

- Endogenous and exogenous opiates produce their effects by binding at one or more opiate receptors.
- Naloxone, nalmefene, and naltrexone are competitive opioid antagonists that bind at the mu (μ), kappa (κ), and delta (δ) receptors and competitively prevent the binding of endogenous and exogenous opiates at these receptors.
- Naloxone may be administered by intravenous, intramuscular, intratracheal, or sublingual routes.
- After intravenous administration, naloxone rapidly enters the central nervous system (CNS). In patients with opiate poisoning, consciousness is restored and respiration improved within 1 to 2 minutes. Meiosis, inhibition of baroreceptor reflexes, laryngospasm, and decreased gastrointestinal motility are also reversed.
- The duration of action of naloxone is 15 to 90 minutes. Its clinical effects depend on the dose and route of naloxone administration as well as the dose and rate of elimination of the opiate agonist.
- Certain nonopiate drugs can cause release of endogenous opiates, contributing to CNS and respiratory depression as well as hypotension. Alternatively, nonopiate drugs and naloxone may compete for an unidentified nonopiate receptor that contributes to CNS depression and hypotension.
- Naloxone may reverse the toxicity caused by such drugs as clonidine, angiotensin-converting enzyme inhibitors, and sodium valproate.
- Large doses of naloxone may be necessary to reverse the effects of nonopiate drugs or of opiate drugs with high affinity for the δ and κ opiate receptors.
 - If respiratory depression returns, the initial dose of naloxone may need to be repeated or a constant infusion of naloxone initiated.
 - The starting dose for a constant infusion of naloxone is hourly administration of about one half to two thirds of the bolus dose that reversed the opiate effects.

naloxone

- Flumazenil competitively antagonizes the pharmacologic effects of drugs that act on the benzodiazepine receptor.
- Flumazenil also antagonizes the sedative effects of drugs other than benzodiazepines, such as cannabis, ethanol, promethazine, chlorzoxazone, and carisoprodol.
- Flumazenil administration may precipitate seizures in patients with an overdose who have a history of coingestion of a benzodiazepine and a proconvulsant drug, a history of seizures, chronic benzodiazepine ingestion, a history of head injury, or ingestion of only a proconvulsant drug.
- Administration of flumazenil to the patient with an overdose should be limited to the following situations:
 - iatrogenic overdose with known patient history;
 - obtundation in a toddler secondary to ingestion of benzodiazepine, and
 - reversal of a paradoxical response to benzodiazepine.

flumazenil

- Physostigmine inhibits acetylcholinesterase, the enzyme responsible for the metabolism of acetylcholine (ACH).
- In the poisoned patient, physostigmine is most frequently administered to treat anticholinergic toxicity. Clinical signs of anticholinergic toxicity are recognized by the pneumonic "Blind as a bat, Red as a beet, Hot as a hare, Dry as a bone, Mad as a hatter."
- Physostigmine administration may be considered if life-threatening clinical signs of anticholinergic peripheral effects (hypertension, tachycardia, and seizures) or central effects (painful psychosis) are present. However, it is extremely difficult to balance cholinergic and anticholinergic forces.

physostigmine

- Complications of cholinergic crises (caused by excess physostigmine) include hypertension, arrhythmia, asystole, bronchorrhea, bronchoconstriction, seizures, and status epilepticus
- Contraindications to physostigmine administration include reactive airway disease, peripheral vascular disease, intestinal or bladder obstruction, and treatment with a depolarizing neuromuscular blocking agent (e.g., succinylcholine).
- An acceptable dose of physostigmine is 2 mg intravenously over 10 minutes.

antidotes

general

Beta blockers	Glucagon
Benzodiazepines	Flumazenil
Calcium channel blockers	CaCl ₂
CO	Oxygen
Cholinergics	Atropine
Chloroquine	Diazepam
Clonidine	Naloxone
Cyanide	Amylnitrate+sodium nitrate+sodium thio sulphate, dicobalt edetate, hydroxocobalamin
Digoxin	Specific Fabs
Ethylene glycol	Ethanol or 4-methylpyrazole
Fluoride	Calcium gluconate
Hydrofluoric acid	Caclium gluconate
Heparin	Protamine
Iron	Desferrioxamine
Isoniazid	Pyridoxine
metHb	Methylene blue
Methotrexate	Folinic acid
Narcotics	Naloxone
Organophosphates	Atropine, pralidoxime
Paracetamol	N-acetylcysteine
TCA's	Alkalinisation
Lead	Dimercaprol

dextrose

- Up to 8% of patients with altered mental status are hypoglycemic.
- Hypoglycemia may be a result of the drug or toxin exposure, nutritional deprivation, or a medical complication (e.g., sepsis, hyperthermia).
- Glucose should be checked at the bedside for all patients with altered mental status.