DR. RICHARD BLENNERHASSETT (Orcid ID : 0000-0001-6359-1950)

Article type : Editorial

Editorial

Procedural sedation: providing the missing definition

S. M. Green,¹ M. G. Irwin,² K. P. Mason,³ on behalf of the International Committee for the Advancement of Procedural Sedation*

1. Consultant, Department of Emergency Medicine, Loma Linda University, Loma Linda, CA, USA
2. Professor, Department of Anaesthesiology, University of Hong Kong, Queen Mary Hospital, Hong Kong
3. Consultant Department of Anesthesia, Harvard Medical School, Boston Children's Hospital, Boston, MA, USA

* Please see Appendix 1 for contributors

Correspondence to: S. M Green

Email: steve@stevegreenmd.com

Twitter: @SteveGreenMD; @mgirwin; @keiramason3

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/ANAE.15213](https://doi.org/10.1111/ANAE.15213)

This article is protected by copyright. All rights reserved

Keywords: procedural sedation; definition; consensus

Surprisingly, there is no generally accepted definition for the practice of procedural sedation. Does it matter? For decades now procedural sedation has been a thriving multidisciplinary field, spanning global practice in a variety of settings, with extensive supporting research, and numerous quality practice guidelines, statements and recommendations. We write on behalf of the *International Committee for the Advancement of Procedural Sedation* (ICAPS, www.proceduralsedation.org), which includes representatives from anaesthesia, emergency medicine, critical care, paediatrics, dentistry, and gastroenterology. In recent publications [1,2] we have cited a definition of procedural sedation from a prominent review article [3]. Thoughtful readers have subsequently alerted us that this definition is not specific enough, as it could also describe general anaesthesia. In agreement with these insightful readers, we searched for a more accurate and precise definition. After a careful review of existing guidelines and documents from prominent societies and organisations, we were surprised to note that the definitions differ substantially, address only partial aspects of relevant goals and practice, and/or do not effectively distinguish procedural sedation from general anaesthesia (Table 1). Indeed, several fail to define it altogether—instead defining only its sub-levels, such as moderate and deep sedation.

Thus, the current reality is that today, despite the worldwide multi-specialty practice of procedural sedation, we still do not have a generally accepted definition for the widespread practice of procedural sedation. Accordingly, when various specialists discuss, research and write about procedural sedation, it cannot be assumed that they are all referring to the same practice. Until we have a common language, various sources will continue to refer to procedural sedation in incomplete and inconsistent ways. Such ambiguity risks compromising patient care, as the specific goals and nature of sedation may be misperceived and misunderstood—particularly by those lacking regular, consistent involvement in sedation practice.

Accordingly, ICAPS endeavoured to create a clear and specific definition suitable for widespread adoption. We employed rigorous sequential Delphi methodology and external review as applied to prior ICAPS projects, [1,2] and as detailed in the Online Supplemental

Material. The task required eleven months of iterative creation and refinement, and we summarise our results as follows.

What makes up the definition?

Beyond the obvious core elements of a procedural sedation definition—i.e., the pharmacological facilitation of a therapeutic or diagnostic procedure, and the intended priority of patient comfort—our discussion then focused on: (1) differentiation from general anaesthesia; (2) best practice references; and (3) issues of patient movement and recall. That we even have the term procedural sedation at all results from the inherent, universal recognition that this task is fundamentally different from general anaesthesia. As such, one might presume little difficulty specifically demarcating the two. Indeed, the American Society of Anesthesiologists (ASA) has long stipulated clear distinguishing criteria [4]. The challenge to such a straightforward resolution is that some discussants blur rather than clarify these distinctions. We have encountered many anaesthetists who describe their personal practice of sedation as frequently or routinely including positive pressure ventilation—an intervention regarded as rescue rather than routine by other specialty physicians. What these anaesthetists are actually performing is generally referred to as monitored anaesthesia care [4], a practice during which an anaesthetist can push beyond sedation including potential conversion to a general anaesthetic. This intended potential to administer general anaesthesia is, by definition, not procedural sedation.

Our consensus was to clarify rather than blur the distinctions. General anaesthesia targets an unarousable state in which airway intervention is often required and spontaneous ventilation is frequently inadequate. [4] Procedural sedation, on the other hand, targets a state during which airway patency, protective airway reflexes, spontaneous respiration and haemodynamic stability are preserved. This is the essence of the difference. Brief airway and ventilatory abnormalities may sometimes inadvertently occur with procedural sedation (and lead to intervention, as appropriate); however, the practice techniques of procedural sedation should ensure that any such irregularities are not often or frequent. Extensive research confirms successful compliance in a variety of settings. If a practitioner deviates from this norm and instead targets a state in which clinically important airway/ventilatory compromise is “often” or “frequent”, [4] then this should not be considered procedural sedation.

Best practice

The second challenge we faced was distinguishing a formal definition from its broader medical context. Procedural sedation co-exists alongside other practice elements within the umbrella of a larger cognitive and policy framework—with general expectations regarding best practice, training, and appropriate safeguards. A formal definition for one focused aspect of medical practice need not re-state or confirm compliance with other overlapping portions or implicit best practice expectations. During editing our committee members volunteered the addition of phrases such as “skilled, trained practitioners”, “close observation and monitoring”, “ensuring safety”, “maximising comfort and satisfaction”, and “an individualised approach”. Such elements are, of course, critical to best practice and are outlined in standard sedation guidelines. A formal definition, however, exists solely to succinctly state the nature, scope, or meaning of what something is—not the totality of its optimal state. The ASA definition of general anaesthesia [4], for example, describes what it is without the implicit corollaries of training, monitoring, and safety. As a non-medical analogy, archery is defined as the sport or skill of shooting with a bow and arrows. Appropriate training and safety precautions are assumed, but not part of its essential definition.

Movement and recall

Finally, some members suggested that the definition of procedural sedation include statements regarding control of patient movement and of the lessening of patient awareness and recall. How much movement control is needed depends on the procedure, and the phrase itself could be misinterpreted as the intent to abolish movement—as is typical during general anaesthesia. Therefore, we chose to omit specific mention of movement, believing it sufficiently addressed by the facilitation of the procedure and the provision of patient comfort. Similarly, while awareness/recall should not occur during general anaesthesia, for procedural sedation it is, by definition, very likely with minimal or moderate sedation and possible with deep sedation. It is also debatable as to whether awareness/recall is undesirable during sedation if the patient is not experiencing any pain or distress. In fact, some patients specifically request to be aware and awake during the sedation. So we also chose to omit this element, believing it sufficiently addressed by the stated intent to alleviate anxiety and pain. We have not included the outdated term “conscious sedation”; although it is still used quite commonly, it is confusing and could be considered an oxymoron [5].

Conclusion

We achieved strong consensus on the definition for the practice of procedural sedation shown in Box 1. We believe that it encompasses the essence of what procedural sedation is and distinguishes it in functionally clear terms from general anaesthesia. The widespread adoption of such a common language would ensure that when we discuss procedural sedation, we are all talking about the same thing.

Acknowledgements

MI is an editor of *Anaesthesia*. No other competing interests declared.

References

1. Green SM, Leroy PL, Roback MG, et al. An international multidisciplinary consensus statement on fasting before procedural sedation in adults and children. *Anaesthesia* 2020; **75**: 374-85.
2. Roback MG, Green SM, Andolfatto G, et al. Tracking and reporting outcomes of procedural sedation (TROOPS): standardized quality improvement and research tools from the International Committee for the Advancement of Procedural Sedation. *British Journal of Anaesthesia* 2018; **120**: 164-72.
3. Krauss B, Green SM. Procedural sedation and analgesia in children. *Lancet* 2006; **367**: 766-80.
4. American Society of Anesthesiologists: Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia. <https://www.asahq.org/standards-and-guidelines/continuum-of-depth-of-sedation-definition-of-general-anesthesia-and-levels-of-sedationanalgesia> (accessed 26/01/2020).
5. Green SM, Krauss BS. Procedural sedation terminology: moving beyond “conscious sedation.” *Annals of Emergency Medicine* 2002; **39**: 433–5.

Appendix

Contributors: International Committee for the Advancement of Procedural Sedation members who created this definition also included A. Absalom, E. Alcaïno, G. Andolfatto, F. Babl, E. Barbi, D. Carlson, L. Rezende Costa, P. S. S. Costa, P. Leroy, M. G. Roback, J. Roelofse and V. Yuen.

Online supporting information

Appendix S1 An overview of the Delphi methodology, and references for Table 1.

Table 1: There is no generally accepted definition for the practice of procedural sedation. This is a list of assorted definitions from a variety of prominent specialty societies and regulatory organisations together with our comments. Formal references for these documents can be found in online Appendix S1.

Society or Organisation	Comment
Academy of Medical Royal Colleges 2013: <i>“Sedation is a drug-induced depression of consciousness, a continuum, culminating in general anaesthesia.”</i> [1]	This broadly defines the sedation continuum, but not the practice of procedural sedation.
American Academy of Pediatrics 1985, 1992, 2002, 2006, 2016 [2-6] American Dental Association 2016 [7] American Society of Anesthesiologists 1996, 2002, 2018 [8-10] The Joint Commission 2002 to present [11] UK NICE guideline 2010 [12] United States Centers for Medicare and Medicaid Services 2011 to present [13]	These entities provide definitions for sedation sub-states (e.g. minimal / moderate / deep sedation), but not for the overall practice of procedural sedation.*
American College of Emergency Physicians 1998, 2005, 2011, 2014, 2019 2019 definition: <i>“the use of anxiolytic, sedative, hypnotic, analgesic, and/or dissociative medication(s) to attenuate anxiety, pain, and/or motion. These agents are administered in order to facilitate amnesia or decreased awareness and/or patient comfort and safety during a diagnostic or therapeutic procedure.”</i> [14]	The 2019 definition is also compatible with general anaesthesia. The older definition is insufficiently patient-centric, as we want patients to be comfortable rather than just ‘tolerate’ the procedure. The phrase

1998, 2005, 2011, 2014 definition: <i>“Procedural sedation and analgesia refers to the technique of administering sedatives or dissociative agents with or without analgesics to induce an altered state of consciousness that allows the patient to tolerate painful or unpleasant procedures while preserving cardiorespiratory function.”</i> [15-18]	<i>“preserving cardiorespiratory function”</i> is ambiguous, and technically might be considered incompatible with subclinical capnographic abnormalities.
American Society of Gastrointestinal Endoscopy 2018: <i>“Sedation is a drug-induced depression in the level of consciousness.”</i> [19]	This definition is also compatible with general anaesthesia.
Association of Anaesthetists (UK): no definition put forth	
Canadian Anesthesiologists Society 2018: <i>“Procedural sedation is defined as the technique of safely administering short-acting sedative or dissociative agents, with or without analgesics, to reduce discomfort, apprehension, and potentially unpleasant memories while minimizing cardiorespiratory depression of patients during diagnostic and therapeutic procedures. These effects are distinct from both general anesthesia, which provides a state of total unconsciousness, and analgesia alone, which delivers a reduction in or insensibility to pain, not necessarily with a reduction in or a loss of consciousness.”</i> [20]	This definition, unlike the others, makes substantial effort to distinguish procedural sedation from general anaesthesia. However, there remains ambiguity about <i>“minimising cardiorespiratory depression”</i> .
European Society of Anaesthesiology 2018: <i>“The term procedural sedation and analgesia involves the use of hypnotic and/or analgesic medications to enable effective performance of diagnostic or therapeutic procedures effectively, whilst the patient is closely monitored for potential adverse effects.”</i> [21]	This definition is also compatible with general anaesthesia.
Quebec Guidelines 2009: <i>“Procedural sedation and analgesia, commonly referred to as “sedation,” is the</i>	This definition is also compatible with

<i>use of anxiolytic, sedative, analgesic, or dissociative drugs to attenuate pain, anxiety, and motion to facilitate the performance of a necessary diagnostic or therapeutic procedure, provide an appropriate degree of amnesia or decreased awareness, and ensure patient safety.” [22]</i>	general anaesthesia.
Royal College of Anaesthetists / Royal College of Emergency Medicine (UK) 2012: <i>“Sedation is a continuum which extends from normal alert consciousness to complete unresponsiveness.” [23]</i>	This defines the sedation continuum but not the practice of procedural sedation.

* The ASA separately states that: *“Sedation and analgesia comprises a continuum of states ranging from minimal sedation (anxiolysis) through general anesthesia” [10].* However, this is a definition of the sedation continuum rather than the practice of procedural sedation.

Box 1: ICAPS definition for the practice of procedural sedation

The practice of procedural sedation is the administration of one or more pharmacological agents to facilitate a diagnostic or therapeutic procedure while targeting a state during which airway patency, spontaneous respiration, protective airway reflexes,¹ and hemodynamic stability are preserved,² while alleviating anxiety and pain.

Notes:

1. For procedures such as bronchoscopy, procedural sedation may occur with concurrent blunting of airway reflexes with local anaesthesia.
2. Sedation states within the purview of the above definition include minimal sedation, moderate sedation, dissociative sedation, and deep sedation. The practice of procedural sedation differs from the practice of general anaesthesia, which targets an unarousable state in which airway intervention is often required and spontaneous ventilation is frequently inadequate; see: <https://www.asahq.org/standards-and-guidelines/continuum-of-depth-of-sedation-definition-of-general-anesthesia-and-levels-of-sedationanalgesia>

Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:

Green, SM;Irwin, MG;Mason, KP;International Committee for the Advancement of Procedural Sedation,

Title:

Procedural sedation: providing the missing definition.

Date:

2021-05

Citation:

Green, S. M., Irwin, M. G., Mason, K. P. & International Committee for the Advancement of Procedural Sedation, (2021). Procedural sedation: providing the missing definition.. Anaesthesia, 76 (5), pp.598-601. <https://doi.org/10.1111/anae.15213>.

Persistent Link:

<http://hdl.handle.net/11343/276045>