# OPIOID TOXIDROME

## Introduction

**Opioid toxidrome presents with a classical triad of:**

- **Pinpoint pupils**
- **Depressed conscious state**
- **Depressed respiratory state**

The toxidrome is critical to recognize as it represent a potentially lethal syndrome

Opioid poisoning is the leading cause of death by poisoning in children

All opioids are reversed to variable degrees by naloxone, but good outcomes can still be achieved by good supportive care, in particular with regard to the airway and ventilation.

See also separate guidelines on:

- **Opioid overdose**
- **Heroin overdose**
- **Suboxone overdose.**

### *Opioid agents*

There are a wide range of agents currently available, the most common currently in use in Australia include:

- Morphine
- Fentanyl
- Codeine
- Oxycodone
- Buprenorphine and Suboxone (a combination agent consisting of Buprenorphine and naloxone)

- Hydromorphone
- Methadone
- Sufentanil
- Tramadol
- Pethidine
- Dextropropoxyphene

## Pharmacodynamics [1]

Opioids interact with one or more subtypes of opioid receptors (eg mu, kappa, delta) at supraspinal, spinal and peripheral sites to produce analgesia and a multitude of other effects.

Current potent opioid analgesics are mu agonists, although specific delta and kappa agonists may also produce analgesia. Evidence suggests that these opioid receptors exist as heterodimers, which respond in complex ways to combinations of drugs.

Opioids act by causing presynaptic inhibition of neurotransmitter release from C-fibre terminals, postsynaptic inhibition of evoked activity in nociceptive pathways, or disinhibition of other circuits regulating nociceptive transmission. Supraspinal opioids increase descending inhibition of spinal nociceptive transmission.

Opioid analgesics may be pure agonists of specific opioid receptors (notably the mu receptor), mixed agonist–antagonist drugs with opposing effects at distinct receptor subtypes, or partial mu agonists. No ceiling effect to analgesia is found with the pure agonists, in contrast to the partial agonist and mixed agonist - antagonist opioids.

Opioids can block all forms of pain, not just pain arising from tissue damage and inflammatory processes. The normal clinical doses used also dampen the patient's emotional response to the pain, perhaps more effectively than blocking the pain (i.e. pain may still be noted by patients but they can tolerate it or cope with it better).

## Clinical Features

The classic triad of features of opioid overdose includes:

- **Pinpoint pupils.**
- **Depressed conscious state.**
- **Depressed respiratory function.**

- ♥ **Always assess the respiratory rate in the *undisturbed* patient - if the patient is woken up first this can result in a significant *underestimation* of the severity of an opioid toxidrome.**

In addition to the above, in the case of heroin addicts, evidence of recent **venepuncture** or of older thrombosed veins will often also be found.

*Complications:*

The principle causes of death due to opioids will be:

- Airway obstruction
- Respiratory arrest
- Hypoxic brain injury.

*Less commonly:*

- Effects of prolonged immobilization: rhabdomyolysis / hypothermia / dehydration

## Investigations

There are no specific investigations required.

Any that are done will be directed toward the exclusion other causes of the symptoms observed or at the secondary complications of the syndrome itself.

## Management

In general terms:

1. ABC issues:
   - The immediate priority to the patient is attention to ABC issues.
   - **Patients with pure opioid toxicity respond well to supportive bag-valve-mask ventilation measures.**
2. Charcoal:
   - Activated charcoal is *not* indicated, because of the risk of aspiration in those with a reduced conscious state and because good supportive care and Naloxone will ensure a good outcome.
3. Naloxone (trade name Narcan):

   The need for naloxone will be determined by how unwell the patient is.

**It does not have to be given in mild cases but it must be given in cases of severe depression of consciousness and/or respiratory status.**

If there is a failure of response to naloxone, think of:

- Possibility of underdosing with naloxone
- Possibility of co-ingestants
- Possibility of secondary cerebral hypoxia and/or traumatic head injury.
- Other alternative diagnoses.

*References*


1. Toxicology and Wilderness Therapeutic Guidelines, 2nd ed 2012 & eTG March 2013.
2. Opioid overdose in L Murray et al. Toxicology Handbook 2nd ed 2011.
3. Naloxone in L Murray et al. Toxicology Handbook 2nd ed 2011.



Dr J. Hayes
July 2013