Ashford and St. Peter's Hospitals NHS Foundation Trust

Standard Operating Procedure for:

Intranasal Analgesia (Fentanyl and Diamorphine) for children and young people in the Paediatric Emergency Department

Staff relevant to:	Medical and nursing staff in PED
Ratification committee	Paediatric Clinical Governance Committee Drugs and Therapeutics committee
Ratification Date	30th April 2020
Authors	Jennie Thompson, Matron PED Debbie Hopper, Paediatric Pharmacist lead
Expiry date	2023

Purpose and context

- This SOP replaces the Policy and Procedure for the administration of intranasal diamorphine via syringe or atomizer for paediatric analgesia in Paediatric A&E 2016 in response to the unavailability of diamorphine due to a national supply problem, with no anticipated re-supply date
- To provide a safe and effective method of administering pain relief to children with acute pain in Paediatric ED whilst causing minimal discomfort during the procedure.
- If severe pain is anticipated, early adequate pre-emptive treatment is better than attempting to control pain after it has started.
- A dose of opiates via the nasal route of administration is the preferred treatment for acute severe nociceptive pain in children over 3 years old in the emergency setting.
- Intramuscular administration can distress the child, as can intravenous administration, which is also often restricted by nursing protocols. The rectal route suffers from limited acceptability, problems of slow and variable onset, and consent, particularly in unconscious patients (Wilson et al 1997).
- Administration of drugs through nasal mucosa is well described and is attractive for a number of reasons. The nasal mucosa is richly vascularised and the sub epithelial cells are lined by a fenestrated epithelium. The vascular drainage is through the facial and sphenopalatine veins so drugs avoid first pass metabolism in the gut and the liver.
- Patient acceptability is high when compared to rectal and intramuscular/intravenous administration.
- Diamorphine has a number of properties which render it desirable as an analgesic agent for administration by the trans mucosal nasal route.

Indications:

- The nasal route avoids the delay and pain associated with placing IV access, and can result in faster onset and improved bioavailability compared to the oral route.
- Children between the ages of 3 and 16 years in severe pain as defined by pain algorithm in paediatric ED requiring analgesia, but not immediate intravenous access.
- Children who fall into the moderate/severe categories should also be given basic analgesia.
- Most children can and are able to use entonox, remember this can be a valuable source of analgesia whilst waiting for oral analgesia to work.

Contra-indications:

- Known fentanyl or diamorphine hypersensitivity
- Altered conscious level, GCS <15
- Head, Chest or Abdominal trauma with hypovolaemia
- Epistaxis
- Bilateral occluded nasal passages
- MAOI antidepressant within 14 days

Cautions:

- URTI may cause unreliable delivery of drug
- Prior dosing with other opiates/narcotics may cause accumulation

Adverse effects:

Adverse effects are uncommon, but may include

- Respiratory depression
- Hypotension
- Nausea and vomiting
- Itch
- Chest wall rigidity(only reported in rapid large IV doses)

Observations

- Time of administration
- Baseline pre-narcotic observations: HR, RR, BP, oxygen saturations
- Observe closely for adverse reactions and over sedation

Diamorphine dosage using solution for injection

- Dose is calculated according to weight
- Dose: 100 micrograms/kg (0.1mg/kg) intranasal
- The child must be weighed in kilograms.
- Give 0.2 ml of diamorphine solution after using table below for dilution volume

WEIGHT (KG)	VOLUME (WATER FOR INJECTION) mL to add to diamorphine 10mg ampoule
10	2.0
11	1.8
12	1.7
13	1.5
14	1.4
15	1.3
16-17	1.2
18	1.1
20	1.0
25	0.8
30	0.7
35	0.6
40	0.5
45	0.4
50	0.4
55	0.4
60	0.3

How to administer intranasal diamorphine via syringe/MAD

- Tilt the child's head back slightly and administer 0.2ml of the solution into one nostril using a 1ml syringe.
- This gives a dose of 100 micrograms/kg in 0.2ml

Jennie Thompson, Paediatric ED Matron,
Debbie Hopper, Paediatric Pharmacist Lead
April 2020

Diamorphine dosage using the Ayendi intranasal diamorphine solution

720mcg/spray for children 12kg to <30kg

Weight of child	Approx age	Total No. of sprays	Total dose delivered
12kg to <18kg	2 – 5 years	2	1.44mg
18kg to <24kg	5 – 8 years	3 *	2.16mg
24kg to <30kg	8 – 10 years	4 *	2.88mg (max dose)

1600mcg/spray for children and adolescents 30kg to 50kg

Weight of child	Approx age	Total No. of sprays	Total dose delivered
30kg to <40kg	10 – 14 years	2	3.20mg
40kg to 50kg	14 – 15 years	3 *	4.80mg (max dose)

*must be administered into alternating nostrils

Method of administration

- The spray should be directed at the nasal side wall (lateral nasal wall) rather than straight up the nose. It is recommended that the patient sits in a semi-recumbent position at about 45 degrees when the nasal spray is being administered.
- Ayendi Nasal Spray should be delivered using a total of 2 - 4 actuations of the appropriate product strength directed into alternate nostrils and according to the weight of the child.
- The maximum total dose is 2.88mg diamorphine hydrochloride (four actuations) of the 720microgram/actuation product and 4.8mg diamorphine hydrochloride (three actuations) of the 1600microgram/actuation product.
- The patient should then be monitored for at least 30 minutes following administration.
- Ensure that the dip tube remains in the solution during priming and re-priming to avoid air entering the pump spray and affecting dose uniformity.
- A new tip should be used for any new patient to avoid risk of microbial contamination and soiling of the tip

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Fentanyl Dosage

- Intranasal opiates are not recommended in children under 2
- The recommended dose of Fentanyl is 1.5micrograms/Kg. See table below.
  Repeat after 5-10 minutes, if required
- If further analgesia required after second dose, obtain medical review and consider alternative analgesia. (it is acceptable to prescribe multiple dosages if efficacy is good, however, consider whether IV analgesia is required long term)

Fentanyl Administration

- The required volume of Fentanyl injection should be drawn up according to weight in a 1ml syringe , using 2 syringes for dose volumes over 1ml
- Attach Mucosal Atomising Device to syringe.
- Position patient either sitting up at 45^{o} or with head to one side
- Administer dose by inserting in to nostril loosely and aim for centre of nasal cavity prior to squirting
- If the dose is > 1ml, split between both nostrils to prevent loss of solution by sneezing or swallowing
- Depress the plunger quickly
- Hold atomiser in place for 5 seconds to prevent medication from dribbling out of nostril

Dose

Weight (kg)	Initial dose (1.5micrograms/kg)	Volume (ml)
10	15 micrograms	0.3 ml
11-12	18 micrograms	0.35 ml
13-14	20 micrograms	0.4 ml
15	22.5 micrograms	0.45 ml
16-17	25 micrograms	0.5 ml
18-19	27.5	0.55 ml
20 - 24	30 micrograms	0.6 ml
25 - 29	37.5 micrograms	0.75 ml
30 - 34	45 micrograms	0.9 ml
35 - 39	50 micrograms	1ml
40 - 44	60 micrograms	1.2 ml
45 - 49	67.5 micrograms	1.35 ml
50	75 micrograms	1.5 ml
55	82.5 micrograms	1.65 ml
60	90	1.8 ml

Table 1: Intranasal Fentanyl Dosing Chart – based on 50 mcg/ml ampoules

Jennie Thompson, Paediatric ED Matron,
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Treatment of overdose

- **CALL FOR HELP**
- Support airway
- Oxygen
- Assist ventilation
- Consider Naloxone as reversal agent:
    1. Should be administered for excess sedation or respiratory depression
    2. Dose – 1-5 micrograms/kg IM or IV, maximum dose of 100 micrograms, may be repeated every 2-3 minutes if required
    3. Has short duration of action – approximately 30 minutes, may necessitate repeat doses or infusion

References:

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