

Position Responsible: Medical Director  
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Related Documents	PAM Femoral Nerve Block PAM Wrist Block PAM Ankle Block
Further Information	Fundamental Principles and Practice of Anaesthesia, Hutton

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## **1.0 Background**

1.1 Pain is a common symptom following trauma and in medical conditions, and there are important reasons for wanting to relieve pain:

- Humanitarian
- Facilitate extrication – Fire & Rescue units describe that a common reason for delay in extrication is the perception that the process is causing the trapped patient pain
- Reduces metabolic demand (reduces brain and coronary oxygen requirements, thus reducing secondary injuries)
- Permits medical interventions

1.2 Pain is often poorly treated. There is good evidence that children especially, receive insufficient pre-hospital and emergency department analgesia.

1.3 Whilst pain relief is important, it should not come before looking for and treating life-threatening injuries. However, analgesia can usefully bring control to a situation that will allow proper examination.

1.4 The aims of this SOP are:

- To outline the importance of pain relief
- To describe the methods of pain relief available to the team
- To describe the advantages and disadvantages of different forms of pain relief

## **2.0 Pain assessment**

2.1 The assessment of pain allows the clinician to choose an appropriate intervention to relieve the pain, and can also be used to monitor the effectiveness of the analgesic.

2.2 Adults should be asked, where possible, to rate their perception of pain on a scale of 0 to 10, where 0 is 'no pain' and 10 is 'the worst possible pain they can imagine'. Children may be asked the same question although their understanding is often limited. In these cases, assessment can be based upon a visual scale (the Alder Hey Pain Scale) or using a combination of clinical judgement and information from others present eg parents.

2.3 Severity of pain should be assessed and analgesia titrated against severity in a stepwise manner. Drug and non-drug interventions should be used synergistically, and pain should be regularly reassessed.

### **3.0 Methods of Pain Relief**

3.1 It is important that all patients are reassured and anxiety is reduced as much as possible. Reassurance and distraction techniques are particularly important for children.

3.2 Immobilisation; most fractures can be made less painful by splinting.

3.2.1 **Box splints** - These consist of three long padded boards and a foot piece that can be placed around a limb to provide support. They are suitable for immobilising ankle and lower leg fractures, injuries around the knee, and forearm fractures. Box splints are carried on every ambulance vehicle.

3.2.2 **Traction splint** – a traction splint can be used for closed and open fractures of one or more limbs. It reduces pain by distracting the two broken ends of the bone, and also decreases the potential bleeding space in the thigh created by a fractured femur.

3.2.3 Before and after application the rescuer should check the distal neurovascular status of the limb.

### **4.0 Inhalational Analgesia**

4.1 Nitrous Oxide – Entonox

Although entonox is not carried by the team it is commonly available within the ambulance Services. It must be inhaled steadily for several minutes in order to achieve a peak effect.

- Uses - Nitrous oxide has analgesic and anaesthetic properties.
- Side effects - Nausea
- Cautions- should not be used in those with actual or suspected pneumothorax, basal skull fracture or facial injuries. It is important to be aware that when giving entonox, only 50% oxygen is delivered to the patient compared to 80% with a non-rebreathing mask.

4.2 Methoxyflurane – Pentrox

The Pentrox inhaler is a portable, handheld device used for self-administration of the analgesic methoxyflurane. The Pentrox inhaler is licensed for the emergency relief of moderate to severe pain in conscious adult patients with trauma and associated pain. Although not licensed for children, it can be used if clinically indicated.

- A bridging analgesic whilst trying to obtain IV access or set up for formal ketamine sedation
- Additional analgesia for patients with trauma along with IV analgesics in a multimodal approach
- Patient controlled procedural analgesic for moderately painful procedures e.g. moving patients with fractures, simple splinting.

### **5.0 Oral analgesia**

5.1 The team does not carry any oral analgesia. The ambulance service carry paracetamol and ibuprofen tablets and suspension. Many simple over-the-counter medications are available and can be advised for those who are discharged from the scene.

## 6.0 Intravenous analgesia

6.1 Opioids - The team carries morphine and fentanyl. These both give good pain relief and a sense of euphoria when titrated in small boluses. They have the following properties:

- Dose – see table below. Dose may need to be adjusted based upon patient characteristics (age, weight, physiology) or prior use of an analgesic (same analgesic or different)
- Uses - Analgesia, anxiolysis
- Side Effects - Hypotension, respiratory depression, nausea. Incidence of nausea is low and prophylactic anti-emetics are not recommended routinely
- Cautions - Known allergy, anticipated nerve block. Hypovolaemia; increases the side-effects of opioids. Elderly; lower doses are usually needed

	Dose	Peak Action	Notes
Morphine	0.1mg/kg	15 minutes	
Fentanyl	Analgesia – 1mcg/kg	5 minutes	Fentanyl is useful for rapid pain relief. Its clinical effects will last approximately 45 minutes so repeated doses may be necessary. Morphine can be used after gaining analgesic control to give longer-lasting relief once the fentanyl is metabolised.

6.2 Ketamine - ketamine has analgesic, sedative and anaesthetic properties. Analgesic doses of ketamine are less effective than opioids at relieving pain associated with visceral injuries.

- Dose – Analgesia = 0.1mg/kg (typically 5-10mg), repeated as required, allowing time for action.
- Beware giving analgesic doses too quickly as this may result in an unanticipated sedation.
- Side effects - Nausea, respiratory depression, hypersalivation.
- Cautions - Heart disease.
- Other - Some patients will experience hallucinations following use of ketamine, some of which can be quite unpleasant. These are less common in the very young and elderly. Midazolam, together with a calm atmosphere, can be used to minimise the distress of hallucinations – doses of Midazolam 1-2mg should be titrated to effect.

6.3 Paracetamol – The East of England Ambulance Service carry intravenous paracetamol and this may be considered as part of the analgesic strategy. The dose is 15mg/kg (or 1 gram for an adult >50kg)

## 7.0 Intranasal Analgesia

7.1 Intranasal fentanyl is an effective, safe, and acceptable method of providing analgesia in children.

- Dose – 1.5mcg/kg
- Side effects – those of opiates
- Cautions – base of skull fracture, nasal injury
- Other - A dosing *aide memoire* is carried in the drug pouch.

## **8.0 Regional anaesthesia / nerve blocks**

- 8.1 Nerve blocks are an effective way of providing good analgesia without using large doses of opiate medication. They can be performed easily and safely in the pre-hospital environment, and are ideal for partial or complete amputation of limbs or digits, and to relieve pain in those with fractures of the femur.
- 8.2 Consider the use of wrist, ankle, femoral or facia iliaca nerve blocks. The techniques are described in SOPs Regional Nerve Blockade and within Procedural Aide Memoirs (PAMs).
- 8.3 The team is able to use lidocaine 1% (=10mg/ml, max dose 3mg/kg) *and levobupivacaine (chirocaine) 0.5% (max dose 2mg/kg)* either as stand-alone agents or in combination with each other. For ease of calculation and to maintain safety if used combined the cumulative maximum dose is 2mg/kg.
- 8.4 Prior to undertaking regional anaesthesia all patients must have the minimum monitoring applied: ECG, SpO2 and NIBP. Team members must maintain an awareness for the signs of toxicity.
- 8.2 Be cautious using nerve blocks **after** systemic analgesia has been given, as respiratory depression may occur.

## **9.0 Burns**

- 9.1 Analgesia is best accomplished by cooling and covering the burned area. All ambulances carry special burns dressings. Intravenous opioids or ketamine can be titrated to effect to help also. In children intranasal fentanyl is an option that may be considered. Entonox or Pentrox can be used but it may be difficult to administer and decreases the oxygen delivery.

## **10.0 Babies**

- 10.1 Evidence suggests sucking on a dummy and sugary drinks have analgesic properties among babies, and should be considered as part of the pre-hospital treatment. Intranasal, intravenous and intraosseous routes of opioid analgesia may all be employed.

## **11.0 Anaesthesia**

- 11.1 Sedation is typically maintained with ketamine, in which case additional opioid analgesia is not usually necessary. Midazolam and propofol do not provide analgesia, it is important that a balanced anaesthetic consists of adequate analgesia.

## **12.0 Unconscious patients**

- 12.1 Unconscious patients, like anaesthetised patients, will require analgesia in order to reduce the metabolic demand and oxygen requirements of the brain and other organs.

## **13.0 Transport and Handover**

- Under circumstances when atypical analgesics (eg ketamine) have been used the team would be expected to accompany the patient to hospital.
- Air-transfers should be used with extreme caution in those patients that have received analgesics that may reduce their level of consciousness or induce vomiting (eg ketamine, opioids)
- Clearly communicate exactly what analgesia has been given to the receiving team (including timing of last dose)

- It is especially important that the use of nerve blocks is handed over. A sticky patch has been developed to attach to the patient indicating the area of the block, drugs used, and the time of completion (see appendix 1).
- If emergence phenomena occur following ketamine use, the team may be required to manage these within the Emergency Department (as some will be unfamiliar with its use). If midazolam has been given, this too must be communicated to the receiving team.

Nerve block				
For more information refer to the Magpas Patient Report Form and hospital notes				
<b>Anaesthetic</b>				
Lidocaine	%	ml	a t	:
Levobupivacaine	%	ml	a t	:
<b>Nerve block</b>				
<div style="border: 1px solid black; padding: 10px; display: inline-block;">Nerve blocked</div>				
				