

Cyanide

(Includes Cyanide and any Cyanogenic Compound, i.e. acetonitrile)

UNYPCC Management Guideline

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Home Management

- There is no acceptable dose that can be managed at home
- Any exposure requires transport to the hospital via EMS

A consultant should be immediately notified of any patient with a known cyanide exposure or in a patient with suspicion of cyanide toxicity (eg: Unexplained, sudden cardiovascular collapse)

Gastrointestinal Decontamination

- Activated Charcoal 1 g/kg should be considered in patients with ingestion of cyanide salts

Laboratory Tests

- Basic Metabolic Profile
- Arterial Blood Gas
- Serum Lactate (lactate > 8 mmol/L indicative of cyanide exposure)
- Cyanide levels are send-outs and not of any clinical value when acutely managing patients

Treatment

- Cyanide should be considered in any patient with rapid cardiovascular collapse that is unresponsive to standard supportive care and antidotal therapy should be recommended immediately
- Cyanide should be considered in any **fire victim** that is hemodynamically unstable despite supplemental oxygen, or with a lactic acidosis
- IV Normal Saline
- Hydroxocobolamin (Cyanokit^(R))
 - Adult: 5 grams IV over 15 minutes; can be repeated ONCE
 - Pediatric: 70 mg/kg IV over 15 minutes; can be repeated ONCE
- Sodium thiosulfate
 - Adult: 50 mL of 25% solution IV (12.5 grams IV); can be given via IV bolus or infused over 10-20 minutes; if necessary, half of the dose can be

- repeated
- Pediatric: 2 mL/kg of 25% solution IV (up to adult dose); can be given via IV bolus or infused over 10-20 minutes can be repeated; if necessary, half of the dose can be repeated
- Amyl/Sodium Nitrite (**NOT to be given in house fire victims or in other scenarios of concomitant carbon monoxide poisoning**):
 - Amyl Nitrite: One ampule (0.3 mL) inhaled until IV access obtained
 - Sodium Nitrite:
 - Adult: 300 mg (10 mL of 3%) over 2-4 minutes
 - Pediatric: 0.2 mL/kg of 3% (6 mg/kg) over 2-4 minutes (up to the adult dose)

{Cyanokit^(R) is the brand name for hydroxocobolamin}

{Nithiodote^(R) is the brand name for a Cyanide antidote kit that contains 1 vial of Sodium Nitrite (300 mg) and 1 vial of Sodium Thiosulfate (12.5 grams)}

Prevention of Nitroprusside Induced Cyanide Toxicity

- Nitroprusside is used in the management of malignant hypertension and each molecule is broken down into 5 cyanide molecules
- To prevent cyanide toxicity, either sodium thiosulfate or hydroxocobolamin has been used (most facilities use sodium thiosulfate)
 - Sodium thiosulfate: For every 100 mg of nitroprusside, 1 gram of sodium thiosulfate is added directly to the nitroprusside infusion
 - Hydroxocobolamin: 100 mg hydroxocobalamin in 100 mL D5W infused at 25 mg/hour; this is a separate infusion than the nitroprusside and should be infused in a different line. Hydroxocobolamin should be continued for 10 hours after the nitroprusside has been discontinued.
 - This should only be done if the patient is demonstrating signs of thiocyanate toxicity. (Sodium thiosulfate is the preferred agent to prevent CN toxicity and should be used empirically)
 - Sodium thiocyanate is renally eliminated and in patients with oliguric renal insufficiency, hydroxocobalamin may be the preferred agent during a prolonged nitroprusside infusion

References:

[Shepherd et al. Role of hydroxocobolamin in acute cyanide poisoning](#)
[Borron et al Hydroxocobolamin for severe cyanide poisoning](#)
[Antidotes for Toxicologic Use](#)