

## REMIFENTANIL

### Use

Remifentanyl is an ultra short acting opiate related to fentanyl (q.v.) that can be used to provide brief pain relief during operative procedures. It is always given IV.

### Pharmacology

Remifentanyl hydrochloride is a short-acting,  $\mu$ -receptor opioid agonist that was first developed in 1991. It achieves its peak analgesic effect within a minute of administration (three or four times faster than fentanyl, and very much faster than morphine). Unlike the other opioid drugs currently in clinical use it is rapidly hydrolysed by non-specific blood and tissue esterases within minutes into a biologically inactive carboxylic acid metabolite, 95% of which is then excreted in the urine. Indeed, it was specifically designed with these properties in mind. The half life, both in infancy and in later life, is just 5 minutes. Clinical recovery is, therefore, rapid, and it is thought that, because of this, many of the problems of drug dependence and progressive drug accumulation often seen with other opioid drugs can be avoided. Sustained use does however seem to cause tolerance to develop. A single IV dose provides pain relief within one minute that normally only lasts for 5–10 minutes irrespective of the magnitude of the dose given. As a result, sustained analgesia for longer operative procedures requires the administration of a continuous infusion. The commonest side effects of such use are nausea, vomiting and headache. While these problems are less often seen when midazolam (q.v.) is given as well, dual treatment significantly increases the risk of respiratory depression. High dose treatment quite often causes muscle rigidity of the type sometimes seen with fentanyl. Brief bradycardia is also not uncommon. The manufacturers have not yet recommended use in children less than a year old.

Little is yet known about the potential effect on the baby of maternal use during pregnancy or lactation but, given the drug's short biological half life, adverse effects seem unlikely. There is evidence, however, that use during operative delivery could cause brief neonatal respiratory depression.

### Pain Relief

**Sort term use:** A 1 microgram/kg dose given IV over a period of not less than 30 seconds provides substantial but short-lasting pain relief for 5–10 minutes.

**Sustained use:** Start by giving 1 microgram/kg per minute IV, and adjust as necessary to give 'real time' control over pain of variable intensity. Any dose high enough to provide pain relief tends to depress respiration so it should only be used as one component of a full anaesthetic strategy, and by a clinician prepared to take control of the airway if necessary (if that has not been done already).

### Antidote

Naloxone (q.v.) is an effective antidote, but remifentanyl's short half life should render use unnecessary.

### Compatibility

Remifentanyl can be added (terminally) to a line containing fentanyl, midazolam, or morphine.

### Supply and administration

Prescribing conventionally refers to the amount of remifentanyl base in any dose, and the product is supplied in vials, costing £5.50, that contain 1 mg of remifentanyl base. (1.1 mg of remifentanyl hydrochloride is approximately equivalent to 1 mg of remifentanyl.) Reconstitute the lyophilised powder with 1 ml of sterile water. Take 0.1 ml (100 micrograms) of this and dilute to 10 ml with 0.9% sodium chloride to obtain a solution containing 10 micrograms/ml for accurate low-dose administration. Storage and use are controlled under Schedule 2 of the UK Misuse of Drug Regulations (Misuse of Drugs Act, 1971).

### References

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