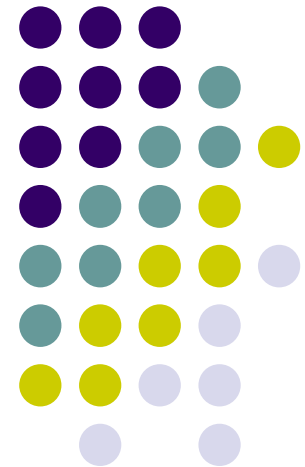


In The Name of GOD

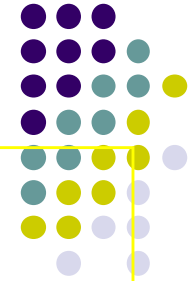
*Poisoning in children.*

F-Farnaghi MD

Department of Pediatrics  
Shaheed Beheshti University of Medical  
sciences  
Loghman-Hakim Hospital



# Introduction: 2017



- | The most **common agents** ingested by young children include *cosmetics, personal care product, analgesia, and cleaning solutions.*
- | **Fatal** childhood poisonings are commonly caused by **analgesics, fumes /gases/vapors and cough and cold preparations.**
- | >2 million poisoning call in USA , more than half (62% in 2014) male predominance in <13 & female predominance in >13.
- | <13 year ; more unintentional.
- | >13 year : intentional
- | 91% in **home** and **single** substance (90%) حذف شود



## *In IRAN:*

- | Common childhood poisoning:  
Opium, Drugs, Hydrocarbons, Corrosive agents, Co.....
- | Drugs: (CNS, Analgesic, Cardiovascular, Iron, ..)
- | Fatal poisoning: Opium, Organophosphate insecticides, CO, TCA, ALP, ..
- | Snake bites & Scorpion sting (Regional)

# ***CLINICAL MANIFESTATIONS:***



- I A thorough ***history*** is a key component in the evaluation of a child with possible poisoning. Determination of all substances that the child was exposed to, **type** of medication, **amount** of medication, and **time** of exposure is crucial in directing interventions. Available data often are incomplete or inaccurate, requiring a careful ***physical examination*** and rarely **laboratory** approach. In many cases poisoning is diagnosis of **exclusion**.

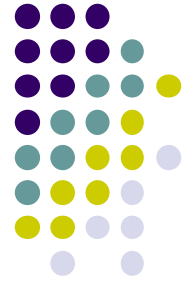


# Physical Examination :

- | A targeted physical exam is important to identifying the toxin and assessing the **severity** of the exposure. Initial efforts should be directed toward **assessing and stabilizing the Airway, Breathing, Circulation, and Mental status**.
- | Once one has ensured that the airway is secure and the patient is stable from a cardiopulmonary standpoint, a more extensive physical exam can help to identify characteristics of specific toxins or classes of toxins.
- | In the poisoned patient, the key features of the physical exam
- | are the **vital signs, mental status, pupils** (size, reactivity, nystagmus),
- | **skin, bowel sounds, and odors**. Together, these findings might suggest a **Toxidrome** that can guide the differential diagnosis and initial management.

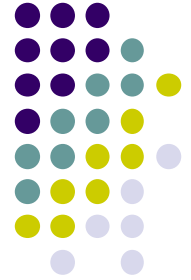
# Complications:

## Six basic clinical patterns:



- | Coma
- | Direct toxicity Toxicity
- | Metabolic acidosis
- | Heart rhythm aberations
- | GI
- | Seizure



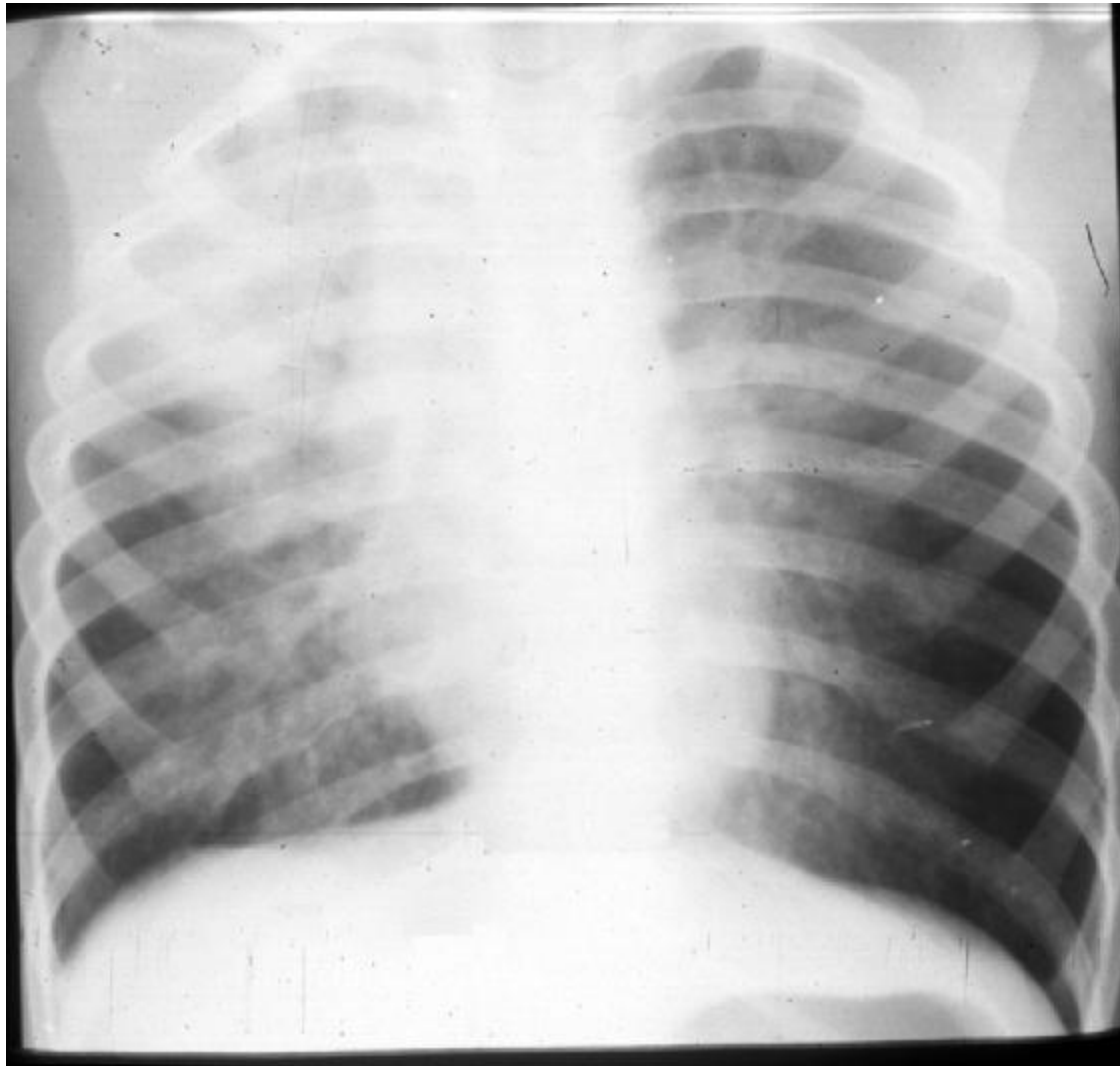
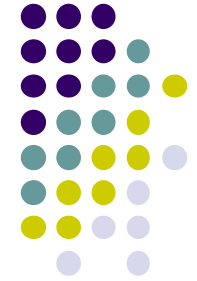


# \$ Caustic ingestion:

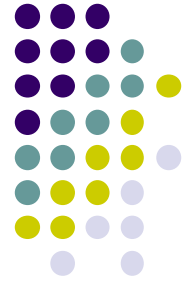
- | Acid: Quagulation necrosis
  
- | Alkali : Liquefaction necrosis



# Hydrocarbon Pneumonitis.



# \$ Hydrocarbon risk for aspiration:



- | Low Surface tension
- | Low viscosity
- | High volatile

# **\$CNS Signs:**



- | **Ataxia:** Alcohol, barbiturates, anticholinergics, narcotics
- | **Coma:** Sedatives, narcotics, barbiturates, salicylate, cyanide, carbon monoxide, cyclic antidepressants, alcohol
- | **Hyperpyrexia :** Anticholinergics, salicylates, amphetamine, cocaine.
- | **Muscle fasciculation:** Organophosphates, theophylline
- | **Muscle rigidity:** Cyclic Antidepressant ,PCP ,Phenothiazine, Haloperidol
- | **Peripheral neuropathy:** Lead, arsenic, mercury, organophosphates
- | **Altered behavior :** Amphetamines, cocaine, alcohol, anticholinergics, LSD, PCP



## Seizure: (CAPS)

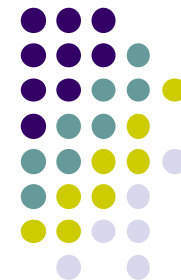


- | **C**arbamazepin, Carbon Monoxide, Camfor, Cocaine, Cyanide
- | **A**minophylin, Amphetamine, anticholinergics , Antidepressants
- | **P**b(lead), lithium, Pesticide(Organophosphate) Phenol, Phenothiazine, Propoxyphene,
- | **S**alicylate, Strychnine
- | [... Tramadol, Theophyllin, Lidocain, Cocain, Hypoxia, Hypoglycemia, ...]

# ***\$Respiratory Signs:***



- I **Depressed respiration:** Alcohol, narcotics, barbiturates.
- I **Increased respiration:** Amphetamines, aspirin, ethylene glycol, carbon monoxide, cyanide
- I **Pulmonary edema** :Hydrocarbons, organophosphates,.



## ***Cardiac Signs:*** \$

- | **Tachycardia**: Atropine, aspirin, amphetamine, cocaine, cyclic antidepressants, theophylline
- | **Bradycardia**: Digitalis, narcotics, mushrooms, clonidine, organophosphates,  $\beta$ -blockers, calcium channel blockers
- | **Hypertension**: Amphetamine, cocaine, PCP, LSD
- | **Hypotension**: Phenothiazines, barbiturates, cyclic antidepressants, iron,  $\beta$ -blockers, clonidine calcium channel blockers, ..

# \$Ocular Signs:



- | **Miosis**: Narcotics (except meperidine, propoxyphene, pentazocine), organophosphates, muscarinic mushrooms, clonidine, phenothiazines, chloral hydrate, barbiturates (late).
- | **Mydriasis**: Atropine, cocaine, amphetamines, antihistamines, cyclic antidepressants, PCP, LSD
- | **Nystagmus**: Phenytoin, barbiturates, ethanol, carbamazepine, Ketamine, PCP, Dextromethophan
- | **Lacrimation**: Organophosphates, irritant gas or vapors
- | **Retinal hyperemia** : Methanol
- | **Poor vision** : Methanol, botulism, carbon monoxide

# Mydriasis



- | Consider other causes
- | In poisoning must be bilateral(except Drug-induced hemorrhage,..)

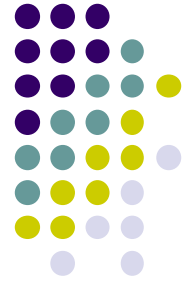




## \$Odor:

- | **Bitter almonds** :Cyanide
- | **Alcohol**:Ethanol,
- | **Acetone**: Isoprop alcohol, Metanol, paraldehyde, salicylate
- | **Wintergreen**: Metyl salicylate
- | **Garlic**:Arsenic, thallium, selenium,organophosphates,Aluminium phosphides,..
- | Hydrocarbones,.....

\$



- | ***Cutaneous signs:***(Dry,Hot,Diaphoresis,..)
- | ***Oral signs:***(Salivation,Burn,..)
- | ***Intestinal signs:***  
(Diarrhea,Constipation,blood..)

# **\$Arhythmias:**



- | **Dysrhythmias may be prominent signs of a variety of toxic ingestions.**
- | **Prolonged Q-T intervals may suggest phenothiazine or antihistamine ingestion, and widened QRS complexes are seen with ingestions of **cyclic anti-depressants** and quinidine.**
- | **sinus tachycardia: many drugs**
- | **sinus bradycardia :suggests digoxin, cyanide, a cholinergic agent, or  $\beta$ -blocker ingestion**

# \$ Laboratory & Imaging Studies:



- | Blood gas
- | Electrolytes
- | Osmoles
- | Glucose
- | ECG
- | Toxicology (urine-blood)

# *Anion gap Metabolic Acidosis:*

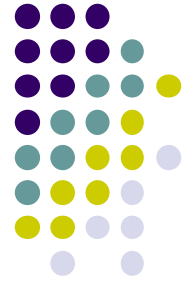
\$



## **Metabolic Acidosis (Mnemonic: **mudpiles**)**

- | **M**ethanol, carbon monoxide
- | **U**remia\*
- | **D**iabetes Ketoacidosis
- | **P**araldehyde, phenformin
- | **I**soniazid, iron
- | **L**actic acidosis(cyanide, Carbon monoxide)
- | **E**thanol, ethylene glycol
- | **S**alicylates, starvation, seizures

# Hypoglycemia:\$



- | Ethanol
- | Isoniazid
- | Insulin
- | Propranolol
- | Oral hypoglycemic agents

# Radiopaque substance

## \$ CHIPED:

- | C hloral hydrate, Carbonate calcium
- | H eavy metal
- | I ron
- | P henothiazines
- | E nteric coated
- | D ental amalgam



# RECOGNIZABLE POISON SYNDROMES:(Toxidrome)



- | Sympathomimetic
- | Anticholinergic
- | Cholinergic
- | Narcotics
- | Sedative-hypnotic
- | Acetaminophen, Salysilates, Iron, CO, Cyanide, TCA,...



# *Anticholinergic syndrome:*



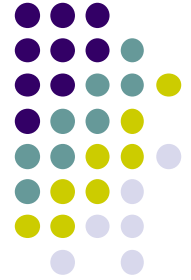
- | Fever
- | Flushing
- | Urinary retention
- | Blurred vision
- | Decreased bowel sounds
- | *Myoclonus*
- | *Psychosis*
- | *Seizures*

- Ileus
- Tachycardia
- Dry skin
- Mydriasis
- ↑DTR
- Choreoathetosis*
- Hallucinations*
- Coma*

## *Examples:*

TCA, Antihistamines, Anticholinergics, Antipsychotic, Plants, ....

# *Anticholinergic syndrome*



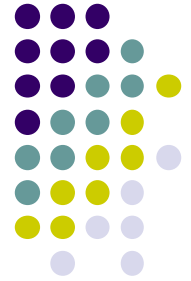


## Datura-stramonium/Jimson weed

اسفناج کوهی/تاتوره



# 3. Opiate



- | Altered mental status
- | Miosis(Pin point)
- | Unresponsiveness
- | Shallow respirations
- | Slow respiratory rate
- | Bradycardia
- | Decreased bowel sounds
- | Hypothermia

# Stimulant Toxidrome (sympathomimetics)



- | Tachycardia
- | ↑BP
- | Agitation
- | Choreoathetosis
- | Psychosis
- | Seizures

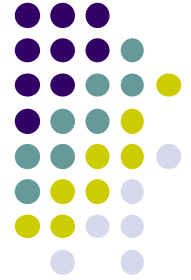
- Mydriasis
- Diaphoresis
- Myoclonus
  
- Hallucinations
- Coma

# Crystallized Methamphetamine

شیشه



# **\$TREATMENT:**



## I Supportive Care :

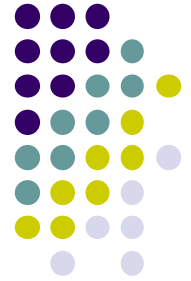
**ABCD**

- . If the level of consciousness is depressed, and a toxic substance is suspected, **glucose** (1 g/kg IV), 100% **oxygen**, and **naloxone** should be administered

# ***TREATMENT 4 focui***

**\$**

- | Supportive care
- | Decontamination
- | Enhanced elimination
- | Specific Antidotes







**چگونگی برخورد با مسموم**

**ارزیابی فوری**

**حال بحرانی**

**حال عادی**

**مسموم با وضع بحرانی**

**ارزیابی فوری ارگان‌ها**

**تشنج**

**نارسائی تنفسی**

**اقدام سریع کنترل**

**شوک**

**آریتمی**

**اغماء**

## TREATMENT:

# ***Gastric Decontamination : \$***



- | *Great Controversy!!!*
- | **Syrup of Ipecac:** Should not be used
- | **Gastric lavage:** Should not be used routinely
- | **Single dose Activated Charcoal:**  
(1 hour, Selectively)
- | **Cathartic** alone (Sorbitol or magnesium) : No role
- | **WBI (Whole bowel irrigation):** Sustained-release or enteric coated, iron, lead, zinc, Packet of illicit drugs.



## ***Activated charcoal: \$***

| **Ineffective in:**

Caustic or corrosive

Hydrocarbons

Heavy metals (arsenic, lead, mercury, iron, lithium)

Glycols

and water –insoluble compounds.

**TREATMENT:**

# ***Activated charcoal***



Universal antidote |

آنتی دوت غیر اختصاصی |

بسیار مؤثر (دیالیزروده ای) و کم عارضه |

بهترین زمان تجویز 1 ساعت اول |

کنترا اندیکاسیون: مواد نفتی، مواد سوزاننده ، انسداد روده و ... |

مؤثر نیست: فلزات سنگین، آهن، الکل ، لیتیوم. |

# Enhanced Elimination: \$



- | **MDAC**=Multiple dose activated charcoal  
(Carbamazepine-Dapsone-Phenobarbital-  
Quinine-Theophyline)
- | **Urine Alkalization:** (Salicylate-Methotrexate)
- | **Dialysis:** (LowMW,Low prot binding,Low  
vd,high water soluble): Methanol,Ethylene  
glycol,Salicylate, Theophyline ,Bromide and  
lithium.)

# Specific Antidotes: \$



Poison	Antidote	Dosage	Comments
Acetaminophen	<b>N-Acetylcysteine</b>	140mg/kg Po then 70 mg/kg q4hx17 dose IV à	Most effective within 16 hour
Benzodiazepine	<b>Flumazenil</b>	--	Possible seizure, arrhythmia, Do NOT use for unknown ingestion
$\beta$ -Blocking agents	<b>Glucagon</b>	0.15 mg/kg IV, then infusion 0.05-0.15mg/kg/hr	
Carbon monoxide	<b>Oxygen</b>	100%, Hyperbaric O <sub>2</sub>	Half-life Carboxyhb in room air $\approx$ 5hr, but 1.5 hr in 100% O <sub>2</sub>
Cyclic antidepressants	<b>Sodium bicarbonate</b>	1-2 meq/kg IV, followed by continuous infusion; titrated to pH=7.5-7.55	Follow K level and replace as needed

# Specific Antidotes: \$



Poison	Antidote	Dosage	Comments
Iron	Defaroxamine	infusion 5-15 mg/kg/hr IV(max6gr)	Hypotention(worse with rapid infusion)
Lead	EDTA BAL  Succimer	IV IM  PO	Sterile abscess, Do not use in peanut allergy
Nitrites/ Methamoglobinemia	Methylene Blue	1-2mg/kg iv q30-60 min For level>30%	
<b>opiates</b>	<b>Naloxone</b>	0.1 mg/kg IV, ET , SC ,IM up to 2mg, repeat as needed	
Organophosphate	Atropine  +  Pralidoxime(2PAM)	0.02-0.05 mg/kg IV/ET repeat 5-10min as needed   25-50mg/kglv over5-10min (max 2000mg/min)may repeat after1-2hr then q10-12 h as needed	Physiologic :block acetylcholine   Specific: disrupts phosphate-cholinesterase bond



## \$ Prognosis:

I Most poisoning are minimal or no toxicity

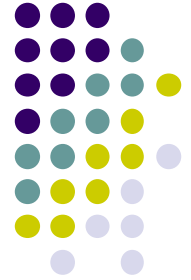
I Major effects ;5.2% Intentional

;0.2% Unintentional

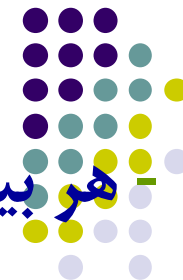
Adolescents are more likely to fatal and major effects compared to young children (17.3% in teens compered with 1.1% in under 6 years)



# \$ Prevention:



- Properly educating parents for safe storage of medications and household product.
- Consult or call a poison center after poisoning.



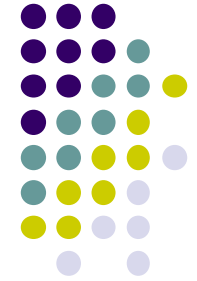
هر بیمار مسموم باید حداقل 4-6 ساعت در اورژانس تحت نظر قرار گیرد.

- مسمومیت هایی که منجر به علائم تأخیری می شوند :  
استامینوفن ، قارچ سمی *آمانیتا فلوئیدس* ، متانول ، متادون ،  
دیفنوکسیلات ، پاراکوات ، برخی انواع ارگانو فسفره (مانند  
مالاتیون ، پاراتیون) ، داروهای منجر به هیپوگلیسمی (مانند  
گلابینکلامید) ، داروهای **sustain release** (مانند تئوفیلین ،  
آهن ، وراپامیل) ، داروها و سموم انعقادی (مانند وارفارین ، مرگ  
موش)

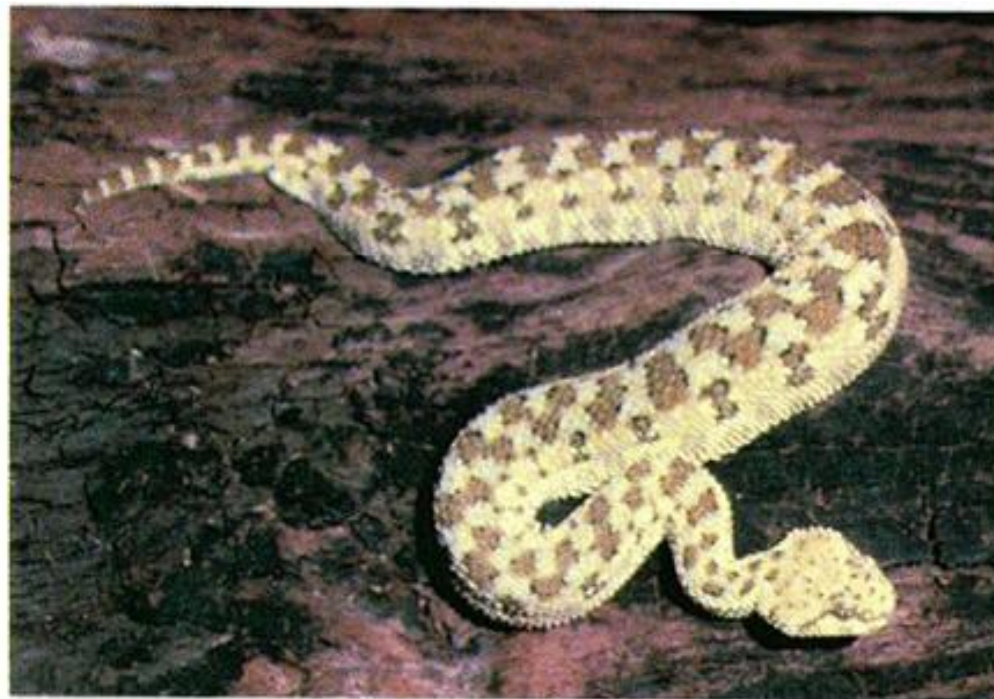
# Activated charcoal.



# Snake Bite.



# Sand Viper.



# Scorpion.



*Androctonus crassicauda*



*Mesobuthus eupeus*

# خرزهره



# از توجہتان سپاسگزارم.

