Cyanide Exposure
Supplement Protocol for use of Cyanokit® (Hydroxocobalamin)

NOTE: This protocol is a supplement to the Michigan CBRNE Protocol for Cyanide Exposure and is intended exclusively for use by Paramedics. The Cyanide Exposure Protocol should be followed. This protocol provides direction for use of Cyanokit® (hydroxocobalamin), when available, as an alternative antidote to sodium nitrite and sodium thiosulfate.

Indications:
The Cyanokit® is indicated for the treatment of known or suspected cyanide poisoning. If clinical suspicion of cyanide poisoning is high, Cyanokit® should be administered without delay. Note, patients experiencing serious symptoms from smoke inhalation, particularly when in a confined space exposure (inside a house fire,) frequently have cyanide exposure with or without carbon monoxide exposure and should be considered for the Cyanokit®.

PARAMEDIC

1. Continue all non-pharmacologic treatment called for under the **Cyanide Exposure Protocol**.
2. Cyanokit®: If available and cyanide exposure confirmed **OR SUSPECTED** and with medical control order* for critical patients:
   A. The Cyanokit® is packaged in two ways:
      a. A **two vial kit** with 2.5g of hydroxocobalamin each in powder form which must be reconstituted with 100mL of normal saline each, rotated or tipped for 30 seconds each (not shaken) and then administered through its own IV line (not used with any other medications) over 7.5 minutes each.
      b. A **one vial kit** with 5g of hydroxocobalamin powder which must be reconstituted with 200mL of normal saline, be rotated or tipped for 60 seconds (not shaken) and administered through its own IV line (not used with any other medication) over 15 minutes.
   B. The starting dose of hydroxocobalamin for adults is 5g (i.e., two 2.5g vials OR one 5g vial) administered as an intravenous (IV) infusion over 15 minutes. See charts below for pediatric dosing.

Two Vial Kit (2.5g/100mL):

AGE GROUP	AMOUNT	DOSAGE
Infant/Toddler (0-2 years)	¼ bottle	0.625g
Preschool (3-5 years)	½ bottle	1.25g
Grade School (6-13 years)	1 bottle	2.5g
Adult ≥ 14 years	2 bottles (entire kit)	5g

One Vial Kit (5g/200mL):

AGE GROUP	AMOUNT	DOSAGE
Infant/Toddler (0-2 years)	⅛ bottle	0.625g
Preschool (3-5 years)	¼ bottle	1.25g
Grade School (6-13 years)	½ bottle	2.5g
Adult ≥ 14 years	1 bottle (entire kit)	5g

C. Each vial of hydroxocobalamin for injection is to be reconstituted with diluent (not provided with Cyanokit®) using the supplied sterile transfer spike.
    a. The recommended diluent is 0.9% Sodium Chloride injection (0.9% NaCl).
        i. Alternate solutions for dilution if NaCl not available:
            1. Lactated Ringers injection
            2. 5% Dextrose injection (D5W)
    b. The line on each vial label represents the volume of diluent. Following the addition of diluent to the lyophilized powder, each vial should be repeatedly inverted or rocked, not shaken, for at least 30 seconds for the 2.5g bottles prior to infusion, 60 seconds for the 5g bottles.
    c. Hydroxocobalamin solutions should be visually inspected for particulate matter and color prior to administration.
        i. If the reconstituted solution is not dark red or if particulate matter is seen after the solution has been appropriately mixed, the solution should **not be administered to the patient** and should be discarded.
D. There are a number of drugs and blood products that are incompatible with Cyanokit®, thus Cyanokit® requires a separate intravenous line for administration.
E. Depending upon the severity of the poisoning and the clinical response, a second dose of 5g may be administered by IV infusion for a total dose of 10g in adults. The rate of infusion for the second dose may range from 15 minutes (for patients in extremis) to two hours, as clinically indicated. Contact medical control for second dose instructions for pediatric patients.
F. Contraindications: None

SPECIAL CONSIDERATION FOR SMOKE INHALATION:

Many, but not all, smoke inhalation victims will have cyanide poisoning and may present with burns, trauma, and exposure to other toxic substances making a diagnosis of cyanide poisoning particularly difficult. Prior to administration of Cyanokit®, smoke inhalation victims should be assessed for the following:

- Exposure to fire or smoke in an enclosed area
- Presence of soot around the mouth, nose or oropharynx
- Altered mental status

The Cyanokit® should be considered for all serious smoke inhalation victims (including cardiac arrest).

*NOTE: A single medical control order in a mass casualty incident may be applied to all symptomatic patients.

This medication is not required to be carried on EMS vehicles and may be available through special response units.