### Amphetamines and Amphetamine-type substances (includes ‘ice’, MDMA/ecstasy)

Amphetamines can produce life threatening hyperthermia + neurological, cardiovascular, and metabolic toxicity.

### Toxicity / Risk Assessment

*Exposure = dose-dependent sympathomimetic stimulation*

**Clinical features:**
- Clinical effects of amphetamines occur rapidly
- **CNS:** Anxiety, agitation, aggression, euphoria, seizures
- **CVS:** ↑HR+BP, arrhythmias, aortic dissection, pulmonary oedema, acute coronary syndrome (ACS) - *is most likely secondary to vasospasm, not thrombosis*
- **Excited Delirium:** (delirium, psychomotor agitation, marked physiological excitation) = **medical emergency**
- **SIADH** (Syndrome of Inappropriate Anti-Diuretic Hormone): substituted amphetamines including MDMA / Ecstasy can cause SIADH, increasing the likelihood of hyponatraemia
- **Other:** Diaphoresis, tremor, hyperthermia, ischaemic colitis, intracranial haemorrhage, rhabdomyolysis

### Management

- There is no role for administration of activated charcoal
- **Rapid titration of benzodiazepines (and rapid cooling) is the mainstay of treatment.**
  - Diazepam 5-10 mg IV every 5-10 mins to achieve sedation; less severe cases: use oral diazepam q30 mins
  - **Agitation and Excited Delirium** – *treat aggressively as extreme catecholamine excess can lead to death*
    - Droperidol 10 mg IM / 2.5-10 mg IV initially. Continued agitation or delirium may require Rx with droperidol 5 mg increments / titrated doses of diazepam / or GA sedation (seek expert advice)
  - **Hypertension/Tachycardia** – *Beta-blockers are contra-indicated*
    - Diazepam sedation, GTN infusion as per ACS protocol, calcium channel antagonist (seek expert advice)
  - **Acute Coronary Syndrome**
    - Aspirin, GTN, proceed to coronary angiography to identify thrombosis vs. coronary artery spasm
  - **Hyperthermia** - *treat aggressively as temperatures > 40°C can rapidly lead to death*
    - Active cooling measures (fanning, tepid sponging, ice axilla/groin), sedation/paralysis/intubation
  - **Continued seizures or altered mental status** – *exclude hyponatraemia early*
    - Check sodium concentration for possible hyponatraemia (treat as below). CT brain
    - No role for phenytoin. General anesthetic sediment with thiopentone, propofol or midazolam
  - **Hyponatraemia** - *beware hyponatraemia secondary to SIADH +/- excess H2O intake*
    - Euvolaemic fluid overload: fluid restrict. If Na+ conc. < 120 mmol/L, consider 3% NaCl (1-2 mL/kg IV)
  - **Investigations – ECG / electrolytes**
    - Additional investigations based on clinical findings: troponin / PCI / CT brain / angiography