additional doses can be given *by intravenous injection* during the intravenous infusion

- Child 12–17 years: 3–120 micrograms/kg/hour, dose to be administered according to anaesthetic technique and adjusted according to response, additional doses can be given *by intravenous injection* during the intravenous infusion

Spontaneous respiration: analgesia and enhancement of anaesthesia during maintenance of anaesthesia

- BY INTRAVENOUS INFUSION
- Child 12–17 years: Initially 2.4 micrograms/kg/hour, adjusted according to response; usual dose 1.5–6 micrograms/kg/hour

DOSES AT EXTREMES OF BODY-WEIGHT

- To avoid excessive dosage in obese patients, dose should be calculated on the basis of ideal body-weight.

- **UNLICENSED USE** Not licensed for use in children under 1 year.
- **CONTRA-INDICATIONS** Analgesia in conscious patients
- **INTERACTIONS** → Appendix 1: opioids
- **SIDE-EFFECTS**
- **Common or very common** Apnoea · muscle rigidity · post procedural complications
- **Uncommon** Hypoxia
- **Rare or very rare** Cardiac arrest
- **Frequency not known** Agitation · atrioventricular block · hypertension · seizure

SIDE-EFFECTS, FURTHER INFORMATION In contrast to other opioids which are metabolised in the liver, remifentanil undergoes rapid metabolism by plasma esterases; it has short duration of action which is independent of dose and duration of infusion.

Muscle rigidity Remifentanil can cause muscle rigidity that can be managed by the use of neuromuscular blocking drugs.

- **PREGNANCY** No information available.
- **BREAST FEEDING** Avoid breast-feeding for 24 hours after administration—present in milk in *animal* studies.
- **HEPATIC IMPAIRMENT** Manufacturer advises caution in severe impairment (limited information available).
- **RENAL IMPAIRMENT**

Dose adjustments No dose adjustment necessary in renal impairment.

- **DIRECTIONS FOR ADMINISTRATION**
- With intravenous use For *intravenous injection*, reconstitute to a concentration of 1 mg/mL; for *continuous intravenous infusion*, dilute further with Glucose 5% or Sodium Chloride 0.9% to a concentration of 20–25 micrograms/mL for child 1–12 years or 20–250 micrograms/mL (usually 50 micrograms/mL) for child 12–18 years.
- **PRESCRIBING AND DISPENSING INFORMATION**

Remifentanil should not be given by intravenous injection intra-operatively, but it is well suited to continuous infusion; a supplementary analgesic is given before stopping the infusion of remifentanil.

- **MEDICINAL FORMS** There can be variation in the licensing of different medicines containing the same drug.

Powder for solution for injection

- **Remifentanil (Non-proprietary)**

Remifentanil (as Remifentanyl hydrochloride) 1 mg Remifentanil 1mg powder for concentrate for solution for injection vials | 5 vial PoM £25.60 (Hospital only) CD2

Remifentanil (as Remifentanyl hydrochloride) 2 mg Remifentanil 2mg powder for concentrate for solution for injection vials | 5 vial PoM £51.13 (Hospital only) CD2

Remifentanil (as Remifentanyl hydrochloride) 5 mg Remifentanil 5mg powder for concentrate for solution for injection vials | 5 vial PoM £127.90–£131.74 (Hospital only) CD2

- **Ultiva** (Aspen Pharma Trading Ltd)

Remifentanil (as Remifentanyl hydrochloride) 1 mg Ultiva 1mg powder for solution for injection vials | 5 vial PoM £25.58 (Hospital only) CD2

Remifentanil (as Remifentanyl hydrochloride) 2 mg Ultiva 2mg powder for solution for injection vials | 5 vial PoM £51.15 (Hospital only) CD2

Remifentanil (as Remifentanyl hydrochloride) 5 mg Ultiva 5mg powder for solution for injection vials | 5 vial PoM £127.88 (Hospital only) CD2

1.4 Peri-operative sedation

Conscious sedation for clinical procedures

Overview

Sedation of children during diagnostic and therapeutic procedures is used to reduce fear and anxiety, to control pain, and to minimise excessive movement. The choice of sedative drug will depend upon the intended procedure and whether the child is cooperative; some procedures are safer and more successful under anaesthesia.

Midazolam p. 229 and chloral hydrate p. 302 are suitable for sedating children for painless procedures, such as imaging. For painful procedures, alternative choices include nitrous oxide p. 835, local anaesthesia, ketamine below, or concomitant use of sedation with **opioid** or **non-opioid analgesia**.

ANAESTHETICS, GENERAL › NMDA RECEPTOR ANTAGONISTS

Ketamine

14-Aug-2018

- **INDICATIONS AND DOSE**

Induction and maintenance of anaesthesia for short procedures

- BY INTRAMUSCULAR INJECTION
- Neonate: 4 mg/kg, adjusted according to response, a dose of 4 mg/kg usually produces 15 minutes of surgical anaesthesia.
- Child: 4–13 mg/kg, adjusted according to response, a dose of 4 mg/kg sufficient for some diagnostic procedures, a dose of 10 mg/kg usually produces 12–25 minutes of surgical anaesthesia
- BY INTRAVENOUS INJECTION
- Neonate: 1–2 mg/kg, adjusted according to response, to be given over at least 60 seconds, a dose of 1–2 mg/kg produces 5–10 minutes of surgical anaesthesia.
- Child 1 month-11 years: 1–2 mg/kg, adjusted according to response, to be given over at least 60 seconds, a dose of 1–2 mg/kg produces 5–10 minutes of surgical anaesthesia
- Child 12–17 years: 1–4.5 mg/kg, adjusted according to response, to be given over at least 60 seconds, a dose of 2 mg/kg usually produces 5–10 minutes of surgical anaesthesia

Induction and maintenance of anaesthesia for long procedures

- INITIALLY BY INTRAVENOUS INJECTION
- Neonate: Initially 0.5–2 mg/kg, followed by (by continuous intravenous infusion) 8 micrograms/kg/minute, adjusted according to response, doses up to 30 micrograms/kg/minute may be used to produce deep anaesthesia.