Remifentanil: Use as a Sedative in Critical Care

**Indications**
- Overnight ventilation
- Severe acute asthma
- Head injuries / patients with low GCS needing neurological assessment
- Difficult to wean patients
- Patients with renal or hepatic dysfunction

**Cautions**
- Remifentanil is very potent.
- **TREAT LIKE AN INOTROPE: DO NOT BOLUS!** For procedures increase infusion rate by 25%
- Overdose can cause bradycardia and hypotension. In event of over administration **halve rate** and review.
- Do not delay with syringe changes – have new syringe ready and start it within 3 min
- Consider administering alternate analgesia 30 minutes prior to discontinuing remifentanil infusion

**Flowchart**

1. **Commence Remifentanil infusion at 0.1 mcg/kg/min** (Use Ideal Body Weight)
2. Assess patient’s sedation and pain score
3. Increase or decrease remifentanil infusion rate by 0.025mcg/kg/min every 5 mins until desired sedation and/or pain score achieved.

- **Is remifentanil 0.2mcg/kg/min dose reached?**
  - **Yes**
    - **Is the patient adequately sedated?**
      - **Yes**
        - **Patient is in pain or ventilator intolerant**
          - Increase **remifentanil** rate by 0.025mcg/kg/min every 5 mins until adequate pain relief or **max dose of 0.5mcg/kg/min** has been reached
        - **Start propofol 2% at 1.5mL/hr**
          - Increase propofol by 0.5mL/hr every 5 mins until desired sedation score achieved or **max rate 10mL/hr** has been reached
          - **MEDICAL REVIEW**
      - **No**
        - **Patient is anxious or agitated**
          - **SEEK MEDICAL ADVICE**
            - If propofol 2% has reached 10mL/hr consider adding midazolam 0-5mg/hr
  - **No**
    - **Is the patient adequately sedated?**
      - **Yes**
      - **No**
**Preparation and administration**
Dilute 5mg of remifentanil to 50mL with sodium chloride 0.9% to give a 100microgram/mL solution. Administer using a syringe driver via a dedicated line. 
Administer via a central venous access device as the preparation has a low pH. If a central venous access device is unavailable, administer via a large peripheral vein and resite cannula at first signs of inflammation. 
Administration is licenced for 72 hours infusion only. IV lines should be aspirated before flushing after discontinuation.

**Example Calculation**
Administer 0.1mcg/kg/min to a patient with an ideal body weight of 70kg using a solution of 100mcg/mL: 
Remifentanil infusion rate (mL/hour) = \( \frac{0.1\text{mcg/kg/min} \times 70\text{kg} \times 60\text{mins}}{100\text{mcg/mL}} \) = 4.2mL/hour

**Calculate Ideal Body Weight (Devine formula)**
**Men:** Ideal Body Weight (in kilograms) = 50 + 2.3 kg per inch over 5 feet.
**Women:** Ideal Body Weight (in kilograms) = 45.5 + 2.3 kg per inch over 5 feet
Examples: 
Ideal body weight for a 6 foot 2inch man = 50kg + (2.3kg x 14) = 82.2kg
Ideal body weight for a 5 foot 6inch woman = 45.5kg + (2.3kg x 6) = 59.3kg

<table>
<thead>
<tr>
<th>Ideal Body Weight</th>
<th>Dose (mcg/kg/min)</th>
<th>Infusion Rate (mL/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40kg</td>
<td>0.6 1.2 1.8 2.4 3 3.6 4.2 4.8 12</td>
<td></td>
</tr>
<tr>
<td>50kg</td>
<td>0.75 1.5 2.25 3 3.75 4.5 5.25 6 15</td>
<td></td>
</tr>
<tr>
<td>60kg</td>
<td>0.9 1.8 2.7 3.6 4.5 5.4 6.3 7.2 18</td>
<td></td>
</tr>
<tr>
<td>70kg</td>
<td>1.05 2.1 3.15 4.2 5.25 6.3 7.35 8.4 21</td>
<td></td>
</tr>
<tr>
<td>80kg</td>
<td>1.2 2.4 3.6 4.8 6 7.2 8.4 9.6 24</td>
<td></td>
</tr>
</tbody>
</table>

**Extubation and discontinuation of Remifentanil**
To ensure a smooth emergence from a remifentanil-based regimen the infusion rate should be titrated in stages to 0.1 microgram/kg/min over a period up to 1 hour prior to extubation. Following extubation, the infusion rate should be reduced by 25% decrements in at least 10-minute intervals until the infusion is discontinued.
During weaning from the ventilator the remifentanil infusion should not be increased and only down titration should occur, supplemented as required with alternative analgesics.
When other opioid agents are administered as part of the regimen for transition to alternative analgesia, the patient must be carefully monitored. The benefit of providing adequate analgesia must always be balanced against the potential risk of respiratory depression.

**References**
Summary of Product Characteristics, Remifentanil, Wockhardt UK Ltd. Last updated 10/03/17 accessed via eMC on 26/4/18

The use of this guideline is subject to professional judgment and accountability. This guideline has been prepared carefully and in good faith for use within the Department of Critical Care at Brighton and Sussex University Hospitals. The decision to implement this guideline is at the discretion of the on-call critical care consultant in conjunction with appropriate critical care medical/nursing staff.

Date: MGG July 2019 Review: July 2021   Page 2 of 2   Authors: FB/JW