1. Introduction and Who Guideline applies to
This guideline describes the safe use of pethrox (methoxyflurane) – a potent analgesic delivered by a patient-administered inhaler device. Pethrox is NOT a controlled drug. Particular benefits include rapid onset and recovery, and a reduced need to use strong opiates or procedural sedation. [1,2] There is also some evidence of reduced length of stay (LOS) in certain patient groups managed with Pethrox. [3] The potential for abuse has been found to be low. [4] The guideline applies to clinicians (doctors and nurse practitioners) and qualified nursing staff working in the Adult Emergency Department, Professor Harper Trauma Clinic and Fracture Clinic.

2. Guideline Standards and Procedures
2.1 The guideline is presented in the format of a proforma, shown in Appendix A and Appendix B.
2.2 Patients may continue to use pethrox during imaging and transfers within the ED but must remain on a trolley as they may become unsteady

3. Education and Training
• Sufficient numbers of ED and Fracture Clinic staff have been trained in the safe use of the pethrox inhaler by the pharmaceutical company representative prior to the implementation of this guideline, and further ad hoc training sessions will be arranged as necessary
• Staff already familiar with the device should cascade training to other staff on an opportunistic basis
• Radiographers and porters working with the ED have been informed that patients will be using pethrox during imaging / transfers within the ED

4. Monitoring Compliance

<table>
<thead>
<tr>
<th>What will be measured to monitor compliance</th>
<th>How will compliance be monitored</th>
<th>Monitoring Lead</th>
<th>Frequency</th>
<th>Reporting arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Appropriate proforma completion</td>
<td>Audit of first 50 cases managed in Professor Harper Trauma Clinic and Fracture Clinic after guideline launch</td>
<td>Alwyn Abraham</td>
<td>Within 3 /12 of commencement</td>
<td>TAS (Therapeutic Advisory Service)</td>
</tr>
<tr>
<td>• Adverse reactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>• Failure rate / need for alternative technique</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

5. Supporting References
6. Key Words
Analgesia, pain, procedure, procedural, trauma, injury, fracture, inhaled, inhaler, burn, dislocation, amputation, chemical, penthrox, methoxyflurane, emergency, ED, A&E, sedation, Fracture Clinic.

<table>
<thead>
<tr>
<th>CONTACT AND REVIEW DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guideline Lead (Name and Title)</td>
</tr>
<tr>
<td>Martin Wiese – Emergency Physician</td>
</tr>
</tbody>
</table>

Details of changes made during review:
- Scope expanded to include Fracture Clinic, changing it from a Cat C to a Cat B guideline
- Algorithm and user instructions combined into a proforma to improve documentation
- Obstructive sleep apnoea added as specific contraindication
- Requirement for prescriber to be present during procedural analgesia changed to trained staff
- Requirement to collect a patient sticker for every administration in ED removed
Penthrox (methoxyflurane) inhaled analgesia

Intended to aid safe prescribing of procedural analgesia and/or immediate bridging analgesia prior to systemic pain relief in patients with traumatic injuries and a pain score of 7-10 or obvious severe pain.

Do not use penthrox in non-traumatic conditions.

Indication (tick as applicable)
- Bridging analgesia for
  - Fracture
  - Dislocation
  - Burn
  - Chemical injury
  - Amputation
  - Soft tissue injury
- Procedural analgesia

Record specific indication

Contraindications include
- C Cardiovascular instability (shock)
- H Hypersensitivity to methoxyflurane or any other inhaled anaesthetic
- E Elevated temperature from an anaesthetic (i.e. personal or family history of malignant hyperthermia)
- C Consciousness reduced e.g. from head injury, illness, drugs causing drowsiness such as opiates, or alcohol
- K Kidney impairment (i.e. regular renal OPD patient, very dehydrated, or taking nephrotoxic antibiotics such as tetracycline, amphotericin B, gentamicin, colistin, or polymyxin B)
- A Age below 18 years
- L Lung or respiratory impairment, including obstructive sleep apnoea and current respiratory depression
- L Liver impairment due to jaundice or chronic liver disease, or at risk from alcohol misuse or from taking enzyme inducers such as isoniazid, rifampicin or phenobarbital, or history of liver damage after use of methoxyflurane or other inhaled anaesthetic
- L Last penthrox administration ≥ 6ml already used today, used yesterday or 15ml total used within last 7 days

Any unwanted effects observed?
- None

Patient details
- Full name
- Date of birth
- Unit number

Are there any contraindications?
- Yes
- No

Inform patient of potential
TEMPORARY unwanted effects:
- Dizziness,
- Headache
- Tiredness
- Nausea (and, rarely, vomiting)
- Taste disturbance
- Dry mouth
- Coughing
- Restlessness or agitation
- Altered state of consciousness
- Blurred vision

Does patient consent to use penthrox?
- Yes
- No

Clinic to prescribe Penthrox as shown below

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Dose</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methoxyflurane</td>
<td>3mL</td>
<td>inhaled</td>
</tr>
</tbody>
</table>

(Rarely, a second dose might be needed later)

Take a penthrox pack and a Patient Alert Card
Hand the completed alert card to the patient
Deliver penthrox analgesia, following the administration instructions on the next page
For procedural analgesia, staff trained in penthrox administration must remain present
Record any unwanted side effects in box
Institute follow-on analgesic strategies, e.g. nerve blocks, splinting, PO and IV analgesics
File this proforma in patient’s record when done

Penthrox NOT appropriate

Assessment was carried out by

Print name: Martin Wiese
Signature: Part of penthrox (methoxyflurane) inhaled analgesia guideline for adults
Approved by: PGC on 16Nov20
Review due: Dec23
Trust Ref: B44/2020

Page 3 of 4
Next Review: Dec 2023

NB: Paper copies of this document may not be most recent version. The definitive version is held in the trust’s Policies and Guidelines Library
Penthrox (methoxyflurane) inhaled analgesia
Emergency Department, Professor Harper Trauma Clinic and Fracture Clinic Guideline for Adults

Page 4 of 4

Approved by Policy and Guideline Committee on 16 Nov 2020
Trust Ref: B44/2020
Next Review: Dec 2023

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Appendix B. User proforma – back page.

Administration instructions Registered, trained staff only

1. Insert the activated carbon chamber into the dilutor hole on the top of the inhaler

2. Use the base of the inhaler to loosen the vapour bottle cap with a ½ turn, then separate the bottle from the inhaler and remove the cap by hand

3. Tilt the inhaler to a 45° angle and pour the total contents of the bottle into the base of the inhaler whilst rotating it

4. Replace bottle cap bottle and place it in plastic bag from pack. Place bag on patient’s trolley so it can later be used to safely dispose of inhaler.

5. Place loop over patient’s wrist

6. After use, place inhaler in the plastic bag already containing the vapour bottle, seal and dispose of it in sharps bin

For spontaneous pain

Instruct patient as follows:

- Breathe in and out through the inhaler so the exhaled vapour is captured in chamber

- Breathe gently for the first few breaths and then breathe normally through inhaler (i.e. big breaths are NOT required)

- You will feel pain relief after 6-10 breaths

- Continuous inhalation provides pain relief for up to 25-30 minutes, but it is usually NOT necessary to inhale constantly and this might also cause unwanted drowsiness

- Inhale intermittently, at the lowest possible dose to achieve pain relief – you will soon get the hang of it!

For procedural analgesia

Instruct patient as follows:

- Breathe in and out through the inhaler so the exhaled vapour is captured in chamber

- Breathe gently for the first few breaths and then breathe normally through the inhaler (i.e. big breaths are NOT required)

- Keep going like this for a few minutes to ensure the vapour reaches its maximum effect; we will then start the procedure

If patient becomes uncomfortable, stop procedure, deepen analgesia then restart; instruct them to do the following:

- Take deeper breaths now while covering the dilutor hole of the chamber with one finger

- Hold each breath in your lungs for a few seconds before breathing out

- You might become drowsy and loose awareness, but this will make you stop inhaling the vapour and you will then become fully conscious again very rapidly

NB: Patient must remain on trolley including during imaging or transfer as they might become unsteady

NB: Trained staff to remain with patient throughout Penthrox use

Remove inhaler from their mouth if they are getting too sedated (recovery should then be rapid)