

## SEDATION, ANALGESIA AND NEUROMUSCULAR BLOCKADE

### Pain

Assessment:

verbal rating scale, visual analogue scale, clinical observation

Agents recommended:

morphine, fentanyl IV (continuous/ regular/ prn/ PCA)

Other agents can be considered: paracetamol

NSAID with caution and discuss with senior (monitor RFT and GI bleed)

Regional techniques and difficult cases – consult pain team

If pain seems out of proportion – must consider other organic causes e.g. wound pain v.s. peritonitis

### Sedation

Indications:

- facilitate management of anxious and agitated patients

Important to exclude treatable causes:

Pain, discomfort, sleep deprivation, drug withdrawal,

Breathing difficulties (blocked tubes, inappropriate ventilator settings etc.),

Organic problems (electrolyte abnormalities, acid-base abnormalities, glucose, renal failure, liver failure, stroke etc.)

Assessment:

GCS, clinical observation, sedation scores (eg. Ramsay Sedation Score)

Agents recommended:

Propofol and Midazolam for short term

(propofol – start with 3mg/kg/hr)

Lorazepam preferred agent for long term treatment

2mg Q4-6h)

Haloperidol preferred agent for delirium

(2.5 -5mg Q15min max 25mg, avoid in patients with prolonged QTC)

Morphine + Midazolam infusion is commonly used in our unit (known in the unit as M&M)

watch out for haemodynamic and respiratory side effects after starting sedation

Dexmedetomidine - new  $\alpha_2$  agonist with sedative and analgesic property

Over-sedation and under-sedation both have problems.

The level of sedation required may differ with different severity of the illness.

For most patients, the targets of sedation are to relieve anxiety, promote sleep, facilitate nursing care and ventilation. Ideally, the patient should be easily aroused.

For other patients e.g. patients with increased intracranial pressure, patients difficult to be ventilated, full sedation may be necessary.

### Ramsay Sedation Score

Clinical score	Patient characteristics
1.	Anxious, agitated or restless
2.	Cooperative, oriented and tranquil
3.	Sedated but responds to commands
4.	Asleep; brisk response to light glabellar tap or loud auditory stimulus
5.	Asleep; sluggish response to light glabellar tap or loud auditory stimulus
6.	Asleep; no response to painful stimulus

### Neuromuscular Blockade

#### Indications:

1. facilitate intubation
2. facilitate mechanical ventilation
3. management of increased intracranial pressure (especially when the patient is coughing, hiccoughing and shivering despite increasing sedation)

#### Agents commonly used in our ICU:

- suxamethonium (for intubation)  
remember the contraindications:  
hyperkalaemia  
burns >24hours  
certain muscle disease  
allergies/ history of malignant hyperthermia
- atracurium  
intubation: 0.4-0.5mg/kg  
maintenance: 0.3-0.6mg/kg/hr
- rocuronium  
intubation: 0.6mg/kg  
maintenance: 0.3-0.6/kg/hr

#### Monitoring:

- nerve stimulator – adjust blockade to 1-2 twitches
- other observations include pressure points, ocular care, DVT prophylaxis
- concomitant use of nondepolarizing muscle relaxants and steroids have been implicated in the development of acute necrotizing myopathy

- discontinue use of muscle relaxant as soon as possible
- monitor CPK

*Reference:*

1. Sedation, analgesia, and neuromuscular blockade of the critically ill adult:  
Revised clinical practice guidelines for 2002  
*Critical Care Medicine* Jan 2002