12 grams in the adult. Only then induce emesis, possibly followed by charcoal, even if Mucomyst likely. If any doubt, be suspicious of history.

Obtain blood level and consult nomogram for expected toxicity.

N-acetyl-cysteine (Mucomyst)<sup>®</sup> loading dose 140 mg/kg p.o., then 50-70 mg/kg p.o. for 3-18 repeat doses q6hrs dependent upon clinical course; may give via continuous NG drip. If only borderline toxicity, Washington Poison Center urges no more than 3-5 doses. Disasters = transplants

Acute transaminase SGOT or ALT are most useful liver function test; may exceed 20,000 without problems. Locally prepared IV solutions avoid emesis problems; today off label IV dose is widely used--so get consent.

As of January, FDA approved IO preparation to be suitable—finally! Available in July 2004.

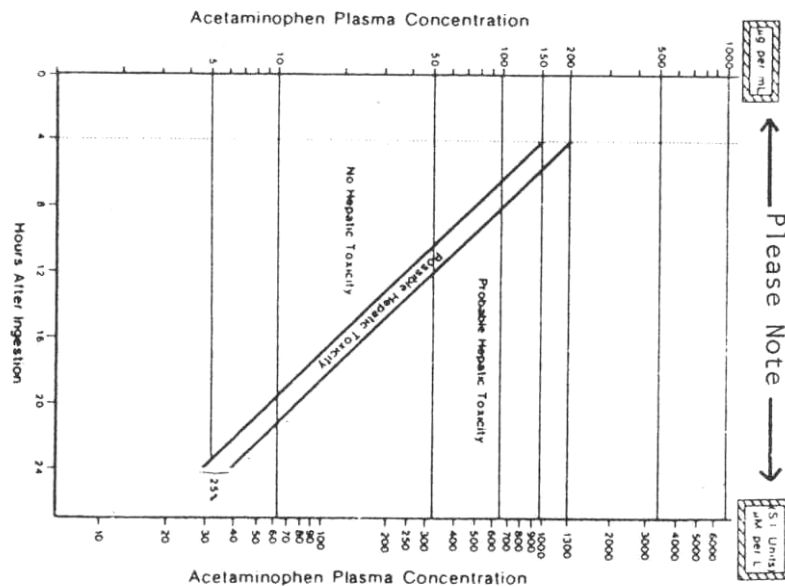


Diagram #1 - Semi-logarithmic plot of plasma acetaminophen levels vs. time, for use following single ingestions of acetaminophen. (Copied from *Harriet Lane Handbook*, page 286, 12th Edition, Mosby Year Book 1991.) Be sure to check units of lab reports; some nomograms use 2 or 3! No change to nomograms over the years.

Barbiturates - Support vascular and respiratory systems. Enhance renal excretion (of phenobarbital only) with urine alkalinization. Consider dialysis but RARELY indicated. Stimulants are contraindicated!!

Benzodiazepines - Alone: safe (alcohol potentiates action; Flumazenil is an approved benzodiazepine antagonist shown to be an effective antidote for severe overdose).

Beta-blockers - Traditional efforts to pharmacologically correct plus glucagon. Asthmatics at special risk.

Caustics/Lye - Usually non-emergent endoscopy 6-24 hrs. after ingestion if high pH. Both use of antibiotics and steroids after endoscopy still sometimes employed, but are of dubious value.

Calcium channel blockers - Generous IV calcium administration -levels go in to 20's. Support hypotension!

Digoxin - Remarkably "non-toxic" in kids, but can be bad; consider "Digibind" fab fragments (still expensive). "Pre" blood level definitely indicated before Digibind. Acute on chronic problems.

Dilantin - Prolonged obtundation and elevated serum levels as long as seven days; supportive Rx is established approach. Occasional dialysis.

Hydrocarbons - Due to lack of systemic absorption, generally resort to neither emesis nor lavage. Emesis may be indicated to remove secondary ingredients contained in hydrocarbon (i.e., parathion), and emesis is preferred to lavage. Pulmonary aspiration is the primary cause of morbidity.

Iron - Calculate dose of elemental iron ingested, and worry if this is > 50-60 mg/kg. Empty stomach. Charcoal = no value! Obtain serum iron concentration, consider hospitalization if > 400 mcg% and associated with signs or symptoms. For > 450-600, consider Desferral (deferoxamine) IV followed by an infusion in D<sub>5</sub>W at rate < 15 mg/kg; may cause hypotension. See packages insert. Ignore Fe in kids' "chewable" vitamins - to date 110,000 cases - almost nontoxic!

Opiates/Opioids - (Dextromethorphan, Demerol, Morphine, etc.) Give Naloxone 0.2-0.4 mg STAT, repeat prn (20 +/- min.), or use continuous infusion. New longer acting form is po Naltraxone (Trexan) or IV Nalmefene.

Mushrooms - Be conservative; don't waste time trying to identify over the phone. CHRMC's recently departed lab guru, Dennis Benjamin, has written the book on mushrooms, it is in the ED. No amanita phalloides north of Portland.

Plants - Be conservative; only rare major problems (<1 dies nationwide) among 100,000 ingestions every year.

Salicylates - Worry if the dose is > 100-200 mg/kg, or if the child is otherwise sick (febrile, dehydrated, etc.) or if chronic. In acute ingestions alkalinize urine with IV boluses of sodium bicarbonate (2-3 mEq/kg) followed by glucose containing IV infusion with sodium bicarbonate - it enhances excretion and may lessen systemic acidosis. It does not work in chronic ingestion!!

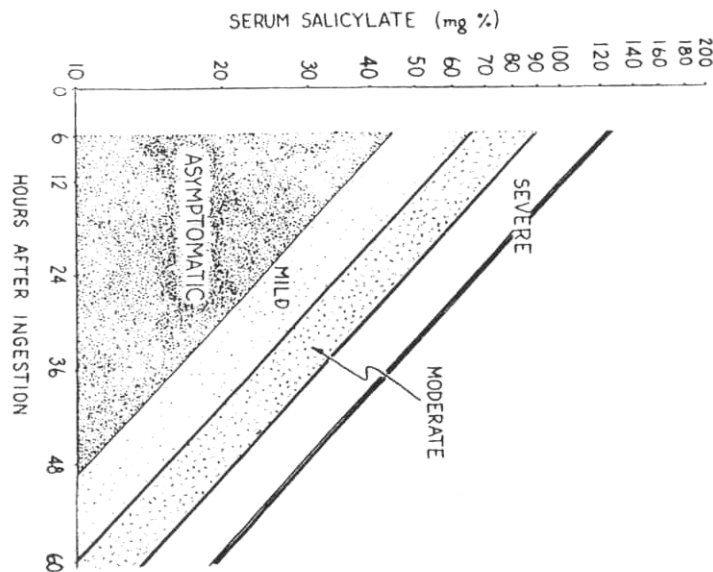


Diagram #2 - Done Nomogram: the nomogram relates serum salicylate and expected severity of intoxication at varying intervals following ingestion of a single dose of salicylate, starting six hours after the ingestion. (Copied from *Harriet Lane Handbook*, page 298, 12th Edition, Mosby Year Book 1991.)

Theophylline - Chronic worse than acute; B-blockers for non-asthmatics. Use Diazepam to control seizures; works very well. ??dialysis usually not needed.

Tricyclics/Anticholinergics - For uncontrollable behavior, coma, seizures, or arrhythmias, admit, monitor and use benzo's. In all events maintain blood pH > 7.45 with sodium bicarbonate, or controlled ventilation if comatose. Control seizures with benzo's. Only if above therapy totally ineffective, possibly consider physostigmine 0.03 mg/kg IV (over 2-3 min). Physostigmine itself may induce seizures. Have atropine drawn up at bedside for use in event of bradycardia or seizure. Remember, six hours without signs or symptoms equals a good prognosis! Of course, fluids and your favorite adrenergic if hypotension.

### PREVENTION

Poison Center packets are available without charge in the Emergency Room or at Poison Center. Every family seen for an ingestion should receive one of these and encouraging instructions on childproofing their home.

### POSTSCRIPT

In any diagnostic dilemma, don't overlook accidental ingestion as a distinct possibility. Remember the Poison Center is available 24 hours daily. It is staffed by specially trained nurses and pharmacists; back-up medical consultation by Board certified physician toxicologists is available around the clock. Please feel free to call any time, day or night. We only get upset if you fail to call - night or day!

### CONCLUSION

Many factors have combined to lower morbidity and mortality from poisoning in the pediatric age group. Nationwide less than 30 deaths per year in kids < 6 years--< one per state. But 2-3 times as many (100-150) deaths among children!--occur annually in our nation's hospitals as a result of medication mixups. Do your best to minimize such errors in the first place.

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