Sedation assessment using the Ramsay scale

Rachel Dawson and colleagues review the reliability of tools for assessing sedation and how these differ from methods of measuring consciousness.

Summary

Patients undergoing sedation in emergency departments (EDs) must be monitored carefully to ensure that, when they are being transferred to different departments, they are safe and that information about them is accurate. However, sedation scoring, for which several tools are available, should not be confused with assessment of consciousness, which is undertaken using the Glasgow Coma Scale. This article considers the validity and reliability of sedation scoring tools, and discusses how ED staff can choose and integrate them into patient care pathways.

Keywords
Sedation scoring tools, Ramsay sedation scale, critically and acutely ill adults

THERE IS much discussion in the literature on the use of the Glasgow Coma Scale (GCS) in emergency departments (EDs) but little about the use of sedation score assessments.

This emphasis on the GCS can lead staff to attend too much to measuring patients' levels of consciousness rather than their levels of sedation.

According to Soanes et al (2006), sedation is the administering of a sedative drug to produce a state of calm or sleep, or a state of calm or sleep produced by a sedative.

Patient sedation, therefore, is a medically induced state instigated to facilitate procedures or care, and assessments of patients' sedation levels concern their levels of sleep rather than their levels of consciousness.

It is therefore open to question whether the GCS, which is commonly used to assess patients' levels of consciousness or 'arousability', possibly in response to changes in environmental stimuli, is appropriate for assessing sedated patients (Gill et al 2005).

This is important because, by using the correct tool, ED practitioners can ascertain accurately and reliably whether patients are unconscious or sedated.

The sedation of patients in EDs is usually either procedural or therapeutic.

Procedural sedation This is used to prevent the discomfort associated with invasive or painful procedures such as relocation of dislocated joints (Mallett and Dougherty 2000). It minimally depresses patients' levels of consciousness but allows them to maintain their own airways and respond purposefully to verbal commands with or without light tactile stimulation (O'Donnell et al 2003).

Therapeutic sedation This is used to control agitation, intracranial pressure or seizures (McConachie 2006), or to prevent self-harm (Hillman and Bishop 2004). It is also used to minimise distress, anxiety and pain in patients who are critically ill (Bion 1999) until diagnoses are made and treatments instigated, and the patients concerned are admitted to inpatient or critical care beds.

Patient safety

As Hillman and Bishop (2004) advise, patient safety and comfort are compatible with the lightest level of sedation combined with good analgesia, and so provision of the appropriate analgesia can reduce the need for sedation.

Practitioners must be aware that variables in patients' conditions can influence the effectiveness of administered sedatives (Shelly 1998) so previous problems or reactions to sedation or analgesia should be recorded and addressed.

Drug kinetics and dynamics can be altered by: body mass index; medication, including use of non-prescription medication; use of drugs, alcohol or tobacco; snoring or sleep apnoea (O'Donnell et al 2003); and impaired hepatic or renal function.
(Bion 1999), so all of these should be recorded before sedation is administered.

Practitioners should be aware, however, that the conditions of patients may be such that some of this information is difficult to obtain in the ED.

Practitioners must also consider the implications of their choice of sedatives, their rapidity of onset and duration of action, and the rapidity of patient recovery. They should also be aware that most sedatives have minimal adverse side effects and are metabolised quickly.

In delivering prescribed sedation, the use of valid sedation assessment tools promotes safe practice, and the repeated use of sedation scores helps to ensure that documentation is kept up to date and that the cumulative effects of sedation on patients' cognitive states are minimised. Such effects, which include residual amnesia, can increase the lengths of hospital stay.

**Sedation scoring tools**

The literature reveals that, between 1996 and 1999, 25 sedation assessment tools were published, of which three have been rigorously tested for validity and reliability in adults: the motor activity assessment scale (MAAS), the Ramsay sedation scale and the sedation agitation scale (SAS) (De Jonghe et al. 2000).

Since 1999, other scales, including the adaption to the intensive care environment scale (ATICE) (De Jonghe et al. 2003) and the Richmond agitation scale (RAS) (Sessler et al. 2002), have been validated and are used in some critical care areas.

Research shows that the SAS has been consistently rated as reliable (Clemmer et al. 2000), possibly because it comprises only one item, with a response option ranging from one to seven (Riker et al. 1994). The MAAS, which also receives consistent ratings for reliability, is an adaptation of the SAS and also comprises only one item.

De Jonghe et al. (2000) systematically reviewed 25 studies involving 900 patients to measure the effectiveness of the MAAS, Ramsay and SAS scales in evaluating consciousness level, sedation level and the side effects of sedation, but not the ability to detect change in responsiveness over time.

The reviewers also noted that the scales could be used to evaluate agitation, pain and anxiety, as well as reactions to endotracheal aspiration, although this can be inappropriate in the care of sedated patients.

Their study can be criticised, however, because, of the three scales under review, only the Ramsay scale had been validated adequately for use in the critical care environment.

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**Table 1: Ramsay sedation scale**

<table>
<thead>
<tr>
<th>Observation</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
<td>Patient is anxious and agitated, restless or both</td>
<td>1</td>
</tr>
<tr>
<td>Patient is co-operative, oriented and tranquil</td>
<td>2</td>
</tr>
<tr>
<td>Patient responds to commands only</td>
<td>3</td>
</tr>
<tr>
<td>Patient exhibits brisk response to light glabellar tap or loud auditory stimulus</td>
<td>4</td>
</tr>
<tr>
<td>Patient exhibits a sluggish response to light glabellar tap or loud auditory stimulus</td>
<td>5</td>
</tr>
<tr>
<td>Patient exhibits no response</td>
<td>6</td>
</tr>
</tbody>
</table>

(Adapted from Anaesthesia UK 2010)

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When deciding on the most appropriate sedation assessment tool for use in EDs, practitioners should bear in mind that reliability studies, like those mentioned above, are largely generalised to critical care, where patients have different requirements from those cared for in EDs.

Few tools exhibit satisfactory 'clinimetric' properties, or measurable clinical parameters, and clinicians should know more about the tools before making informed appraisals of them.

Holdgate et al. (2006) reveal a lack of consistency between doctors and nurses, and between different cohorts of professionals, in assessments of consciousness or sedation levels. The introduction of a simple tool, therefore, can ensure such assessments are reliable as long as the difference between assessments of sedation and consciousness is clear.

In this context, Hansen-Flaschen et al. (1994) and De Jonghe et al. (2003) identify the six-point Ramsay sedation scale as the only tool that is validated adequately for use in clinical practice.

Other research highlights that the Ramsay scale is the most widely used scale sedation level assessment in practice and research (Carrasco et al. 1998).

**Ramsay sedation scale**

The Ramsay sedation scale comprises two, clearly defined groups of scores: those of 1, 2 and 3 are given in assessing degrees of wakefulness, and those of 4, 5 and 6 are given in assessing degrees of sleep (Table 1).

The six levels of the Ramsay sedation scale allow for visual assessments of sedation in patients who are responsive to such assessments. Clinicians can use the scale to assess patients' sedation level,
and record and use the scores to guide them in ascertaining the need to alter medications.

For example, patients with a Ramsay scale score of 2 can be considered to have attained the optimal sedation level at which they are calm, co-operative and, most importantly, comfortable (Waldeman 2010). The scale is reliable and its results produce good inter-observer agreement and can be reproduced for clinical practice.

The Ramsay scale can be introduced for trial, therefore, in the EDs of trusts in which it is used in critical care services.

Trusts that are considering implementation of sedation scales must analyse cost implications, including those related to staff training.

Because the Ramsay scale is similar to the GCS, however, it can be implemented in EDs without the need for extensive training of ED staff, although the purpose and correct use of the scale, and the difference between scales for assessing consciousness and sedation, must be explained carefully before such implementation.

Although sedation levels are identified in the Ramsay scale, they are not defined clearly or conclusively, so the scale can be modified by implementing trusts to expand areas of assessment, ensure consistency between clinical areas and promote seamless safe care of sedated patients.

**Conclusion**

Sedation is an essential therapeutic practice but it can pose dangers to patients such as inability to maintain airways, confusion, hypotension, bradycardia, respiratory depression and an increased risk of ventilator-acquired pneumonia.

Sedation levels must therefore be monitored and documented clearly and consistently while patients are in EDs (O’Donnell et al 2003).

Assessment of critically ill patients in any environment should be thorough and consistent, however, and trust-wide implementation of a recognised sedation score can provide valuable information during transfer of patients to acute and critical care departments.

Agitation and pain can be difficult to detect in paralysed or sedated patients who are critically ill, and that some sedation scoring systems depend on motor responsiveness and patient co-operation (Rampil 1998).

Practitioners must therefore assess physiological signs such as heart rate and blood pressure. These markers can be influenced by clinical and environmental conditions, which must therefore be taken into account in sedation assessments.

The use of a specific valid scale such as the Ramsay sedation scale ensures continuity of care and promotes the safe practice of scoring sedated patients consistently. It also provides auditable data.

Use of the Ramsay sedation scale in EDs also supports consciousness scoring undertaken using the GCS, and provides clinical data that can prevent over- and under-sedation of patients who are acutely or critically ill. In addition, when patients are transferred to other departments or units, their sedation status must be communicated to colleagues in a meaningful and valid way to ensure their safety.

**Implications for practice**

Continuity of care for sedated patients is paramount and, with the use of sedation scales increasing in critical and acute areas, use of the Ramsay scale at the point of sedation delivery should ensure that records of sedation levels are accurate, thereby promoting patient safety.

This article has been subject to double blind review.

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**References**


