



VITALS

Mike Szczygiel (Segal)
888-969-8033
meszczygiel@thomcoins.com

A Weekly Safety Newsletter For Medical Transport Professionals

Know What You're Getting Into! Part 3

Remember we have two cases for discussion. Do you think the MSDS for nitroaniline gave you enough information? Do you think smelling a patient to determine the need for decontamination constitutes a best practice?

Inhalation or ingestion of nitroaniline causes headaches, shortness of breath, nausea and unconsciousness (seizures, brady or ventricular dysrhythmia). Chronic exposure is associated with liver damage. Eye contact causes irritation and possible corneal damage. Skin contact initially causes irritation, but continued exposure may cause the same symptoms as inhalation or ingestion. Fingernails, lips and ears become bluish. This cyanosis is the result of methemoglobinemia not hypoxia.



The heme groups contained in hemoglobin molecules contain an iron molecule with a 2+ charge that allows it to share an electron with oxygen and form oxyhemoglobin. When the iron releases the oxygen it goes back to its 2+ charge. If the iron molecule has a 3+ charge it can't bind with oxygen. When the iron in hemoglobin has a 3+ charge, the hemoglobin is called methemoglobin. Oxygenated blood is red; deoxygenated blood is blue, and blood that has methemoglobin is dark, reddish, brown. Consequently, clinical cyanosis occurs at methemoglobin levels of 1.5g/dl, but it takes 5g/dl of deoxygenated blood for cyanosis to happen. Why is this a consideration?

Normal methemoglobin is around 1% (range 1%-3%). With concentrations of 3-15% slight skin discoloration occurs. At 15-20%, the patient will be blue but relatively asymptomatic. With methemoglobin levels of 25% - 50%, headache, dyspnea, light headedness, weakness, confusion, palpitations and chest pain occur over 50%, altered mental status and delirium.

Prehospital care is focused on removing the offending agent (in this case nitroaniline), providing supplemental oxygen and supportive care. However, clinical recognition is really important, because patients may initially have only vague complaints. Note that pulse oximetry is inaccurate and unreliable in patients with abnormal amounts of methemoglobin. Methemoglobin absorbs light at wavelengths that absorb deoxyhemoglobin and oxyhemoglobin. So, in a patient with this type of exposure, an abnormal pulse oximetry value in an asymptomatic patient might suggest the presence of methemoglobin. There was conflicting treatment information in some of the sources, which strengthens the need for strong medical oversight.



Both of these cases stress the need for vigilance, planning and a clear designation of the roles of all responders to hazardous materials incidents, which of course must be *recognized* as HazMat events. A nurse almost died. Emergency Responders required ambulance transport. Two EDS were closed. Did they know what they were getting into?

Sponsored By: THOMCO

This publication is provided for information purposes only and is not intended as a complete or exhaustive source of compliance or safety information. This "Safety Brief" is advisory in nature and does not warrant, guarantee, or otherwise certify compliance with laws, regulations, requirements, or guidelines of any local, state, or Federal agency.