Guidelines for the administration of remifentanil IV infusion

Introduction

- Remifentanil is indicated for the provision of analgesia and sedation in mechanically ventilated patients 18 years of age and over. Its use must be authorised by an ICU Consultant
- Remifentanil should be administered only in a setting fully equipped for the monitoring and support of respiratory and cardiovascular function, and by persons specifically trained in the use of anaesthetic drugs. Such training includes the recognition and management of the expected adverse effects of potent opioids, including respiratory and cardiac resuscitation
- Remifentanil infusions must be discontinued prior to patient discharge from the ICU

Contra-indications

- As glycine is present in its formulation, remifentanil is contra-indicated for epidural and intrathecal use
- Patients with known hypersensitivity to any component of the preparation and other fentanyl analogues

Pharmokinetics

- Remifentanil is an opioid with a very short biological half-life that is susceptible to inactivation by non-specific blood and tissue esterases. There are no active metabolites. This means that its clearance is unaffected in renal or hepatic impairment or failure, therefore no dose adjustments is necessary
- In patients > 65 years: the initial starting dose should be half the recommended adult dose and then titrated to individual patient need. The calculated dose is based on ideal body weight

Preparation

- Remifentanil needs to be administered via a syringe-driver infusion pump. The drug is reconstituted using 0.9% sodium chloride or 5% glucose solutions
- An infusion concentration of 100 micrograms per ml is recommended
- Preferred method: using a 5mg vial, add 5mg to a total volume of 50ml
- If using 2mg vial, then add 6mg to a total volume of 60ml
- The drug is reconstituted using 0.9% sodium chloride or 5% glucose solutions

Safety considerations

- Due to its potency, remifentanil must be administered through a single, dedicated IV infusion line. Y-connectors must not be used
- Due to the short half-life i.e. 3 to 5 minutes, replacement syringes must be prepared at least an hour in advance. Replacement syringes must be changed immediately and within 3 minutes
- Bolus dosing of remifentanil is not recommended in the ICU setting
- Observe for hypotension and bradycardia with accidental overdose. In the event of over-administration, halve the infusion rate and review
- Care must be taken to avoid inadvertent bolus administration of the drug. When the infusion is completed, aspirate 1 to 2ml from the dead space of the redundant port, followed by a small bolus 2 to 5ml of 0.9% sodium chloride

Additional analgesia for ventilated patients undergoing uncomfortable procedures

- Remifentanil may be increased when patients undergo stimulating and/or painful procedures e.g. turning, position changes, tracheal suctioning, wound dressing changes and physiotherapy. Titrate to target CPOT score <3. Once the uncomfortable procedure is completed, it is recommended that the remifentanil infusion be titrated down again
- Dose adjustments may be made every 2 to 5 minutes in increments of 25 to 50% in anticipation of, or in response to additional requirement for analgesia

Recommendations for discontinuing remifentanil

- If other sedative infusions are used e.g. propofol, then they may need to be reduced or discontinued **before** reducing remifentanil
- The remifentanil infusion may be reduced by 1ml every 5 minutes until the infusion is discontinued. Due to the rapid offset action of remifentanil, no residual opioid activity will be present within 5 to 10 minutes after discontinuation. Where postoperative pain is anticipated, alternative analgesics must be administered at least 30 minutes prior to discontinuing remifentanil

Starting the infusion

- For patients **< 65** years: calculate ideal bodyweight and start remifentanil infusion at 6 micrograms/kg/hr
- For patients **> 65** years: calculate ideal bodyweight and start remifentanil are reduced dose of 3 micrograms/kg/hr
- Titrate remifentanil step-wise as required every 5mins until CPOT target < 3 or RASS target -1 to +1 is obtained

Remifentanil 100mcg/ml	Calculate ideal BW		50kg	60kg	70kg	80kg	90kg	100kg
	mcg/kg/min	mcg/kg/hr	ml/hr	ml/hr	ml/hr	ml/hr	ml/hr	ml/hr
Age > 65 years	0.05	3	1.5	1.8	2.1	2.4	2.7	3
	0.075	4.5	2.2	2.7	3.1	3.6	4.0	4.5
Age > 18 to 65	0.1	6	3	3.6	4.2	4.8	5.4	6
	0.125	7.5	3.7	4.5	5.2	6	6.7	7.5
	0.15	9	4.5	5.4	6.3	7.2	8.1	9
	0.175	10.5	5.25	6.3	7.3	8.4	9.4	10.5
	0.2	12	6	7.2	8.4	9.6	10.8	12
	0.225	13.5	6.7	8.1	9.4	10.8	12.1	13.5
Maximum rate	0.25	15	7.5	9	10.5	12	13.5	15

Remifentanil Infusion Rate Range for 100 micrograms/ml			
Bodyweight	Infusion rate range 18 to 65 years	Bodyweight	Infusion rate range for > 65 years
50kg	3 to 7.5 ml/hr	50kg	1.5 to 7.5 ml/hr
60kg	3.6 to 9 ml/hr	60kg	1.8 to 9 ml/hr
70kg	4.2 to 10.5ml/hr	70kg	2.1 to 10.5 ml/hr
80kg	4.8 to 12.0ml/hr	80kg	2.4 to 12 ml/hr
90kg	5.4 to 13.5ml/hr	90kg	2.7 to 13.5 ml/hr
100kg	6.5 to 15.0ml/hr	100kg	3 to 15 ml/hr

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