Neonatal Medication Guideline

Clinical Guideline

Fentanyl

Policy developed by: SA Maternal, Neonatal & Gynaecology Community of Practice
Approved SA Health Safety & Quality Strategic Governance Committee on: 9 November 2017
Next review due: 9 November 2020

Summary
The purpose of this guideline is to guide nursing, medical and pharmacy staff in the dosing and administration of fentanyl

Keywords
fentanyl, neonatal medication guideline, intubation, analgesia, sedation, ventilation, surfactant, naloxone

Policy history
Is this a new policy? N
Does this policy amend or update an existing policy? Y v3.0
Does this policy replace an existing policy? N
If so, which policies?

Applies to
All SA Health Portfolio
All Department for Health and Ageing Divisions
All Health Networks
CALHN, SALHN, NALHN, CHSALHN, WCHN, SAAS

Staff impact
All Clinical, Medical, Midwifery, Nursing, Students, Allied Health, Emergency, Mental Health, Pathology, Pharmacy

PDS reference CG026

Version control and change history

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<thead>
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<td>Current</td>
<td>Addition of pre-filled syringes</td>
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Note

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient’s medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

This is a High Risk Medication

An overdose can be rapidly fatal.

Dose and Indications

Analgesia in Self-ventilating Patients

Intravenous Bolus

0.5 to 1 microgram/kg, a repeat dose may be given at the discretion of the treating consultant

Analgesia and Sedation in Ventilated Patients

Intravenous Infusion

1 to 5 micrograms/kg/hour (titrate to response)

Intubation for Ongoing Ventilation

Intravenous Bolus

4 micrograms/kg/dose

In-Out Intubation for Surfactant Therapy

Intravenous Bolus

1-2 micrograms/kg/dose
Preparation and Administration

Intravenous

Fentanyl 10microgram/mL pre-filled syringe*

*Dilution instructions to make Fentanyl 10microgram/ml (if pre-filled syringe unavailable)

Dilate 1mL of the 100microgram/2mL fentanyl solution with 4mL of compatible fluid (to a total volume of 5mL). The resulting solution contains 10micrograms/mL fentanyl.

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<th>Dose</th>
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<td>0.9mL</td>
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</table>

Shake well to ensure thorough mixing.

Administered as a push **over at least 3 minutes**

Discard remaining solution.
**Continuous Intravenous Infusion**

Select the strength required based on the weight of the infant in the context of any fluid restrictions. Fentanyl Concentration Selection Tables can be found on the following pages of this guideline to assist prescribers to gauge which strength is best for the patient.

Dilute the appropriate volume of 50microgram/mL fentanyl injection using compatible fluid; and administer by continuous infusion. The dilution solution is stable at room temperature for 24 hours.

The three standard strengths available are:

- Fentanyl 4micrograms/mL
- Fentanyl 8micrograms/mL
- Fentanyl 16micrograms/mL

**Formulae**

**To calculate infusion rate (mL/hr):**

\[
\text{Rate (mL/hr)} = \frac{\text{dose (micrograms/kg/hour) x weight(kg)}}{\text{Strength (microgram/mL)}}
\]

**To calculate the dose (micrograms/kg/hour):**

\[
\text{Dose (micrograms/kg/hr)} = \frac{\text{Rate (mL/hr)} x \text{Strength (microgram/mL)}}{\text{Weight (kg)}}
\]
Fentanyl Concentration Selection Table

Fentanyl 4micrograms/mL

To make a 25mL syringe:
Dilute 2mL fentanyl (100microgram/2mL) with 23mL of compatible fluid (total of 25mL).

To make a 50mL syringe:
Dilute 4mL fentanyl (100microgram/2mL) with 46mL of compatible fluid (total of 50mL).

Recommended for neonates weighing <1kg

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Discard remaining solution

Fentanyl 8micrograms/mL

To make a 25mL syringe:
Dilute 4mL fentanyl (100microgram/2mL) with 21mL of compatible fluid (total of 25mL).

To make a 50mL syringe:
Dilute 8mL fentanyl (100microgram/2mL) with 42mL of compatible fluid (total of 50mL).

Recommended for neonates weighing 1kg to 3kg

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Discard remaining solution
Fentanyl 16micrograms/mL
To make a 25mL syringe:
Dilute 8mL fentanyl (100microgram/2mL) with 17mL of compatible fluid (total of 25mL).

To make a 50mL syringe:
Dilute 16mL fentanyl (100microgram/2mL) with 34mL of compatible fluid (total of 50mL).

Recommended for neonates >3kg

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Discard remaining solution

Compatible Fluids
Glucose 5%, glucose 10% (Y-site only), sodium chloride 0.9%

Adverse Effects

Common
Chest wall rigidity, laryngospasm, respiratory depression, miosis, urinary retention, constipation, rash, erythema and bradycardia.
May have a lower incidence of vomiting and constipation than other opioids

Infrequent
Bronchospasm, tremor, hypothermia, tachycardia, hypertension, ureteric or biliary spasm, urticaria, muscle rigidity and myoclonus

Rare
Syndrome of inappropriate antidiuretic hormone hypersecretion (SIADH) and seizures
Monitoring

> Close observation of the neonate for at least 30 minutes is required to assess for respiratory depression
> Pain is best monitored by using a pain score.

Practice Points

> Physiological dependence and tolerance may occur with prolonged use (ie greater than 5 days of continuous dosing)
> Use with CAUTION in neonates:
  - not receiving assisted ventilation
  - with high intracranial pressure or convulsions
  - with urinary retention
  - with bradyarrhythmias or hypotension
> Rapid administration of fentanyl is associated with hypotension, bradycardia, apnoea, respiratory depression and muscle rigidity
> Fentanyl has a shorter half-life and greater cardiovascular stability than other opiates
> If fentanyl is used in conjunction with other sedative medications (e.g. midazolam) the dose of each must be reduced
> Naloxone should be available for reversal of opioid adverse effects.

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