

Sedation Guideline

Introduction

The correct management of sedation is one of the most important aspects of Intensive Care management. Unfortunately it is also one of the most difficult, mainly because patients cannot communicate easily how they feel and what they need to feel better. Some degree of sedation (i.e. analgesia ± hypnosis) is often required to allow patient co-operation with organ system support and the associated nursing care. An agitated patient has a higher basal metabolic rate and may reduce the efficiency of supportive care, most commonly ventilation.

While it is clear that leaving a patient agitated and distressed is detrimental to their care this is equally true of over sedation. All sedative agents share the following problems;

- i. accumulation with prolonged infusion, delaying weaning from supportive care increasing complications and consequently morbidity and mortality
- ii. detrimental effects on the circulation leading to increased inotrope requirements
- iii. detrimental effects on the pulmonary vasculature. increasing VQ mismatch leading to increased ventilatory support with the consequent increase in complications
- iv. tolerance during sedation and withdrawal when it is stopped
- v. no sedative provides rapid eye movement (REM) sleep - i.e. useful sleep. REM sleep deprivation is thought to be one of the most important causes of ICU psychosis
- vi. reduced intestinal motility impairing establishment of enteral feeding

It is therefore vital that sedation is managed as precisely as possible and given the priority attention that it deserves.

Aims

1. **All patients must be comfortable and pain free.** Analgesia is thus the first aim.
2. **Anxiety should be minimised.** This is difficult as anxiety is an appropriate emotion. The most important way of achieving this is to provide compassionate and considerate care; communication is an essential part of this.
3. **Patients should be calm, co-operative and able to sleep when undisturbed.** This does not mean that they must be asleep at all times.
4. Patients must be able to tolerate appropriate organ system support. Thus patients with very poor gas exchange, particularly those requiring inverse I:E ratios or the initial stages of permissive hypercapnoea may need neuromuscular blockade *it is impossible to stop interbreathing with sedatives without serious overdose*. The use of a nerve stimulator to monitor the extent of neuromuscular blockade may be useful in some situations.
5. **Patients must not be paralysed and awake.**

Remember - before increasing sedation or adding neuromuscular blockade:

- i. Any avoidable source of physical discomfort should be excluded.
- ii. The need for any uncomfortable or disturbing therapies should be reviewed.
- iii. A perceived need to increase sedatives may be an index of clinical deterioration.
- iv. When sedation has been stopped night sleep is often fitful because of rebound REM sleep. Continued night sedation may prolong this rather than treating it.
- v. Non drug measures (e.g. massage etc.) should be considered.

Principles of Management

A drug given by intravenous infusion will take four half-lives to achieve steady state levels. This means that it will take some time for adequate sedation to be achieved by starting an infusion without a loading dose. It also means that changes in sedation infusion rate will take some time to be effective. As a result there is a tendency for infusion rates to be started at a high rate in order to achieve adequate sedation quickly. Unfortunately, this high initial rate is often continued in the mistaken belief that it will continue to be needed. This also applies to increases in infusion rate which tend to be too great.

The correct way to initiate sedation is thus to administer a loading dose which is titrated to effect and then to start an infusion. Increases in sedative infusion rate should follow the same principle, i.e. a bolus, titrated to effect, should be administered and the infusion rate increased by a small increment.

A commonly used analogy to simplify the understanding of these principles is that of the leaking bucket. In order to fill the bucket a bolus of water is required. The size of this bolus is independent of the size of the leak. However in order to keep the bucket full an infusion rate which is equal to the size of the leak is required. If the infusion is started with no bolus then the bucket will never fill.

It is important to remember that combinations of sedatives that act via different mechanisms are more effective than single agents at high dose. In addition, tolerance to sedatives develops more quickly at high doses. Alternative sedative agents may need to be considered.