Urgent Memorandum

From: Dr Zac Fitzgerald (Lead Consultant for Inpatients)
To: All Inpatient Consultants and trainees,
On Call Doctors
Matrons and Ward Managers
Medical Director
Chief Executive Officer

Date: 29 August 2013

URGENT NOTIFICATION REGARDING NEAR FATAL USE OF “RED BUZZ” also known as “POPPERS/ LIQUID GOLD” (AMYL NITRITE/ AMYL NITRATE/ ISO-BUTYL NITRITE/ ISO-PROPYL NITRITE)

In the last 2 days there have been 2 instances of inpatients at a Manchester Hospital suspected of ingesting substances analogous to Amyl Nitrate (also known as “Red Buzz”, “Poppers” or “Liquid Gold”). On the first occasion the usage appeared to be near fatal. On the second occasion which occurred this afternoon the usage caused medical complications are presently being investigated.

Amyl Nitrate/ Amyl Nitrite/ Iso-Butyl Nitrite and Iso-Propyl Nitrite are powerful veno-dilators which are marketed as “room odourizers” but are usually inhaled nasally by users.

On both occasions the patients swallowed rather inhaled the substance. Both patients appeared to be unaware that these drugs are not meant to be consumed.

These substances can cause immediate death when inhaled. When swallowed the likelihood of fatality is markedly increased.

I have attached a detailed toxicity report provided by the National Poisons Centre which lists all of the effects of Amyl Nitrite. The effect of Amyl Nitrite is analogous to Amyl Nitrate, Iso-Butyl Nitrite and Iso-Propyl Nitrite.

Please can you ensure that in any cases where consumption of these substances is suspected that the following actions are undertaken;

1. Immediate transfer to the Accident and Emergency Department for Medical Review including 12 lead ECG and arterial blood gases to detect for methaemoglobinaemia. Please bear in mind that
methaemoglobinaemia leads to inaccurate pulse oximeter readings.

2. Psychotropic medication is suspended until Consultant review. The risk of a fatal cardiac event is likely to be increased manifold in patient’s prescribed psychotropic medication. There is no pharmacokinetic data available on the elimination time for these drugs when they are ingested.

If you suspect patients of supplying these substances to patients on the wards please consider safe discharge or suspend leave and liaise with the Matrons to determine whether police involvement is required.

If you suspect a patient of using these drugs currently or in the future please take preventative measures such as stopping leave, observation etc.

In patients were there is a risk of usage of these substances please advise of the particular dangers of ingestion in accordance with the harm reduction Public Health Policy. Patients should also be advised of the risk of immediate death when these drugs are inhaled or ingested.

It appears these substances are very easily obtained within a short distance from the Hospital. At this stage it is unclear whether the drug was procured by the patients themselves or whether this was supplied by other patients/visitors. Greater Manchester Police are investigating the availability of these substances.

Information for Doctors and Nurses provided by the National Poisons Centre (information also applies to Amyl Nitrate/ Iso-Butyl Nitrite and Iso-Propyl Nitrite)

Amyl nitrite

The information on TOXBASE® requires expert clinical interpretation (ideally users should complete the TOXBASE® E-Learning modules; click here) and, therefore, should only be used by clinically trained medical/nursing professionals, who are responsible for the correct interpretation of the relevant clinical case history. In severe or complex cases, including multiple ingestions, you should always discuss your case with your poisons service: in the UK NPIS 0844 892 0111, in Ireland NPIC (01) 809 2566.

TOXBASE® entries should not be used as patient information sheets.

Type of Product
Yellow volatile liquid with fruity smell. Formerly used for the treatment of angina. Used in some countries in treatment of cyanide poisoning. Used recreationally for alleged aphrodisiac properties.

Amyl nitrite was reclassified from pharmacy only sale to a prescription only medicine in January 1997.

Synonyms
Specifically for amyl nitrite:
Ames, Aimies (this is also a slang term for amphetamine), Amyl, Amys, Bananas, Boppers, Hardcore, Pearl, Red rush, Zap.
For alkyl nitrites (amyl nitrite, butyl nitrite or isobutyl nitrite):
Most commonly Poppers. Also Angels (also slang term for amytal), Blue heavens, Buds, Heart-on, Kix, Liquid incense, Liquid gold (LG), Locker popper, Locker room, Nitro, Ram, Snappers, Sweat, Thrust and TNT (also slang term for heroin).

Ingredients
Amyl nitrite
Clear glass vitrellae 0.2 mL

Toxicity
Alkyl nitrites are vasodilators which also oxidise ferrous iron (Fe$^{2+}$) to ferric iron (Fe$^{3+}$) in haemoglobin to produce methaemoglobin which will reduce oxygen carrying capacity. Patients with methaemoglobinaemia > 7-10% appear to have central and peripheral cyanosis. Blood drawn by venepuncture may appear dark brown in colour.

Toxicity occurs by inhalation, ingestion and dermal absorption. Death is very rare.

Rapid absorption occurs through the lungs, GI tract, skin and mucosae. Toxic features appear within seconds of inhalation and are usually moderate and short-lived but may last up to 12 hours if exposure is prolonged. Features occur within 1-2 hours of ingestion.

**ALERT BOX**
All patients who have been exposed to any amount should be referred to hospital.

Organic nitrites - features and management
Revised 6/2007 Updated 10/2010

Features
Mild: nausea, vomiting, blurred vision, xanthopsia (objects appear yellow), flushing, sweating, chills, throat irritation, coughing, dyspnoea and/or tachypnoea, haemoptysis, throbbing headache, dizziness, lethargy, incoherent speech, ataxia, vertigo, fainting, euphoria, altered perception of time and aggressiveness. Allergic reactions are possible with wheezing and itching.

Moderate: tachycardia or, less commonly bradycardia, hypotension or, occasionally hypertension. Haemolysis can occur, which may be more likely in patients with G6PD deficiency (Stalnikowicz et al 2004, Graves and Mitchell 2003, Costelo et al, 2000).

Severe: methaemoglobinaemia, hypoxia, metabolic acidosis, respiratory depression, coma, convulsions, cardiovascular collapse and death.

Eyes: vapours may produce transient lacrimation and stinging. Splashes in the eye usually cause only mild irritation but corneal damage has been reported. Visual loss associated with retinal toxicity has been reported, but appears rare. This may resolve over several weeks.

Recreational use: abuse of alkyl nitrites causes contact and allergic dermatitis particularly around the nose and lips. Prolonged contact with the skin can cause systemic features. As these chemicals are flammable, thermal burns have occurred.

Management
Inhalation
1. Remove from exposure.
2. Maintain a clear airway and adequate ventilation.
3. Give oxygen.
4. The management of systemic features is described below.

**Ingestion**

1. The benefit of gastric decontamination is uncertain. Consider activated charcoal (charcoal dose: 50 g for adults; 1 g/kg for children) if within 1 hour of ingestion.
2. Systemic features are highly likely after ingestion of even small amounts. Management is described below.

**Skin contact**

1. Remove all soiled clothing.
2. Wash contaminated areas thoroughly with soap and water.
3. Systemic features are only likely with prolonged exposure.

**Management of systemic features**

1. Monitor pulse, blood pressure, cardiac rhythm and perform 12 lead ECG. In the presence of methaemoglobinemia pulse oximetry is unreliable.
2. Measure arterial blood gases and methaemoglobin concentration (from an arterial sample). Give high concentrations of oxygen if the patient is symptomatic from methaemoglobinemia.
3. In cases of methaemoglobinemia consider the need for treatment with methylthioninium chloride (methylene blue). Usual indications are a methaemoglobin concentration \( \geq 30\% \). Antidotal therapy is occasionally indicated at methaemoglobin concentrations below 30% if there are symptoms or signs suggestive of tissue hypoxia (e.g. fits, coma, chest pain, ischaemic ECG). Concentrations less than 20% are not usually associated with symptoms and do not require treatment.

If in doubt:

Discuss with your local poisons information service: in the UK NPIS 0844 892 0111, in Ireland NPIC (01) 809 2566.

Click [here](#) for details you may be required to give when telephoning NPIS.

4. **Hypotension**

Correct hypotension by raising the foot of the bed and by adequate fluid resuscitation with a crystalloid. Treat brady and tachyarrhythmias appropriately.

Poisoned patients with fluid-resistant hypotension can deteriorate extremely rapidly and should be managed by experienced physicians. Patients should be referred as appropriate to the local critical care team (ICU) for adults, or paediatric intensive care unit (PICU) for children.

Reduced cardiac output is a common toxic effect of poisons that cause fluid-resistant hypotension (even for some drugs that are vasodilators in therapeutic use [e.g.
Therefore inotropes may be used initially for further management of poisoned patients with severe hypotension, unless the predominant toxic mechanism is vasodilation. The toxicity section of this entry will state the expected mechanism, if known.

However both mechanisms (reduced cardiac output and vasodilation) frequently co-exist in severe or mixed poisoned, and both vasopressors and inotropes may be needed. Invasive vascular monitoring and echocardiography may help identify the specific mechanisms operating in a particular patient.

Inotropes and vasopressors can be initiated in an emergency. THIS SHOULD ONLY BE DONE UNDER THE DIRECTION OF AN EXPERIENCED PHYSICIAN (SpR AND ABOVE). Click here for further advice on doses.

If severe hypotension further persists discuss with your local poisons information service: in the UK NPIS 0844 892 0111, in Ireland NPIC (01) 809 2566.

Click here for details you may be required to give when telephoning NPIS.

5. Convulsions
   Give oxygen, check blood glucose, U&Es and ABG. Correct acid base and metabolic disturbances as required.
   Single brief convulsions do not require treatment.
   Control convulsions that are frequent or prolonged with intravenous diazepam (10-20 mg in adults; 0.1-0.3 mg/kg body weight in children) or lorazepam (4 mg in adults and 0.1 mg/kg in children).
   If unresponsive to the above measures, click here for further management.

6. Metabolic acidosis
   If metabolic acidosis persists despite correction of hypoxia and adequate fluid resuscitation consider correction with intravenous sodium bicarbonate.
   **Adults:** an initial dose of 50 mmol sodium bicarbonate may be given and repeated as necessary, guided by arterial blood gas monitoring (aim for a pH of 7.44 [Hydrogen ion concentration 36]). The volumes for different concentrations of sodium bicarbonate to achieve a dose of 50 mmol in adults are shown here.
   **Children:** Use 8.4% sodium bicarbonate diluted in an equal volume of 5% glucose and give a “calculated” dose: dose (in mmol) = desired change in base deficit (current-target) x 0.3 x weight of child up to a maximum of 50 mmol. Administer at a rate of 1 mmol/minute.
   Since bicarbonate is irritant to veins and can cause local necrosis in cases of extravasation, administration by a central venous line is recommended where possible.
   **Adults and children:** Recheck acid base status after administration of sodium bicarbonate. Large amounts of bicarbonate (several hundred mL) with repeated pH checking, may ultimately be required to correct the metabolic acidosis. Monitor electrolytes since there is a risk of hypokalaemia and possibly hypernatraemia if substantial amounts of bicarbonate have been administered.
7. Other measures as indicated by the patient's clinical condition.

Patients should be advised on discharge to seek medical attention if symptoms subsequently develop.