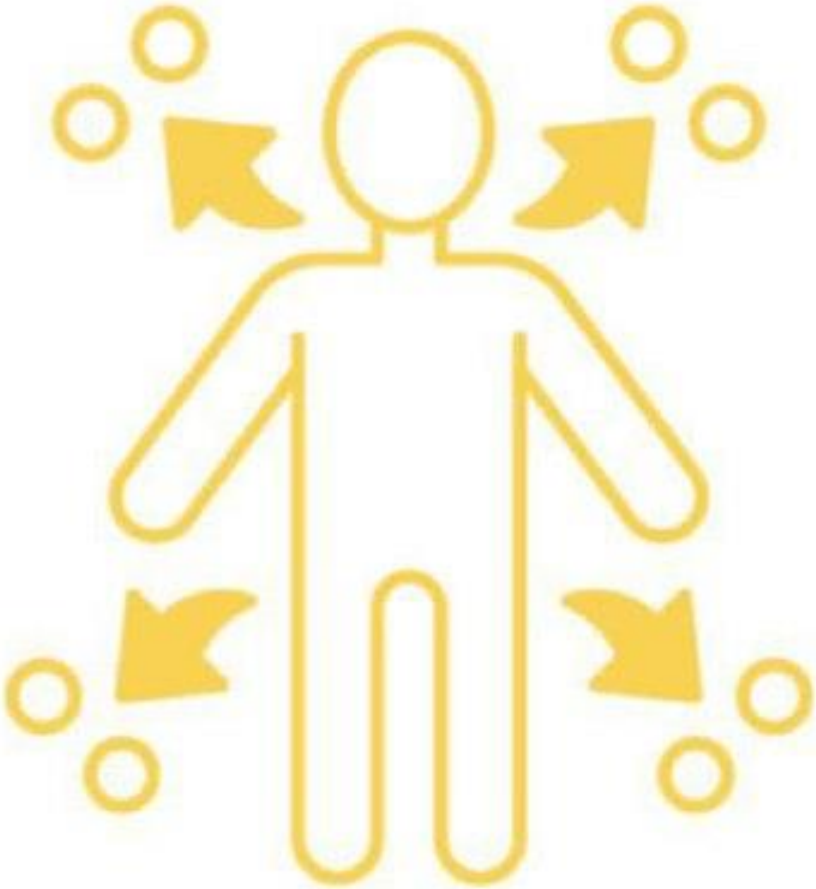


MIRACLE Academy

سموم
زميلتكم نهى حسن

لجان الرفعات

قال تعالى (يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ)

Principle in management of poisoned patient

What to do, and in what order to do it?!

TACHYCARDIA

الأشياء الي تعملها هي (المحفزات) sympathomimetic

- Amphetamines
- Atropine
- Antihistamines
- Caffeine
- Cyanide
- Nitrates

يرفعو الضغط بزيد النبض رح يصير vasodilation

BRADYCARDIA

بالمختصر أي اشي بنوم القلب ويعمل AV block

- Beta blockers
- Calcium channel blockers
- Clonidine
- Digitalis
- Mushrooms
- Organophosphates
- Sedative hypnotics

RESPIRATION

HYPERVENTILATION

Rapid respirations are typical of toxins that produce metabolic acidosis or cellular asphyxia..

أي واحد نفسه سريع بالوضع الطبيعي ممكن يصير معه acidosis زياده CO2 وهاد يعمل اختناق للخلايا

- Salicylates
- Carbon monoxide
- Ethylene glycol
- Hydrocarbons

HYPOVENTILATION

اهم اشي نكون تعرف مين يعمل هايبو وهايبر لانو 100% رح يجي اكثر من سؤال عليهم

- Anesthetics
- Cyanide
- Ethanol
- Sedative hypnotics
- Opioids

TEMPERATURE

هون حكينا هدول يمنعو التعرق فيحبسو السوائل ويرفع الحراره كرد ععكسي

HYPERTHERMIA (>40°C)

- Sympathomimetics
- Amphetamines
- MAOI
- Anticholinergic
- Drugs producing seizures or muscular rigidity

TEMPERATURE

- **HYPOTHERMIA (<32°C)**:
  - ✓ CNS depressants (barbiturates, opioids, ethanol, TCA...),
  - ✓ Hypoglycemic agents
  - ✓ Drugs that cause vasodilation
- …..(especially if accompanied by cold environment)
- N.B: commonly accompanied by hypotension and bradycardia

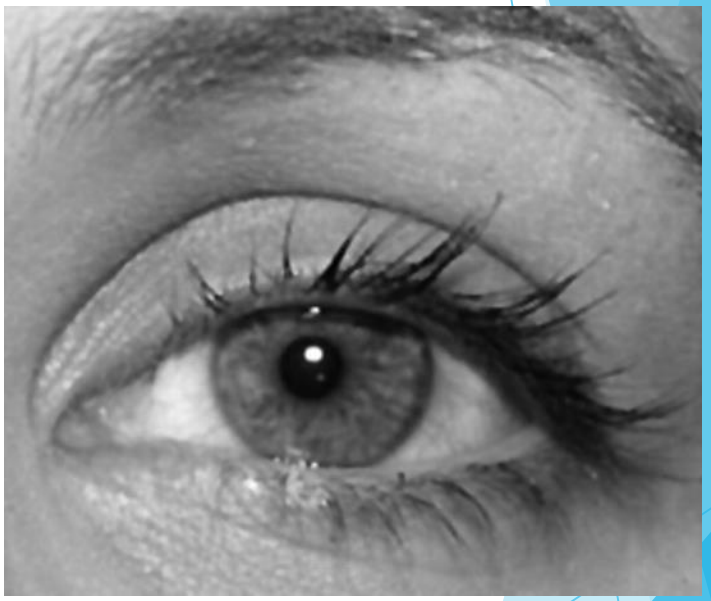
هون يحكو عاده مع انخفاض الحرراه ممكن يصير انخفاض بالضغط ونبضات القلب

اذا الواحد اخذ مخدرات opioid
هيك رع يعمل ولكن نتفق انو لما يصير
withdrawall symptomsرح ينعكس
تاثيرهم
مثلا بدل ما يعمل miosisيصير يعمل
mydriasis

EYE FINDINGS

Miosis:

- Cholinergic
- Clonidine
- Insecticides
- Narcotics
- Phenothiazines



EYE FINDINGS

Mydriasis:

Anticholinergic

Sympathomimetic

Withdrawal states

الي هي رعشه العين
وطبعا يخالف حسب
الماده الي تسممم منها

Nystagmus:

Horizontal……phenytoin, alcohol, barbiturates

& vertical Both Horizontal

suggest phencyclidine stronglyhorizontal:

poisoning

مهلوسات

OTHERS

فش حركه يعني anticolinergic

- **Absent bowel sounds**: paralytic ileus……anticholinergic intoxication or perforation coz of acid ingestion

اذا في صوت يعني cholinergic

- **Hyperactive bowel sounds**, abdominal cramping and diarrhea….organophosphates, *A muscaria*
- Determine if **bladder distention and urinary retention exist**…..anticholinergic intoxication
- **Skin appearance**: red, white, blue, warm, cool, dry, moist, piloerection (opioid withdrawal)

Decontamination

- Gastric exposure
- Inhalation exposure
- Dermal exposure
- Ocular exposure

Inhalation exposure

- Dangerous because of high surface area and high vasculature for absorption…systemically to vital organs
- **Irritant gases exposure**!! mainly in industry, but also after mixing cleansing agents at home, or smoke inhalation in structural fires
- **Health care providers should protect themselves from contamination**
- Eg.: "organophosphate, fumes of H_2S, cyanide, ammonia, formaldehyde"

Inhalation exposure

واحد استنشق مواد سامه تمام اول اشي بعمله ببعده عن البيئه الملوثه بالماده وبعطيه O2 او بعطيه موسع حسب درجه خطورته اذا استنشق أشياء حارقه ممكن تحرق الرئه وتعرفو اذا تعرض أي جزي للحرق بيصير يطلع مي وهاد ممكن يعمل تجمع لسؤال بالرئه

Treatment:

- Immediate removal from hazardous environment
- 100% humidified O2
- Assisted ventilation
- Bronchodilators
- Observe for edema of respiratory tract, or noncardiogenic pulmonary edema. Early signs and symptoms include **“dyspnea, tachypnea, hypoxemia”**
- Monitor arterial blood gases or oximetry, chest x-ray, and pulmonary function

Dermal exposure

بشكل عام لازم الكل يلتزم بمعدات السلامه العامه ولكن في حاله وصولها للجلد او العيون بحاول ابعد المواد الملوثه عن الجلد واذا وصل للجلد بحط عليه مي (raning wate وتضل عليه اقل اشي نص ساعه وتكون المي فاتره مش حاميه حتى ما أوسع الشعيرات وازيد الامتصاص

- Attendant should wear protective gear "gloves, goggles, shoe cover"
- Remove contaminated clothes, contact lenses and jewelry and place them in a plastic bag
- Gently rinse and wash skin with copious amount of water for at least 30min….start with lukewarm water "vasoconstriction"
- Use soap to remove oily substances
- Caustic contamination may need prolonged irrigation

Dermal exposure

في مواد سامه اذا بحط عليها مي بعمل تفاعل وبزيد خطورتها لذلك بعمل الها تنضيف بالفرشاه او بماده غير الماء

- Some **substances may react with water**, should be **brushed off** e.g. chlorosulfonic acid, Ca oxide, titanium tetrachloride

هاي الماده اذا اجا عليها مي تطلق حمض HCLوبزيد حرق الجلد

- For some substances, **local application of certain chemical compound as soaks may be useful**
  - Hydrofluoric acid…calcium gluconate 2.5%
  - Oxalic acid…calcium gluconate.

شايفين هدول اول مادتين بكل نقطه اا يدخلو الجسم يرتبطو مع Caويقللو من نسبته بالدم والعضلات ويسببو الالام بالعضلات فبستخدم gluconate ca ليرتبطو معهم وينسو Ca

Ocular exposure

لازم العين وهي فاتحه بحط عليها مي مستمره لمده 15 دقيقه اذا تعرضت لماده سامه اذا اجا acidعلى العين ما بحط alkali لانو رح يعمل ملح او برفع الحراره تبعت العين بسبب التفاعل

- At least 15-20min irrigation with fully retracted eyelids
- Don't neutralize acid or alkali; continue irrigation until pH of the tear is neutral
- After irrigation examine the eye for corneal damage
- Ophthalmologist consultation:

بعد ما غسلت العين بتاكد انو القرنيه ما فيها اشي وبعطيه قطرات مضاد حيوي

- The ophthalmologist may instill topical cycloplegic agent, e.g. 5% homatropine or 2% scopolamine to prevent spasms of ciliary body

بعطيه هاي خوفا من انه يبطل يشوف

  - Topical antibiotic (sulfisoxazole or gentamicin)
  - Apply a sterile patch

Decontamination

- Gastric Decontamination
- Inhalation exposure
- Dermal exposure
- Ocular exposure

Decontamination

- Gastric decontamination *(decrease absorption)*

حتى يمتص المواد السامه

  - Dilution يشرب مي وقل تركيز المواد السامه
  - Emesis يستفرغ
  - Gastric lavage بغسل معدته
  - Activated charcoal
  - Cathartics ملين حتى ازيد حركه الامعاء
  - Whole bowel irrigation

كل هدول not الا في حالات معينهrecommended

Gastric Decontamination

هون بتحكي النقطه انو في جدل حول استخدام الفحم او غسيل المعده او الاستفراغ لتخاص من السموم

- **Controversy** about the roles of emesis, gastric lavage, activated charcoal, and cathartics to decontaminate the gastrointestinal tract

في دعم قليل لموضوع التخلص من الماده عن طريق الاستفراغ او غسيل المعده بالاخص اذا تأخر المريض الي تسمم اكثر من ساعه

- **Little medical support** for gut-emptying procedures, especially after a **delay of 60 minutes** or more very little of the ingested dose is removed by emesis or gastric lavage

- Moreover, **simple oral administration of activated charcoal without prior gut emptying seems to be as effective as the traditional sequence of gut emptying followed by charcoal**

يحكو انو إعطاء الفحم بشكل عام احسن من اني اخليه يستفرغ او بغسل معدته

Gastric Decontamination

هون يحكو انو ممكن يكون افراغ المعده من السموم بالغالب رح يهدد حياه الانسان اذا ضل لاكثر من ساعتين

- However, in some circumstances, aggressive gut decontamination may potentially be life saving, even after more than 1-2 hours

بعض المواد الي سميتهم عاليه

- Examples: ingestion of highly toxic drugs (eg, calcium antagonists, colchicine), ingestion of **drugs not adsorbed to charcoal** (eg, **iron**, **lithium**), ingestion of **massive amounts of** a **drug** (eg, **150-200 aspirin tablets**), and ingestion **of sustained-release or enteric-coated products**

وفي بعضهم ما بصير الهم امتصاص من خلال الفحم

والجرعه العاليه من الاسبرين

و enteric coated لان لسا ما بكون تاثيرهم بين لانهم بطولو

Decontamination

- Gastric decontamination *(decrease absorption)*
  - Dilution
  - Emesis
  - Gastric lavage
  - Activated charcoal
  - Cathartics
  - Whole bowel irrigation

DILUTION

اذا بضيف ماء على السموم الي تكون acid ممكن يخفف منها ولكن اذا شرب كميه كبيره ممكن يزيد الامتصاص بالمعده وبنشره لكل الجسم

طبعا بس هاي كميه الماء المسموحه اعطيها وتكون لحاله مساعدته عللى الاستفراغ لا اكثر لانه معده بتكون فاضيه

- Dilution of the poison:
  1. 1-2 cupfuls of water to children
  2. 2-3 cupfuls of water to adult
  3. A better rule to give a quantity comfortable swallowed
- Water??
  1. Reduce gastric irritation
  2. Add bulk to the stomach needed later for emesis
- Carbohydrated beverages??....NO!!
  - CO_2 distension of the stomach....opening pyloric sphincter
- Milk??....NO!!
  - Increase absorption of lipophilic toxicant...&....delay emetic action of ipecac

طبعا ما بزبط غير المي وهاي الاسباب

- * …..water is the BEST and ONLY fluid to used when a poison is unknown.

- * Excessive water will distend the stomach, pyloric sphincter relaxation, emptying gastric content into the duodenum….more difficult to remove the poison

- * Emesis successful only if there is fluid in the stomach….water dissolve the poison and provide a vehicle for expulsion

.

General consideration

- Fluids should not be forced
- Excessive liquid may distend the stomach…premature evacuation
- In the case of solid form do not dilute
- Nothing administered orally to unconscious patient or if gag reflex absent

UpToDate

السلايدات حرفيا بتعيد نفس الحكي

- **Dilution** — Dilution was historically recommended following the ingestion of acidic or alkaline corrosives to decrease the concentration and, thus, the tissue damage from the ingestion.

- This approach is problematic and we recommend that it not be performed.

EMESIS…Outdated treatment

علاج قديم

هاي ipecac بيحفز على الاستفراغ

- Emesis was induced with syrup of ipecac (Sol)
- Not longer routinely recommended….BUT activated charcoal
- Decrease absorption of drug but sometimes dangerous….?
- Precautions!!!!

في ناس لما تجي تستفرغ وعندهم بالمعده toxic ممكن يصير مزع بسبب قوه الاستفراغ والي عنده مشاكل بالقلب والي شرايينه ضعاف رح ياثر سلبا عليه وممكن يموت

هسا اذا الحبات الي اخذهم عشان يتسمم فيهم كبار ما بزبط غسيل معده

- The following modalities of GI decontamination have been used in the past but are **no longer routinely recommended**

بيقدر استخدمه ولكن مش دايما

- **Syrup of Ipecac** — Previously a mainstay of prehospital and emergency department management of toxic ingestions, Syrup of Ipecac (SoI)-facilitated gastric emptying is no longer recommended by the American Academy of Clinical Toxicology (AACT), the European Association of Poisons Centres and Clinical Toxicologists (EAPCCT), or the American Association of Pediatrics (AAP).

EMESIS

- **Do not induce vomiting if the poison is a:**
  - Convulsant, or sedative-hypnotic
  - Hydrocarbon (HCs are viscous and have low surface tension…readily aspirated)
  - Corrosive acid or alkali

لانه كثير لزجين ممكن يرجعو على الرئه

- **Do not induce vomiting if the patient:**
  - Unconscious or comatose
  - Absence of gag reflex
  - Have severe CVD or emphysema, extremely weakened blood vessels
  - < 6 months in age (poorly developed gag reflex)

رح يضعف كميه الدم الي رح توصل لشرايين بسبب قوه الضغط

SYRUP OF IPECAC (1648)

لما يوخذ toxic وامتصاصه قليل مع الفحم احسن اشي
يستفرغ وبالأخص اذا بعيد عن المستشفى ولحفظ الوقت

Indications:

- Children that recently ingested known substances that are not well adsorbed by activated charcoal and for whom transport time to a healthcare facility is delayed….save time
- Less traumatic than gastric lavage
- Remove particles of material too large to pass through the opening of a lavage tube

SYRUP OF IPECAC

- Ipecac induce vomiting has 2 phases:
  - ✓ Early: within 15-20 min….direct stimulation of GIT
  - ✓ Late: after 20 min….direct stimulation of medullary chemoreceptor trigger zone

في ناس اذا ما تستجيب على الجرعه الأولى برجع بكرر نفس الجرعه بعد 20 دقيقه وبس

- The dose may be repeated once if no response within 15-20 min
  - Repeat the fluid administration
  - Have the patient sit up or move around, because this sometimes stimulates vomiting
  - If the second dose of ipecac does not induce vomiting, use an alternative method of gut decontamination

Syrup of Ipecac: side effects

- **Drowsiness** occurs in about 20% and **diarrhea** in 25% of children
- **Persistent vomiting** may delay administration of activated charcoal or oral antidotes
- **Protracted forceful vomiting** may result in hemorrhagic gastritis
- **Intracerebral bleeding** in elderly patients, **diaphragmatic rupture**, **aspiration pneumonia**
- Repeated daily use (**bulimic patients**) may result in **cardiac arrhythmias** owing to accumulation of cardiotoxic alkaloids
- Convulsion, skeletal muscle weakness

SYRUP OF IPECAC

- Contraindications:
- Loss of airway protection reflexes
- Toxicants produce abrupt loss of consciousness (ethanol, ultrashort BZDs, short-acting barbiturate, heterocyclic antidepressant)
- Seizures (amphetamine, cocaine, ibuprofen >400mg/kg)
- Petroleum distillate
- Infant <6 months age
- Prior significant vomiting or hematemesis
- Absence of bowel sound.
- Special situations (late pregnancy, elderly, HTN)

GASTRIC LAVAGE

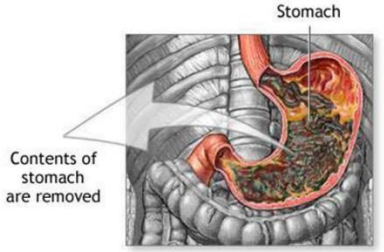
ما بزبط يكون غسيل المعده اشي روتيني اذا كان في علاج احسن وطبعا يكون مفعول الغسيل احسن اذا كان خلال ساعه وكل ما زاد الوقت يقل فعاليته

اذا كان الواحد ماخذ anti col يكون فعال خلال عده ساعات لانو حكينا تعمل وقف لحركه الأمعاء
ولما بدي اعمل غسيل لللمعده بخلي المريض يلف على طرفه السيار عشان شكل المعده

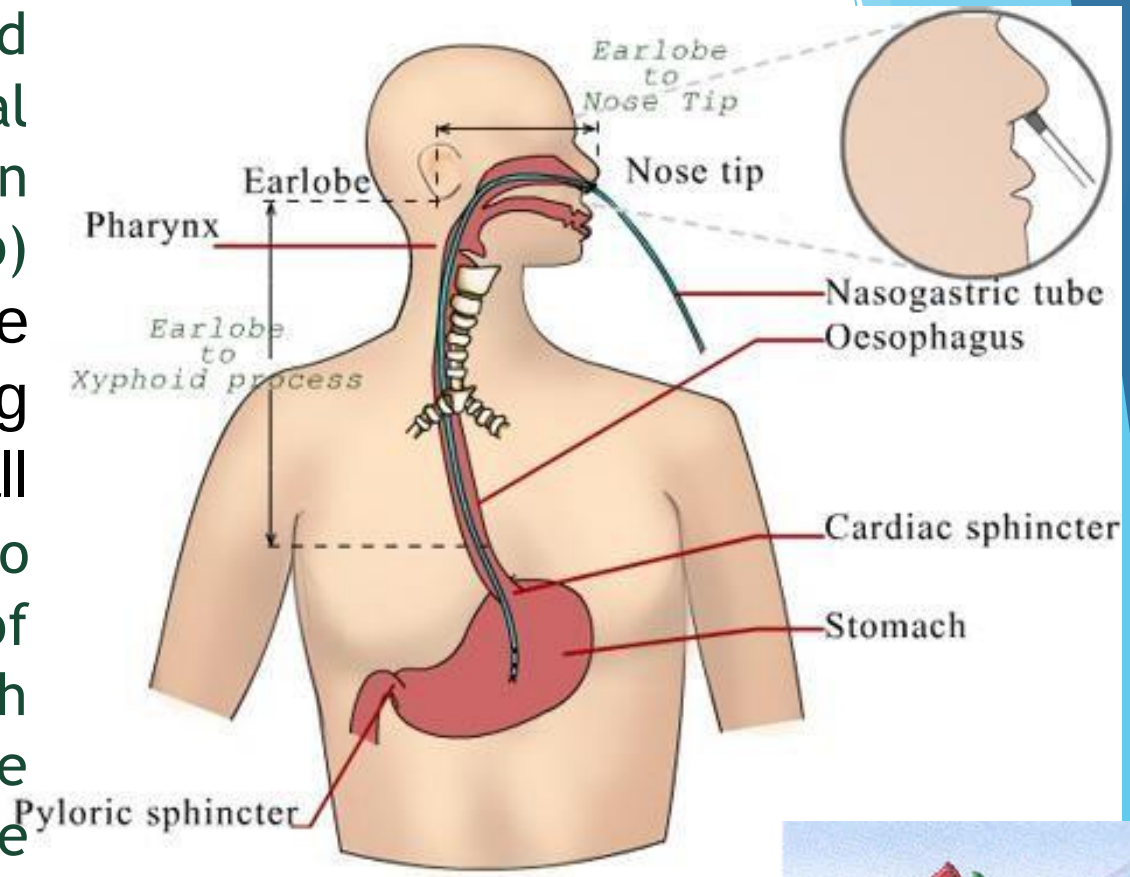
- Process of washing out the stomach

with various solutions including lukewarm water, saline, sodium bicarb.

- Gastric lavage **should not be employed routinely**, if ever, in the management of poisoned patients
- Effective **within 30-60 minutes of the ingestion…. Usefulness decreases with time**
- Still useful several hours after ingestion of agents that slow gastric emptying (eg. anticholinergic drugs)



The patient is placed on the left lateral decubitus position (pylorus pointed up) to reduces the chance for emptying into the small intestine and to permit pooling of gastric contents with head lower than the rest of the body. The largest catheter is inserted into the stomach



GASTRIC LAVAGE

هسا بيحكو بعد غسيل المعده بدخل للمعده هلقد كميه من الماء حسب العمر حتى يصبح خالي من السموم

- Attempt to aspirate as much of the stomach content as possible then…
- Lavage fluids should be introduced into the stomach (50-100ml aliquots for children) and (200- to 300-ml aliquots for adults)
- Lavage till clear
- **Complication** (3%) aspiration pneumonia, esophageal perforation, electrolyte imbalance
- **Advantages**: prepare the stomach for endoscopy

GASTRIC LAVAGE

ما بعطيه لواحد مش واعي ولا لواحد عمره اقل من سنتين وما بزبط لناس ماخذه ادويه حجمها كبير
وبزبط يوخذ antidote

- Do not perform in any patient with an **impaired level of consciousness** unless the airway is protected by a cuffed endotracheal tube….prevent aspiration
- In patients < 2 years.
- Do not perform if ingestion of tablets (especially big in size)
- A specific antidote is then given if available; otherwise, a slurry of activated charcoal is given

GASTRIC LAVAGE

- **CONTRAINDICATION:**

لازم يكون محمي حتى امنع عوده الي بسحبه للمجرى التنفسي

- **Unprotected airway**
- **Caustic ingestion** (due to risk of exacerbating any esophageal or gastric injury)
- **Hydrocarbon ingestion** (due to high aspiration risk)

المواد الكاويه عشان هو انحرق المريء أصلا لما شربهم هل برجعهم للمريء مره ثانيه وبرجع احرق المحروق طبعا لا

- Patients at risk of **GI hemorrhage** or **perforation** (recent surgery, underlying anatomic abnormality or pathology, coagulopathy)

ACTIVATED CHARCOAL

- ✓ Is a highly adsorbent powdered material produced by the superheating of wood pulp
- ✓ Form of carbon that has been processed in order to make it very porous with a **large surface area** to adsorb chemicals
- ✓ ……it is highly effective in adsorbing most toxins when given in a ratio of approximately 10 to 1 (charcoal to toxin)
- ✓ Only a few toxins are poorly adsorbed to charcoal and in some cases this requires a higher ratio (eg, for cyanide a ratio of about 100:1 is necessary)

ACTIVATED CHARCOAL

- ✓ Indications: whenever an emetic cannot be used, following successful chemical induction of emesis, or when the patient is unconscious
- ✓ Give activated charcoal aqueous suspension orally or by gastric tube. Initial dose (1 g/kg)
- ✓ Then 0.5g/kg every 2-6hrs

ACTIVATED CHARCOAL

- ✓ Within 30min of ingestion
- ✓ Should not be given within 30 min of syrup of ipecac unless the victim has already vomited (adsorbed on charcoal)
- ✓ In the stomach and intestine, poisons diffuse through the numerous pores on the charcoal surface and form tight chemical bonds
- ✓ This charcoal-chemical complex then passess out of the body
- ✓ **Risk**: pulmonary aspiration due to loss of airway reflex

Substances poorly adsorbed by activated charcoal

- Alkali
- Iron
- Lithium
- Ethylene glycol
- Mineral acids
- Fluoride
- Potassium
- Heavy metals
- Cyanide*

ACTIVATED CHARCOAL

- **CONTRAINDICATION:**
  - ✓ Absence of bowel sounds
  - ✓ Sign of intestinal obstruction
  - ✓ Lack of airway protection
  - ❖ May decrease the absorption of the antidote given later

اخذ فحم تمام ولكن ضل بالمعده لان فش فيها حركه

اذا بعطي الفحم وبعده بعطي antidote
هون لازم احسب حساب مين فيهم more activeلانو
بهاي الحاله رح اعطي الاحسن طبعا مش شرط مع
بعض وبرضو يعتمد على الكميه

Decontamination

- Gastric decontamination *(decrease absorption)*
  - Dilution
  - Emesis
  - Gastric lavage
  - Activated charcoal
  - Cathartics
  - Whole bowel irrigation

المسهلات

Cathartics

Cathartics — (eg, **magnesium citrate, magnesium sulfate, sorbitol, mannitol**) are intended to decrease poison absorption by enhancing **rectal evacuation of toxins or the poison-AC complex.**

Toxicologists advise against the use of cathartics as single-agent therapy.

The combination of a cathartic and AC (eg, sorbitol and AC) should be used sparingly in adults, if at all, and should not be used in children.

If the only available formulation of AC contains sorbitol, it may be necessary to give it to a child, but treatment must be limited to a single dose in such cases

Cathartics

Adverse effects associated with cathartic use include:

- increased abdominal pain,
- nausea,
- vomiting,
- excessive diarrhea,
- dehydration, and
- electrolyte abnormalities.

Decontamination

- Gastric decontamination *(decrease absorption)*
  - Dilution
  - Emesis
  - Gastric lavage
  - Activated charcoal
  - Cathartics
  - Whole bowel irrigation

Whole Bowel Irrigation

الفكره بشكل عام بزيد
electrolyteمع المسهل
وبعطيه بكميات كبيره حتى
بنظف القولون

- **WBI**: aggressive form of GIT decontamination attempt to cleanse the bowel by the enteral administration of **large volume of an osmotically balanced nonabsorbable polyethylene glycol electrolyte solution** (PEG-ES) which induces a liquid stool

- Contains the osmotically active sugar (PEG) with sodium sulfate, sodium chloride, sodium bicarb and potassium chloride to maintain electrolyte balance

Whole Bowel Irrigation

- Rarely performed because risk-benefit analysis reserves this intervention for **life-threatening indication:**
  - Ingestion of sustained-release or enteric coated preparations (valproic acid, verapamil or diltiazem)
  - Agent that do not bind to charcoal (iron, other heavy metals, lithium)
  - Ingestion of illicit drug packets
  - No good clinical outcome is expected with antidote administration and the patient presents before established severe toxicity

لما نحكي عن هدول افضل هاي الطريقه
لتخلص بسرعه منهم لانهم بغلبو

Complications such as: N, V

وبرضو استخدمه
لناس الي ينقلو
المخدرات من بلد لبلد

Contraindications

- Ileus, bowel obstruction, or intestinal perforation
- Clinically significant **GI hemorrhage**
- **Hemodynamic instability** (concern for sequestration of bowel and worsening of shock)
- Intractable **emesis**

Table 5 *Gastrointestinal Decontamination*

Method	Advantages or Disadvantages	Uses
Syrup of ipecac	Typically induces vomiting within 20 min. Effectiveness questionable if given more than 30-60 min after ingestion. Vomiting may delay administration of activated charcoal and in an obtunded patient may lead to pulmonary aspiration of gastric contents.	Limited to use at home in children discovered within a few minutes of selected ingestion. Should not be given if the child has ingested a corrosive agent, most hydrocarbons, or if the child is drowsy.
Gastric lavage	May be performed without delay or patient cooperation. Decompresses the stomach, reducing the risk of vomiting and aspiration. Efficacy questionable if initiated more than 1 hour following ingestion. Not likely to remove intact pills, especially sustained-release products.	Rapid removal of recently ingested liquids; decompression of distended stomach; ingestion of massive quantities of drug, especially if the drug delays gastric emptying *(eg,* aspirin, anticholinergics).

Gastrointestinal decontamination

Activated charcoal (AC)	A highly refined powdered charcoal with enormous surface area, can adsorb most drugs and toxins. Ideal ratio of AC to drug is about 10:1 by weight. Ineffective for lithium, iron, other highly polar or low molecular weight substances	Administer AC alone in uncomplicated oral ingestions. Obtunded patients may be given the AC by nasogastric tube after gastric decompression and suctioning; cathartic may hasten gut transport and elimination
Whole-bowel irrigation	Balanced electrolyte-polyethylene glycol solution is iso-osmotic, can flush out gut contents without significant fluid shifts or electrolyte changes. May be mixed with AC if poison suspected to be adsorbed.	Ideal for ingestions of iron, lithium, sustained-release products, drug or poison-filled packets or other foreign bodies.