



LONDON'S
AIR AMBULANCE
roadside intensive care



Pre-hospital Care Standard Operating Procedure

Analgesia and Sedation

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APPROVAL/ ADOPTED:	PHC Policy Board	
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Aims:

- Describe the pre-hospital care analgesic and sedative drugs.
- Describe specific indications and proper use of each drug.

Background:

Analgesia is important on humanitarian grounds and also to meet clinical endpoints that are vital to the resuscitation philosophy of the service. The use of analgesia will facilitate fracture manipulation and splintage, and therefore help to reduce blood loss. In some circumstances, such as entrapment, judicious use of an analgesic will facilitate extrication and reduce time to critical interventions and definitive care.

Principles:

All patients are to have their analgesic needs assessed and addressed.

All drugs drawn up into syringes are labelled in a standardised way with name, concentration, date and time.

All sedative and analgesic drugs should always be administered with a small test dose and flush for patient sensitivity and then titrated to effect, flushing with normal saline between aliquots.

Policy:

All patients are to have their analgesic needs assessed and addressed. Masking of clinical signs is not a reason to withhold pain relief. Where possible, analgesia is to be diluted, delivered intravenously and titrated to effect. In circumstances where intravenous access is difficult, intramuscular injections can be considered, e.g. severe burns. This route is only applicable to ketamine and morphine. The muscle should be rubbed post IM injection to facilitate absorption. Despite appearances some injuries are not particularly painful. Treat the patient's pain and not your perception of their pain. If the patient does not complain of pain or has a low pain score, analgesia is not required.

1. The Drugs

NB. These are **adult doses**- for paediatric doses consult the Pre-hospital Care paediatric aide memoire.

KETAMINE

Uses: **Analgesia 0.1mg/ kg [1.0mg/kg IM]** then 5- 10mg bolus to effect
Patients who are normo / hypertensive and GCS 15 with severe pain may require a starting bolus up to 0.5mg/ kg IV [5mg/kg IM] followed by 10mg boluses titrated to effect.

Procedural sedation/ analgesia 0.5mg/kg [5mg/kg IM] followed by 10- 20 mg boluses titrated to effect.

Induction agent 2mg/kg IV [10mg/kg IM]

Ketamine must be given for a specific indication, which must be recorded on the run sheet. An estimated weight must be used to calculate drug does. The estimated weight must be recorded. The appropriate dose must be calculated according to indication.

Ketamine is not routinely indicated to control agitation in head injuries. Administration for this purpose is rare and would usually mandate IM administration under these circumstances.

Presentation: **Caution** different concentrations - 20ml vial [10mg/ml] and 10ml vial [100mg/ml]

Preparation: At the beginning of any shift a 10ml syringe containing 100mg of ketamine is to be available in each drug roll in the monitor pack. This is made up using the 20ml vial. The stronger ketamine solution is kept sealed in the Thomas pack. Any used or wasted ketamine must be signed for in the Controlled Drug Register. This syringe is replaced every 48 hours.

Routes: Suitable for IV (10mg / ml) and IM (100mg / ml) use.

MORPHINE

Uses: **Analgesia. Start dose 2mg** for adults then flush, wait for effect and titrate as required in 2mg aliquots.

Presentation: Two presentations
-10 ml pre-filled syringes [1mg / ml]
-1ml vial [10mg/ml].

Preparation: At the beginning of any shift a 10ml syringe containing 10mg of morphine is to be available in each drug roll in the monitor pack. In the absence of a pre-filled syringe, the 1ml morphine vial should be diluted in 9ml of saline to give 10mls of a 1mg per ml solution.

The expiry date for the pre-filled syringes is recorded on the syringe.
Non pre-filled syringes must be replaced every 24 hours.

Any used or wasted morphine must be signed for in the Controlled Drug Register.

Routes: Suitable for IV [1mg/ml] and IM [10 mg/ml] use

MIDAZOLAM

Uses: Sedation. Start dose 2mg for adults [consider 0.5- 1.0 mg in the elderly and haemodynamically unstable patient]. Flush, wait for effect and titrate as required in 1-2mg aliquots.

Adjunct in ketamine administration to reduce dysphoric reactions. Give 1mg (small adult) or 2mg (large adult) prior to ketamine administration.

Presentation: Two presentations
-10ml pre-filled syringes [1mg/ml]
-2ml vial [5mg/ml].

Preparation: At the beginning of any shift a 10ml syringe containing 10mg of midazolam is to be available in each drug roll in the paramedic pack. In absence of pre-filled syringes, the 2ml midazolam vial should be diluted in 8ml of saline to give 10mls of a 1mg per ml solution.

The expiry date for the pre-filled syringes is recorded on the syringe.
Non pre-filled syringes must be replaced every 24 hours.

Routes: IV use only

DIAZEPAM

Is used for termination of seizures only and is found in the yellow drugs pouch of the Thomas pack. It comes as a 2ml vial [10mg total].

LIDOCAINE

Is used as a local anaesthetic and comes as 5ml of a 2% solution [100mg]. It can be found in the Thomas pack and medical drugs pack.

2. Scenarios – to illustrate appropriate usage of available drugs

• Fractures / manipulation / extrication

Ketamine is the drug of choice for fractures that require manipulation. Unless the patient is hypovolaemic, all patients receive a dose of midazolam [1-2mg] prior to ketamine [this reduces the dysphoria associated with ketamine]. For undisplaced fractures, morphine together with an anti-emetic should be used.

• Penetrating trauma

Morphine is the drug of choice and should be given with an anti-emetic. An exception is the placement of chest drains which should be facilitated with an IV sedative dose of ketamine.

• Maintenance of anaesthesia

A combination of morphine and midazolam is recommended for this purpose. Propofol can be used for intravenous drug users who may be less responsive to morphine and midazolam.

• Emergency sedation in the aircraft

If there is a possibility that a patient may become agitated / combative during transfer then ensure that there is a good IV line in situ, accessible to Medic 1, ensure ketamine and midazolam syringes are close at hand.

- **Femoral nerve block**

This procedure is rarely performed in our practice. It takes time to take effect and is often ineffective when performed without a nerve stimulator. Ketamine is usually very effective for reduction of femoral shaft fractures.

- **Head injury**

For initial management prior to RSI, and / or for ongoing sedation of intubated head injury patients, morphine and midazolam should be used. The use of ketamine is controversial in head injury. Generous use of opiates helps keep ICP down.

Note -patients should ***not*** be sedated for awake carry backs. If a patient requires significant sedation they should normally be anaesthetised before lifting.

3. Monitoring of sedation

- **Intubated patients**

Should have clinical signs monitored to assess depth of anaesthesia. Signs of inadequate anaesthesia include: tachycardia, hypertension, pupil dilatation, sweating and lacrimation.

- **Self-ventilating patients**

End tidal CO₂ can be monitored using nasal cannula. Patient should ideally be in visual contact with Medic 1. Hand signals can be arranged pre-take off.

4. Third party administration of drugs

In some circumstances it may be necessary for non-BLT pre-hospital personnel to administer drugs on our behalf [e.g. during RSI and intubation or when access to the patient is restricted]. In these circumstances errors are more likely to occur due to the use of unfamiliar drugs, dilutions and equipment. The following is the suggested method to minimise errors:

1. Ensure personnel are confident to administer drugs.
2. If wishing to give 2mg (2mls) of midazolam, for example, state "*I would like you to give 2mls of this. We are at 10mls now, therefore give it until you are at 8mls*".
3. Get personnel to repeat the instructions back to you.
4. Monitor ie watch the amount being given.
5. If possible give instructions for, and pass over, only 1 drug syringe at a time.

If you feel your instructions are not comprehended, an alternative approach is to take a smaller syringe, draw up the exact amount you want given, and only hand that over.