Keeping the score

To the Editor:

In a recent editorial, *"The Recovery Room… a safe haven, or a disaster waiting to happen?"* (SAJAA 2009, Volume 15, Number 2, April/May), the topic of ensuring a safe and satisfactory recovery period for our patients was revisited. In 2003, research from a group in Vancouver relating to discharge readiness after outpatient anaesthesia was published in SAJAA.[1]

The Post-Anesthetic Recovery Score (PARS), first introduced by Aldrete in 1970, represents an extension of the observations made by Dr Virginia Apgar in her universally accepted guide to scoring the vital systems of the newborn (**A**ctivity, **P**ulse, **G**rimace, **A**ppearance, **R**espiration).[2] Two significant changes in the practice of anaesthesia merited modifications, in 1995, to the original PARS. "*Color*" as one of the original clinical signs was replaced by "*O_2 saturation*". This despite "color" as clinical sign at the time being described as "*an objective sign relatively easy to judge*".[2] The second change related to the provision of criteria for discharge from the Post Anaesthesia Care Unit (PACU) following ambulatory surgery.

From 5 – 9 of April 2010, yet another FCA (SA) Part II Clinical Course and mock exam was held at the two main teaching hospitals (Kalafong and Steve Biko) of the Department of Anaesthesiology of the University of Pretoria. This annual event is aimed at those preparing for the upcoming FCA Part II examinations, although some candidates indicated their intention of only taking the examination later. The course was attended by some 34 registrars from most academic departments of anaesthesiology in South Africa. It was quite disturbing (if not embarrassing) that no candidate (from a random selection) who was questioned on criteria for the safe discharge of patients from the anaesthetic recovery room to the ward was able to recall all five criteria set out by Aldrete. In addition, none could recall the numerical value attached to each clinical sign. In this regard it is interesting to note that it was recognised at the time of the publication of the original article that, to be practical, a method of evaluating patients in the immediate post-operative period had to be simple and "*easy to memorize*". This certainly is not reflected in our experience.

For a number of years now, in our recovery room at Kalafong Hospital, we have used a modification of the modified Aldrete score. This is in the form of a large

Recovery room discharge criteria: Kalafong Hospital

	Score
Airway	
$Sp0_2$ > 92% breathing room air	2
$Sp0_2$ > 90% with supplemental 0_2	1
$Sp0_2$ < 90% with supplemental 0_2	0
Activity**	
Moving all limbs voluntarily or on command	2
Moving two limbs voluntarily or on command	1
Unable to move extremities voluntarily or on command	0
Breathing	
Able to breath deeply and cough freely	2
Dyspnoea, shallow breathing	1
Apnoea	0
Blood pressure	
± 20% from preoperative systolic	2
20-50% from preoperative systolic	1
± 50% from preoperative systolic	0
Consciousness	
Fully awake	2
Arousable on calling	1
No response	0
	Total*

* Absolute minimum required for discharge = 9
** Keep in mind effects of regional techniques

Adapted from: Aldrete JA: the Post-Anesthesia Recovery Score Revisited. J Clin Anesth 1995:7:89

poster in the recovery room, prominently displayed where all involved in postoperative care can easily see it. The day after the clinical course in question, I asked some of the recovery room nursing staff similar questions on recovery room criteria, and found their knowledge relating specifically to the Aldrete score to be equal to, or exceeding that, of some of our future anaesthesiologists. Our hospital's modification – which in no way alters the clinical signs utilised, nor the numerical value attached to the signs – is aimed *only* at **improving retention of memory** and involves a simple rearrangement of the sequence of the five signs in an "ABC" type format. Since the activity observed and scored is the act of breathing (and not O_2 utilisation at cellular level), "respiration" has been substituted with "breathing", and since the vital sign measured and scored is blood pressure (and not cardiac output), "circulation" was replaced with "blood pressure".

Numbers attached to specific clinical signs (as opposed to the bigger picture) must never be the sole or final determinant of ward-readiness, but the PARS (even with its limitations) is a guide that all anaesthetists should be familiar with. And of course, the data contained in this guide should be easy to

retain. Our modification to the modified Aldrete score evidently provides just that.

Alberts A, FCA (SA)
Department of Anaesthesiology and Critical Care, Faculty of Health Sciences, University of Pretoria
Correspondence to: Dr Andrie Alberts, e-mail: Andrie.Alberts@up.ac.za

References

1. Vaghadia H, Cheung K. A quantification of discharge readiness after outpatient anaesthesia: patients` vs. nurses` assessment. S Afr J Anaesthesiol Analg. 2003;9(4):5–9.
2. Aldrete AJ, Kroulik D. A postanesthetic recovery score. Anesth Analg. 1970;49(6):924–933.

Sedation guidelines: a record of sedation scores is essential

To the Editor:

Publication of the SASA Sedation Guidelines 2010[1] (the Guidelines) is a welcome update. There is however a glaring deficiency, namely that no mention is made of the importance of regular assessment of the degree of sedation during procedures. Furthermore, there is no provision made for the writing down thereof on the included "Sedation-Monitoring Chart".

It is well-known that as depth of sedation progresses from light to deep sedation, the airway becomes increasingly compromised and the likelihood of respiratory and cardiovascular depression increases. The same degree of intensive care that is applied to other organ systems should be applied to the management of sedation.[2] It is imperative that every practitioner should carefully evaluate and assiduously record the degree of sedation at regular intervals using a generally-accepted scoring system. Indeed, whereas the American Pain Society has declared a pain scale to be the fifth vital sign,[3] a sedation scale should be the sixth vital sign for patients receiving continuous infusions of sedatives or opioids.[2] From a medicolegal point of view it is crucial to have an accurate sedation scoring record during and after a procedure that has been conducted using "conscious sedation".

Provision should be made for sedation scoring on the printed "Sedation-Monitoring Chart" that appears in the guidelines, for which there is ample space if some of the unnecessary recordings are eliminated from the chart. These include the sections entitled "Previous Operations/Sedation/GA", "Complications", "Allergies", "Medical History", and "Medication" which are not required because those items will have been recorded in the Medical History Questionnaire and/or the Pre-procedural checklist.

Two widely accepted sedation scoring systems are the Ramsay Sedation Scale[4] and a modified Observer's Assessment of Alertness/Sedation scale (OAA/S).[5;6] The Ramsay Sedation Scale is a six-point scale and is depicted in Table I.

Michael Ramsay explains the use of his scale as follows[7]: "*The RSS defines the conscious state from a level 1: the patient is anxious, agitated or restless, through the continuum of sedation to a level 6: the patient is completely unresponsive. Therefore when an assessment is to be made, the first decision to be made is to note if the patient is awake. If the patient is awake: are they anxious, agitated or restless (RSS 1) or are they calm, co-operative and communicative (RSS 2)? If the patient is asleep then a test of reusability needs to be made. If the patient responds quickly to a voice command, this is a RSS 3. If the response is slow then the patient is assigned a level 4. If the patient does not respond a stronger stimulus is applied. A louder auditory stimulus or a glabellar (between the eyebrows) tap is enacted. A brisk response to this test of rousability places the patient at a RSS 4. A slow or sluggish response categorizes the patient to a RSS 5. No response at all places the patient at a level 6.*

The rousability stimulus was specifically designed not to be a painful test and not to startle the patient. In fact it was planned that a sleeping patient would not be roused to a fully awakened state, so that the sleep pattern would not be disturbed."

Table I: The Ramsay Sedation Scale

1.	Anxious and agitated or restless, or both
2.	Co-operative, oriented, and calm
3.	Responsive to commands only
4.	Exhibiting brisk response to light glabellar tap or loud auditory stimulus
5.	Exhibiting a sluggish response to light glabellar tap or loud auditory stimulus
6.	Unresponsive

The Observer's Assessment of Alertness/Sedation scale (OAA/S) is a six-point scale ranging from 5 to 0 that involves eliciting a response to increasingly intense stimuli that begin with speaking with a normal voice to prodding or shaking and finally to a painful stimulus (trapezius squeeze). The modified OAA/S responsive scale[6] is depicted in Table II.

Table II: The Modified OAA/S Responsive Scale

5. Responds readily to name spoken in normal tone
4. Lethargic response to name spoken in normal tone
3. Response only after name is called loudly and/or repeatedly
2. Response only after mild prodding or shaking
1. Response only after painful trapezius squeeze
0. No response after painful trapezius squeeze

Patients are considered responsive at an OAA/S level of 5, 4 or 3 and and are scored as unresponsive at an OAA/S level 2, 1 or 0. Patients are considered to have loss of consciousness (LOC) at the transition between level 3 and level 2.[8]

Choice of sedation scoring system is a matter of personal preference. The Ramsay scale was developed in the 1970s in order to promote adequate sedation in intensive care units. The OAA/S scale is directed at determining the degree of suppression of consciousness and is widely used in anaesthesia research literature for quantifying the hypnotic effects of drugs. The two methods differ in that whereas the Ramsay scale mainly involves a passive approach to the patient, designed to cause minimal disturbance to sleep, the OAA/S scale entails a positive action by the observer *ab initio*, in order to determine the patient's responsiveness. In addtion, the numerical scales are entirely different in that whereas the Ramsay scale scores the *degree of sedation* (fully awake = 1; unresponsive = 6), the OAA/S scores the *degree of responsiveness* (fully responsive = 5; unresponsive = 0).

I suggest that both sedation scales be printed on the back of the "Sedation-Monitoring Chart" for quick reference and to ensure that sedationists should have no doubt in their minds with regard to scoring. Furthermore provision should be made on the chart for indicating which scoring method the sedationist has chosen, so that there can be no doubt afterwards as to which system was used.

The foreword to the Guidelines mentions that the next revision is due to take place in 2015. This is too long a period to rectify such an important flaw. I suggest that this letter be published in the following SAJAA in an effort to draw the attention of sedationists and that the Guidelines be revised and reprinted. Meanwhile an *erratum* should be printed and inserted into existing copies of the Guidelines.

Coetzee JF, BSc, MBChB, MMed(Anes), FCA(SA), BSc, PhD
Department of Anesthesiology and Critical Care, Faculty of Health Sciences, Stellenbosch University
Correspondence to: Prof JF Coetzee, e-mail: jfc@sun.ac.za

References

1. South African Society of Anaesthesiologists. SASA Sedation Guidelines 2010. Southern African Journal of Anaesthesia and Analgesia 2010;16:S1–S25.
2. Ramsay MA. Measuring level of sedation in the intensive care unit. JAMA 2000;284:441–2.
3. Quality improvement guidelines for the treatment of acute pain and cancer pain. American Pain Society Quality of Care Committee. JAMA 1995;274:1874–80.
4. Ramsay MA, Savege TM, Simpson BR, Goodwin R. Controlled sedation with alphaxalone-alphadolone. Br Med J 1974;2:656–9.
5. Chernik DA, Gillings D, Laine H, et al. Validity and reliability of the Observer's Assessment of Alertness/ Sedation Scale: study with intravenous midazolam. J Clin Psychopharmacol. 1990;10:244–51.
6. Glass PS, Bloom M, Kearse L, Rosow C, Sebel P, Manberg P: Bispectral analysis measures sedation and memory effects of propofol, midazolam, isoflurane, and alfentanil in healthy volunteers. Anesthesiology 1997;86:836–47.
7. Ramsay MA. How to use the Ramsay Score to assess the level of ICU sedation. 2001 Ref Type: Internet Communication.
8. Vanluchene AL, Struys MM, Heyse BE, Mortier EP: Spectral entropy measurement of patient responsiveness during propofol and remifentanil. A comparison with the bispectral index. Br J Anaesth 2004;93:645–54.

Response to "Sedation guidelines: a record of sedation scores is essential"

To the Editor:

Thank you for giving us the opportunity to reply to Professor Coetzee's letter. We appreciate constructive advice regarding the South African Society of Anaesthesiologists (SASA) adult guidelines for procedural sedation and analgesia.[1] However, we disagree that the omission of subjective sedation scoring systems is a "glaring deficiency" or an "important flaw" as the author suggests. Neither do we agree that the sedation scoring systems are essential, although we believe that they are desirable.

The South African guidelines are based on internationally respected guidelines, namely those of: the American Society of Anesthesiologists,[2] the Royal College of Anaesthetists,[3] the Australian and New Zealand College of Anaesthetists,[4] and the Scottish Intercollegiate Guidelines Network (SIGN)[5] whose paediatric guidelines are, perhaps, the

most comprehensive of all. None of these carries recommendations of sedation scoring systems. Indeed, the ASA guidelines state that "the literature is silent regarding whether monitoring the patients' level of consciousness improves patient outcome or decreases risk", although they then go on to state that "the consultants strongly agree that monitoring the level of consciousness reduces risk for both moderate and deep sedation".

We support the consensus expert opinion that there is value in the regular assessment of the degree of sedation, despite the literature not supporting this. Professor Coetzee mentions the value of regular assessment of the degree of sedation, but claims that this is not mentioned in the guidelines. In the section of the guidelines on standards of monitoring, it is clearly indicated that the levels of consciousness must be evaluated and documented.[1] In sedation terms, the level of consciousness (LOC) is synonymous with the level of sedation.

With regard to the levels of sedation, the guidelines are clear in their definitions, i.e. moderate sedation means response to verbal response and/or tactile stimulation. This amounts to evaluation of the level of consciousness and is widely accepted by sedation practitioners.

In order for a scoring system to be of practical use in the clinical setting, it must be simple to understand and use, easily reproducible and reliable. Many of the scoring systems in use are cumbersome and impractical for use outside the research setting.

The Modified Observer's Assessment of Alertness and Sedation (MOOA/S)[6] and the Ramsay scale[7] (detailed by Professor Coetzee) are not interchangeable with the SASA definitions of the levels of sedation,[1] as they do not take into account the cardiorespiratory status, and there is subjectivity as to what MOAA/S means by moderate and deep sedation.[6] It is crucial that we should seek for a uniform assessment and then a subsequent assignment of a sedation scale scoring system.

The MOAA/S also evaluates loss of consciousness with "mild prodding or shaking". The idea of sedation is to have a comfortable, relaxed patient. The anxious patient usually does not respond kindly to "shaking and prodding". It must also be noted that both the MOAA/S and the Ramsay scales have six points to consider for evaluation of LOC, which makes them cumbersome and impractical tools for daily clinical use. Although they are currently used by some clinicians to assess the level of consciousness, they are largely outdated and have been superseded by more appropriate, practical scoring tools. In addition, the reliability and validity of the Ramsay sedation score has not been reported.[8]

The Bispectral Index (BIS) monitor has been validated as an objective measure of the LOC in the operating room, although its value in settings other than general anaesthesia remains unclear.[9] Perhaps one of the best objective scoring tools of the LOC is the Wilson Sedation Scale.[10] There is minimal disturbance of the patient when evaluating the LOC, with no shaking or prodding of the patient (Table I).

A two-year investigation into the "Efficacy and safety of propofol, remifentanil and midazolam for minor outpatient orthopaedic surgery under procedural sedation and analgesia" has been recently completed as a Masters thesis by a postgraduate student in sedation and pain control at the University of the Western Cape. One of the objectives of the study was to see if the sedation scoring values, according to the Wilson Sedation Scale, correlate with the values of the BIS as to LOC. Statistical analysis shows that a BIS valu e of 78 correlates with the Wilson Sedation Scale of 2; a BIS value of 73 correlates with the Wilson Sedation Scale of 3, and a BIS value of 68 correlates with a Wilson Sedation Scale level of 4. In our clinical setting, the Wilson scale is probably the best subjective sedation scoring system to evaluate LOC.

Table I: The Wilson Sedation Score

Score	Description
1.	Fully awake and oriented
2.	Drowsy
3.	Eyes closed but rousable to command
4.	Eyes closed but rousable to mild physical stimulation (earlobe tug)
5.	Eyes closed but unrousable to mild physical stimulation

The University of Michigan scoring system (UMSS) was originally developed for children but has been widely adopted for use in adult sedation practices.[11] A copy of this scoring system can be found in the forthcoming South African Guidelines for Procedural Sedation and Analgesia in Paediatrics.

We do not agree with Professor Coetzee that "unnecessary recordings" (previous operations, complications, etc) on the "Sedation-Monitoring Chart" must be eliminated. A copy of this chart should remain in the patient's folder at the facility where the sedation is performed. The medical history questionnaire/ preprocedural checklist is usually completed and

kept by the sedation practitioner and may not be available at the sedation facility. We therefore believe that duplication of important information is warranted. Professor Coetzee has requested that a copy of both the MOAA/S and the Ramsay scale be printed on the back of the sedation chart. For the reasons outlined above we believe that this is unnecessary. In addition, the cumbersome nature of these scoring systems means that the sedation practitioner would have to look at 12 different scores in order to evaluate the LOC.

We wish to state that the authors of the SASA guidelines did not review a final copy / galley proof of the guidelines prior to their submission for printing, although this would not have changed the deliberate omission of a sedation scoring system. In the light of Professor Coetzee's comments and our attempt to produce what are surely the leading, most comprehensive guidelines in the world, the revised guidelines will contain an appendix which details the Wilson Sedation Scale.

[a] **Roelofse JA**, MBChB, MMed (Anaes), PhD, Diplomate of the NDBA (USA)
[b] **Piercy JL**, BSc(Hons), MB BS (Lond), FCA (SA), Cert Crit Care (SA)

[a] Professor and Head of Anaesthesia and Sedation, University of the Western Cape.
Visiting Professor in Anaesthesiology, University College London, UK
[b] Senior Specialist, Department of Anaesthesia and Critical Care, Groote Schuur Hospital, Cape Town.

References

1. The South African Society of Anaesthesiologists: SASA Sedation Guidelines 2010. Southern African Journal of Anaesthesia and Analgesia 2010:16:S1–S25.
2. Practice guidelines for sedation and analgesia by non-anaesthesiologists. Anesthesiology (2002)961004–17.
3. Implementing and ensuring safe sedation practice for healthcare procedure in adults. http://www.rcoa.ac.uk/docs/safesedationpractice.pdf accessed 5 August 2010.
4. ANZCA: Professional Document PS9 (2005). Guidelines on conscious sedation for diagnostic, interventional medical and surgical procedures. http://www.anzca.edu.au/resources/professional-documents/ps9.html
5. Safe sedation of children undergoing diagnostic and therapeutic procedures. A national clinical guideline. Scottish Intercollegiate Guidelines Network, 2004. http://www.sign.ac.uk/guidelines/fulltext/58/index.html accessed 5 August 2010
6. Cohen LB, DeLegge MH, Alsenberg J, et al. AGA Institute Review of Endoscopic Sedation. Gastroenterology 2007;133:675–701.
7. Ramsay MA, Savege TM, Simpson BR, et al. Controlled sedation with alphaxalone-alphadolone. Br Med J 1974;2:656–659.
8. Némethy M, Paroli L, Williams-Russo P, et al. Assessing Sedation with Regional Anesthesia: Inter-rater Agreement on a Modified Wilson Sedation Scale. Anesth Analg 2002;94:725–728.
9. Lui J, Singh H, White PF. Electroencephalogram bispectral analysis predicts the depth of midazolam-induced sedation. Anesthesiology 1996;84:64–69.
10. Wilson E, David A, Mackenzie N, et al. Sedation during spinal anaesthesia: a comparison of propofol and midazolam. Br J Anaesth 1990;64:48–52.
11. Malviya S, Voepel-Lewis T, Tait AR, et al. Depth of sedation in children undergoing computed tomography: validity and reliability of the University of Michigan Sedation Scale (UMSS). Br J Anaesth 2002;88:241–5.