Drug Therapy Protocols: Fentanyl

Policy code	DTP_FEN_0722
Date	July, 2022
Purpose	To ensure a consistent procedural approach to fentanyl administration.
Scope	Applies to all Queensland Ambulance Service (QAS) clinical staff.
Health care setting	Pre-hospital assessment and treatment.
Population	Applies to all ages unless specifically mentioned.
Source of funding	Internal – 100%
Author	Clinical Quality & Patient Safety Unit, QAS
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Fentanyl

July, 2022

Drug class[1,2]

Narcotic analgesic

Pharmacology

Fentanyl is a synthetic narcotic analgesic that acts on the central nervous system by binding with the opioid receptors.[1–2]

Metabolism

Hepatic metabolism and renal excretion.[1]

Indications

- **Significant pain**
- **Sedation**
- **Autonomic dysreflexia**
  (with a systolic BP > 160 mmHg)
- **Induction for Rapid Sequence Intubation (RSI)**

NOTE: Morphine is the preferred narcotic agent except under the following circumstances:

- allergy AND/OR Adverse Drug Reaction to morphine;
- haemodynamic instability;
- known/suspected kidney disease;
- when NAS narcotic administration is the preferred treatment; AND/OR
- suspected ACS.

Contraindications

- Allergy AND/OR Adverse Drug Reaction

Precautions

- Hypotension
- Respiratory tract burns
- Respiratory depression and/or failure
- Known addiction to narcotics
- Current MAOI therapy

Side effects

- Bradycardia
- Drowsiness
- Hypotension
- Nausea and/or vomiting
- Pin point pupils
- Respiratory depression
- Muscular rigidity (particularly muscles of respiration)

Fentanyl

Presentation

- Ampoule, 100 microg/2 mL *fentanyl*

Onset	Duration	Half-life
< 3 minutes	30–60 minutes	2–3 hours

Schedule

- S8 (Controlled drugs).

Routes of administration	
Intranasal (NAS)	ACP2, CCP
Subcutaneous injection (SUBCUT)	ACP1, ACP2, CCP
Intramuscular injection (IM)	ACP1, ACP2, CCP
Intravenous injection (IV)	ACP2, CCP
Intraosseous injection (IO)	CCP

Special notes [1–5]

- Ambulance officers must only administer medications for the listed indications and dosing range. Any consideration for treatment outside the listed scope of practice requires mandatory approval via the *QAS Clinical Consultation and Advice Line*.
- A Morphine Milligram Equivalent (MME) dose of fentanyl can be calculated using the following formula: 100 microg fentanyl = 10 mg MME.
- In the rare situation when combined narcotic (morphine **AND** fentanyl) therapy is administered, the 'Total maximum dose' must be calculated using a combination of all morphine **AND** Morphine Milligram Equivalent (MME) medication (e.g. fentanyl). For example, 10 mg morphine **AND** 100 microg fentanyl would equal the ACP total maximum dose of 20 mg MME.
- Fentanyl is a rapid onset synthetic narcotic that may potentiate respiratory depression and haemodynamic instability, particularly when administered intravenously in the setting of CNS depression of hypovolaemia.
- When fentanyl is administered to a hypotensive patient, ACPs must call for CCP backup where available.
- In the setting of hypotensive adult patients (SBP 90 mmHg) all incremental fentanyl doses must be no greater than 25 microg for IV and no greater than 50 microg for IM.
- There is no significant difference in the effectiveness of IV morphine to NAS fentanyl. The true benefit of paediatric NAS fentanyl administration is that it avoids painful IM or IV administrataion.

Fentanyl

Adult dosages [1,2,4]

Significant pain

ACP1 ACP2 CCP	SUBCUT	*QAS Clinical Consultation and Advice Line* approval required in all situations.
ACP1	IM	≥ 70 yrs/cachectic or frail – **25–50 microg** Repeated at up to **50 microg** every **10 minutes**. **Total maximum dose 100 microg (or MME).** < 70 yrs – **25–100 microg** Repeated at up to **50 microg** every **10 minutes**. **Total maximum dose 200 microg (or MME).**

• Significant pain
• Autonomic dysreflexia (with systolic BP > 160 mmHg)

ACP2	NAS	≥ 70 yrs/cachectic or frail – **25–50 microg.** Repeated at up to **50 microg** every **10 minutes.** **Total maximum dose 100 microg (or MME).** < 70 yrs – **50–100 microg.** Repeated at up to **100 microg** every **10 minutes.** **Total maximum dose 200 microg (or MME).**
CCP	NAS	**25–100 microg** Repeated every **10 minutes.** **No maximum dose.**
ACP2	IM	≥ 70 yrs/cachectic or frail – **25–50 microg** Repeated at up to **50 microg** every **10 minutes**. **Total maximum dose 100 microg (or MME).** < 70 yrs – **25–100 microg** Repeated at up to **50 microg** every **10 minutes**. **Total maximum dose 200 microg (or MME).**
CCP	IM	**25–100 microg** Repeated at up to **50 microg** every **10 minutes**. **No maximum dose.**

Adult dosages *(cont.)*

• Significant pain
• Autonomic dysreflexia (with systolic BP > 160 mmHg)

ACP2	IV	≥ 70 yrs/cachectic or frail – **25 microg** Repeated at up to **25 microg** every **5 minutes**. **Total maximum dose 100 microg (or MME).** < 70 yrs – **25–50 microg** Repeated at up to **50 microg** every **5 minutes**. **Total maximum dose 200 microg (or MME).**
CCP	IV	**25–50 microg** Repeated at up to **50 microg** every **5 minutes**. **No maximum dose.**

Sedation

CCP	IV/IO	**25 microg.** Consider administration with midazolam. **Repeated PRN. No maximum dose.**

Induction for RSI

E CCP	IV/IO	*QAS Clinical Consultation and Advice Line* approval required in all situations. **1–5 microg/kg** **Single dose only.**

Paediatric dosages[2,4,5]

Significant pain

ACP1

NAS

Initial dose of fentanyl must be administered using the following scale.

Weight	Dose	Volume
10 – < 15 kg	20 microg	0.4 mL
15 – < 20 kg	25 microg	0.5 mL
20 – < 25 kg	30 microg	0.6 mL
25 – 30 kg	40 microg	0.8 mL
> 30 kg	45 microg	0.9 mL

Repeated once at **1 microg/kg at 10 minutes.**

Weight	Dose	Volume
10 – < 15 kg	10 microg	0.2 mL
15 – < 20 kg	15 microg	0.3 mL
20 – < 25 kg	20 microg	0.4 mL
25 – 30 kg	25 microg	0.5 mL
> 30 kg	30 microg	0.6 mL

Patients less than 1 year of age (10 kg) – *QAS Clinical Consultation and Advice Line* approval required

Paediatric dosages *(cont.)*

Significant pain

ACP2

NAS

≥ 1 year – **1.5 microg/kg**
Single maximum dose 50 microg.
Repeated once at **1 microg/kg** at **10 minutes**.
Total maximum dose 100 microg (or MME).

< 1 year – *QAS Clinical Consultation and Advice Line* approval required in all situations.

CCP

NAS

≥ 6 months – **1.5 microg/kg**
Single maximum dose 50 microg.
Repeated once at **1 microg/kg** at **10 minutes.**
Total maximum dose 100 microg (or MME).

< 6 months – *QAS Clinical Consultation and Advice Line* approval required in all situations.

ACP1 **ACP2** **CCP**

SUBCUT

QAS Clinical Consultation and Advice Line approval required in all situations.

ACP2

IM

≥ 1 year – **1–2 microg/kg**
Single maximum dose 50 microg.
Total maximum dose 2 microg/kg (or MME).

< 1 year – *QAS Clinical Consultation and Advice Line* approval required in all situations.

CCP

IM

≥ 1 year – **1–2 microg/kg**
Single maximum dose 50 microg.
Repeated at **1 microg/kg** (maximum 25 microg) at **10 minute** intervals.
No maximum dose.

< 1 year – *QAS Clinical Consultation and Advice Line* approval required in all situations.

Paediatric dosages *(cont.)*

Significant pain *(cont.)*

ACP2	**IV**	≥ 1 year – **1 microg/kg** Single maximum dose 25 microg. Repeated at **0.5 microg/kg** (maximum 25 microg) at **5 minute** intervals. **Total maximum dose 2 microg/kg (or MME).** < 1 year – *QAS Clinical Consultation and Advice Line* approval required in all situations.
CCP	**IV**	≥ 1 year – **1 microg/kg** Single maximum dose 25 microg. Repeated at **0.5 microg/kg** (maximum 25 microg) at **5 minute** intervals. **No maximum dose.** < 1 year – *QAS Clinical Consultation and Advice Line* approval required in all situations.

Paediatric dosages *(cont.)*

Sedation

CCP	**IV**	≥ 1 year – **1 microg/kg** Single maximum dose 25 microg. Consider administration with midazolam. **Repeated PRN. No maximum dose.** < 1 year – *QAS Clinical Consultation and Advice Line* approval required in all situations.
CCP	**IO**	≥ 1 year – **1 microg/kg** Single maximum dose 25 microg. Consider administration with midazolam. **Repeated PRN. No maximum dose.** < 1 year – *QAS Clinical Consultation and Advice Line* approval required in all situations.

Induction for RSI

ECCP	**IV**	*QAS Clinical Consultation and Advice Line* approval required in all situations.
ECCP	**IO**	*QAS Clinical Consultation and Advice Line* approval required in all situations.

Note: QAS officers are **NOT** authorised to administer fentanyl to paediatric patients presenting with cardiogenic chest pain.