การวินิจฉัยและรักษาผู้ป่วยได้รับสารพิษ

The number of interlocutors consulted to Ramathibodi Poison Center during 1996 - 2009
Professional of the interlocutors who called the Ramathibodi Poison center in 2001-2006

- Physicians: 91%
- Medical students: 6%
- Nurses: 1%
- Other: 1%

Regions of the interlocutors who called the Ramathibodi Poison center in 2001-2006

- Central (Bangkok): 23.32%
- Central: 27.38%
- North-Eastern: 20.19%
- Eastern: 11.35%
- Western: 4.32%
- Southern: 8.17%
- Foreign countries: 0.03%
- Northern: 5.24%
- Other: 1%
- General population: 1%
Substances involved in human poisoning in Thailand

1. Agropesticides
2. Household products
3. Medical products
4. Technical and occupational products
5. Poisonous animals and plants

Category of substances most frequently involved in human exposure in Thailand (2001-2006: Ramathibodi Poison Center)
How to diagnose poisoning in unknown subjects?

Diagnosis of unknown poisoning

1. Awareness
2. Multiple cases
3. Toxic syndromes
   - Onset
   - Clinical characteristics
   - Severity
4. Poison
   - Type
   - Dose
   - Delivery
   - Timing
   - Laboratory
5. No alternative diagnosis
Poisoning

Etiologic diagnosis
Causal relationship

Laboratory

Aim
To confirm diagnosis
To rule out other diagnosis

Measurement
Poison/metabolites
Surrogates
Techniques

Spectrophotometry
Immunoassay
Gas chromatography
High pressure liquid chromatography
Mass spectrometry
Syrup of ipecac

Indications

1. Not administered routinely in poisoned patients, only in an alert patient who has ingested a potentially toxic amount.
2. Only if it can be administered within 60 minutes of the ingestion.

Dosage

15–30 mL followed immediately by 240 mL of water.

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American Academy of Clinical Toxicology
European Association of Poisons Centres and Clinical Toxicologists
Syrup of ipecac

Contraindications

1. Compromised airway reflexes including coma and convulsions
2. Substance that compromise airway reflexes and the need for advanced life support within 60 minutes
3. Hydrocarbons with high aspiration potential.
4. Corrosive substance, such as an alkali or strong acid.
5. Debilitated, elderly patients or medical conditions further compromised by the induction of emesis.

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American Academy of Clinical Toxicology
European Association of Poisons Centres and Clinical Toxicologists

Syrup of ipecac

Complications

Diarrhea
Lethargy/drowsiness
Prolonged vomiting >1 hour

Position Paper 2004
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European Association of Poisons Centres and Clinical Toxicologists
Gastric lavage

Indications

Not performed routinely, if ever.

Clinical studies have not confirmed the benefit even when it was performed less than 60 minutes after poison ingestion.

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Gastric lavage

Contraindications

Loss of airway protective reflexes, such as in a patient with a depressed state of consciousness, unless intubated tracheally.

Ingestion of a corrosive substance such as a strong acid or alkali.

Ingestion of a hydrocarbon with high aspiration potential.

Patients who are at risk of hemorrhage or gastrointestinal perforation due to pathology, recent surgery, or other medical condition such as coagulopathy.

Position Paper 2004
American Academy of Clinical Toxicology
European Association of Poisons Centres and Clinical Toxicologists
Gastric lavage

Complications

Aspiration pneumonia
Perforation of the esophagus
Laryngospasm
Hypoxia
Cardiac dysrhythmias
Fluid and electrolyte imbalance

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Single dose activated charcoal

Indications

Benefit if administered within one hour of poison ingestion

Questionable clinical importance when charcoal is administered at times greater than one hour.
The potential for benefit after one hour can not be excluded.

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European Association of Poisons Centres and Clinical Toxicologists
Single dose activated charcoal

Dosage Regimen

Adolescents and adults: 25 to 100 g

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Contraindications

If the patient has an unprotected airway, such as in a patient with a depressed state of consciousness without endotracheal intubation.

If its use increases the risk and severity of aspiration (e.g., a hydrocarbon with a high aspiration potential).

Patients who are at risk of hemorrhage or gastrointestinal perforation

The presence of activated charcoal in the gastrointestinal tract may obscure endoscopic visualization

Corrosive is not an absolute contraindication when charcoal is used for co-ingested agents that are systemic toxins.

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Single dose activated charcoal

Complications

Few reports of adverse effects. There are no reports of gastrointestinal obstruction, constipation or hemorrhagic rectal ulceration.

The majority of adverse events are not related to the appropriate use of activated charcoal, but are a complication of aspiration or the direct administration of charcoal into the lung.

Aspiration of charcoal containing povidone has led occasionally to major respiratory problems.

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Multi dose activated charcoal

Indications

If the patient has ingested a lifethreatening amount of

- Carbamazepine
- Dapsone
- Phenobarbital
- Quinine
- Theophylline

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Multi dose activated charcoal

Indications

The ultimate decision to use multiple-dose activated charcoal therapy depends on:

(a) the physician’s clinical judgment regarding the expected outcome in a patient poisoned with carbamazepine, dapsone, phenobarbital, quinine, or theophylline
(b) the presence of a contraindication to the use of activated charcoal therapy
(c) the effectiveness of alternative methods of treatment.

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Multi dose activated charcoal

Dosage Regimen

Initial dose of 50-100 g to an adult, at a rate of not less than 12.5 g/h or equivalent.

Activated charcoal should be continued until the patient’s condition and laboratory parameters, including plasma drug concentration, are improving.

Activated charcoal may induce vomiting such as occurs with theophylline in overdose. Smaller doses administered more frequently may reduce vomiting. However, it is often necessary to give an antiemetic intravenously.
Multi dose activated charcoal

Co-administration of a cathartic

The need for concurrent administration of a cathartic, such as sorbitol, is not recommended.

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Multi-Dose Activated Charcoal

Contraindications

Absolute

An unprotected airway
Presence of intestinal obstruction
A gastrointestinal tract not anatomically intact

Relative

Decreased peristalsis such as occurs following overdoses of drugs with opioid or anticholinergic properties.
If administered, be careful to monitor for the development of obstruction and for the prevention of aspiration.

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Multi-Dose Activated Charcoal
Multi-Dose Activated Charcoal

Complications

Relatively free from serious side-effects, although transient constipation may occur.

Occasionally, bowel obstruction has been reported necessitating manual evacuation or surgical intervention.

Regurgitation, with subsequent aspiration into the lungs of gastric contents containing charcoal, or direct installation of charcoal into the lungs as a result of a misplaced nasogastric tube, has led rarely to severe pulmonary complications and death.

Emesis of aqueous activated charcoal occurs infrequently. The incidence appears to be greater when activated charcoal is administered with sorbitol.

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Cathartics

Indications

Based on available data, there are no definite indications for the use of cathartics in the management of the poisoned patient.

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Cathartics

Contraindications

- Absent bowel sounds, recent abdominal trauma, recent bowel surgery, intestinal obstruction, or intestinal perforation.
- Ingestion of a corrosive substance.
- Volume depletion, hypotension, or significant electrolyte imbalance.
- Magnesium cathartics should not be given to patients with renal failure, renal insufficiency, or heart block.
- Cathartics should be administered cautiously to the very young (<1 year of age) and to the very old.

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Cathartics

Complications

- Single Dose
  - Nausea, abdominal cramps, vomiting.
  - Transient hypotension.

- Multiple or Excessive Doses
  - Dehydration.
  - Hypernatremia in patients receiving sodium-containing cathartics.
  - Hypermagnesemia in patients receiving a magnesium containing cathartic.

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Cathartics

The two general types of osmotic cathartics used in poisoned patients

Saccharide cathartics (sorbitol)
Saline cathartics (magnesium citrate, magnesium sulfate, sodium sulfate).

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Urine alkalinization

Procedure

Achieving alkalinization
In an adult, give sodium bicarbonate 225 mmol (225 mL of an 8.4% solution) intravenously over 1h

Maintaining urine alkalinization
Give additional boluses of intravenous sodium bicarbonate to maintain urine pH in the range 7.5-8.5

Monitor
- Urine pH every 15-30 min until urine pH is in the range 7.5-8.5, then hourly
- Plasma potassium hourly
- Central venous pressure hourly
- Acid-base status hourly. (arterial pH not exceed 7.50)
- Urine output not exceed 100-200 mL/h

Discontinue urine alkalinization
When plasma salicylate concentrations fall below 350 mg/L in an adult

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Urine alkalinization

Definition
Urine alkalinization is to increase poison elimination by the administration of intravenous sodium bicarbonate to produce urine with a pH > 7.5.

The term urine alkalinization emphasizes that urine pH manipulation rather than a diuresis is the prime objective of treatment; the terms forced alkaline diuresis and alkaline diuresis should therefore be discontinued.

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Complications

Severe Alkalemia
Hypokalemia
Hypocalcemia
Coronary Vasoconstriction
Cerebral Vasoconstriction

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Urine alkalinization

Urine alkalinization increases the urine elimination of

- Chlorpropamide
- 2,4-dichlorophenoxyacetic acid
- Diflunisal
- Fluoride
- Mecoprop
- Methotrexate
- Phenobarbital
- Salicylate.

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Urine alkalinization

First line treatment in patients with moderately severe salicylate poisoning who do not meet the criteria for hemodialysis.

Urine alkalinization and high urine flow (approximately 600 mL/h) should also be considered in patients with severe 2,4-dichlorophenoxyacetic acid and mecoprop poisoning.

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Urine alkalinization

Contraindications
Established or incipient renal failure is a contraindication
Significant preexisting heart disease is a relative contraindication.

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Whole bowel irrigation

Rationale

Whole bowel irrigation (WBI) cleanses the bowel by the enteral administration of large amounts of an osmotically balanced polyethylene glycol electrolyte solution (PEG-ES) which induces a liquid stool.

WBI reduces drug absorption by decontaminating the entire gastrointestinal tract by physically expelling intraluminal contents.

Polyethylene glycol and electrolytes in PEG-ES causes no net absorption or secretion of ions, so no significant changes in water or electrolyte balance occur.

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European Association of Poisons Centres and Clinical Toxicologists
Whole bowel irrigation

Indications

WBI should not be used routinely, but could have potential value in a limited number of toxic ingestions

- Sustained-release or enteric-coated drugs
- Iron
- Removal of ingested packets of illicit drugs.

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Whole bowel irrigation

Dosage Regimens

WBI fluid is best administered through a nasogastric tube.
Adolescents and adults: 1500–2000 mL/h
WBI should be continued until
  - the rectal effluent is clear
  - X-rays, no toxins appeared

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Whole bowel irrigation

Contraindications
- Bowel perforation
- Bowel obstruction
- Clinically significant gastrointestinal hemorrhage.
- Ileus
- Unprotected or compromised airway
- Hemodynamic instability
- Uncontrollable intractable vomiting

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Whole bowel irrigation

Complications

Nausea, vomiting, abdominal cramps, and bloating
Patients with compromised and unprotected airways are at risk for pulmonary aspiration during WBI.

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