

Dr Cliff Shelton
Department of Anaesthesia
Wythenshawe Hospital
Southmoor Road
Manchester
M239LT

The Anaesthesia Case Report (ACRE) checklist: a tool to promote high-quality reporting of cases in peri-operative practice

C. L. Shelton,^{1,2} A. A. Klein,³ C.R. Bailey^{4,5} and K. El-Boghdadly^{4,5}

¹*Consultant, Department of Anaesthesia, Wythenshawe Hospital, Manchester University NHS Foundation Trust, Manchester, UK*

²*Senior Clinical Lecturer in Anaesthesia, Lancaster Medical School, Lancaster University, Lancaster, UK*

³*Consultant, Department of Anaesthesia and Intensive Care, Royal Papworth Hospital, Cambridge, UK*

⁴*Consultant, Department of Anaesthesia, Guy's and St Thomas' NHS Foundation Trust, London, UK*

⁵*Honorary Senior Clinical Lecturer, Kings College London, UK*

Correspondence to: Dr Cliff Shelton (cliff.shelton@nhs.net)

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Email/twitter: CS: cliff.shelton@nhs.net, @drcliffshelton
AK: andrew.klein@nhs.net
CB: craig.bailey@gstt.nhs.uk @drcrbailey
KE: elboghdadly@gmail.com, @elboghdadly

Summary

Case reports have fulfilled an important role in the development of anaesthesia and continue to be highly relevant in modern practice. Despite this, they are sometimes criticised for being insufficiently rigorous to meaningfully inform clinical practice or research design. Reporting checklists are a useful tool to improve rigour in research, and although case report checklists have previously been developed, no existing checklist focuses on the peri-operative setting. In order to address the need for a case reports checklist that better accommodates peri-operative care, we used an established tool as the basis for developing the 12-item Anaesthesia Case Report checklist. This was refined using an iterative approach, through feedback from journal editors with experience of handling case reports, patient and public involvement, and trialling its use in *Anaesthesia Reports* submissions. The Anaesthesia Case Report checklist differs from existing checklists by aligning with peri-operative practice; it places less emphasis on making diagnoses and focuses on the way in which clinical challenges, for example related to the patient's comorbidities or operative interventions, are addressed. Adopting a standardised approach to the content of case reports presents clear benefits to authors, editors and peer reviewers through streamlining the processes involved in writing and publication. The Anaesthesia Case Report checklist provides a pragmatic framework for comprehensive and transparent reporting. We hope that it will facilitate the authorship of high-quality case reports with the potential to further improve the quality and safety of peri-operative care.

Introduction

Case reports have been instrumental in the development of anaesthesia over the last two centuries, often heralding the beginning of what have subsequently become revolutions for our specialty, such as the introduction of diethyl ether and spinal anaesthesia [1, 2]. In the last decade however, many journals have all but stopped publishing them, not least because they are often poorly cited. Nevertheless, there is an ongoing need in modern practice to learn from the clinical experiences of others, an approach that has proved particularly valuable in the current SARS-CoV-2 pandemic [3]. The ongoing appetite for case reports has been demonstrated through an increasing number of submissions to, publications by, and downloads from the Association of Anaesthetists case reports journal *Anaesthesia Reports* [4, 5].

All case reports should convey an educational message which, in the peri-operative setting, typically arises from the authors describing how they addressed a clinical challenge. Other key elements that make case reports suitable for publication include novelty and interest, either in terms of the challenges faced or the solutions developed. For the educational value and clinical impact of a published case report to be maximised, it should be as complete, accurate and transparent as possible, while remaining focused [6]. Based on our experience of editing numerous case report submissions to *Anaesthesia* and *Anaesthesia Reports*, we acknowledge that the requirement for both comprehensive reporting and brevity is a challenge for writers, many of whom are at an early stage in their authorship careers. In this setting in particular, checklists are a useful tool to promote consistency and standardisation [7].

The use of checklists in research reporting is well-established in the biomedical literature. Examples include the Consolidated Standards of Reporting Trials (CONSORT) checklist for randomised controlled trials [8]; the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for observational studies [9]; and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for evidence synthesis [10]. Drawing on the successes of these checklists, and in response to concerns that "case reports often are insufficiently rigorous to be aggregated for data analysis, inform research design, or guide clinical practice", in 2013 a group of experts published the consensus-based Case Report (CARE) guidelines [11]. This project aimed to "help authors reduce bias, increase transparency, and provide early signals of what works, for which patients, and under which circumstances", and included a checklist to provide structure for clinical case reporting [12]. Despite these benefits however, CARE in its original form is not ideal for reporting the majority of peri-operative cases. This is because whilst CARE focuses on diagnoses [13], anaesthetic work is instead characterised by managing the physiological interactions between the patient, the anaesthetic and the surgery [14]. Although diagnostic work can be important in peri-operative practice, it seldom forms its centrepiece [15, 16].

Several adaptations of the CARE checklist have been published to account for different clinical settings [17-19], however, no adaptation has been developed to support the reporting of peri-operative practice. To address this need,

we have developed an adapted version of the CARE guidelines, which we have named the Anaesthesia Case Report (ACRE) checklist.

Methods

In developing the ACRE checklist, we sought to maintain the underlying principles of transparency, consistency and rigour, whilst aligning the checklist with the practicalities of peri-operative practice. Because adaptations of the CARE checklist are permitted through Creative Commons licensing*, we were able to use the CARE checklist as a framework for development. We expanded the guidelines for the description of elements of practice that are of greater importance in the peri-operative context (e.g. interventions), and incorporated others which are not universal under headings that represent how they typically fit within peri-operative work (e.g. 'clinical findings' and 'diagnostic assessment' from the CARE checklist are components of 'assessment, optimisation and consent' in the ACRE checklist). We omitted the requirement for an illustrated timeline, due to the relatively short duration of most anaesthetic cases. We also made minor amendments to the checklist structure, to better align with standard authorship guidelines.

The development of the ACRE checklist comprised four stages. In the first stage, an initial draft was produced as an adaptation of the CARE checklist, which was then refined through a process of discussion amongst the co-authors, all of whom have extensive experience of handling and editing case report submissions. Quantitative scoring was not performed; instead, views and suggestions were noted and implemented iteratively. The next stage involved distributing the resulting checklist to the *Anaesthesia* Editorial Board to seek feedback for integration into the checklist. This involved the 14 editors and one trainee editor reviewing each item, with clarifications provided if required. The third stage then consisted of three months of informally trialling the checklist when editing *Anaesthesia Reports* submissions, with further minor amendments made on the basis of the performance of the checklist in practice. This real-life implementation allowed an assessment of practicality and acceptability to authors and editors to be made. Finally, a draft of the checklist was reviewed by the Patient, Carer and Public Involvement and Engagement group of the National Institute for Academic Anaesthesia to seek feedback from patients and the public. This review resulted in further amendments to the sections on consent, patient perspectives and discussion. The resulting checklist has been used on an optional basis when reviewing, editing and revising *Anaesthesia Reports* submissions without any requirement for further changes.

Results

The full 12-item ACRE checklist is shown in Table 1. Items 1, 2, 3, 4 and 12 are only slightly altered from their equivalents in the CARE checklist, with minor amendments made for style and consistency. Item 5 'focused patient and contextual information' retains the patient information as described in the CARE checklist [12], but adds consideration of the context, for example, the surgical procedure that was planned, as this is important in defining the considerations for peri-operative management. Item 6 'assessment, optimisation and consent' includes the pre-intervention patient assessment (analogous to a combination of the 'clinical findings' and 'diagnostic assessment' sections from the CARE checklist [12]), as well as the addition of a description of the consent process, and an explicit statement of the clinical challenges that were identified. These may, for example, relate to the patient's comorbidities, the proposed surgery, or the environment in which peri-operative care was provided. Strategies for mitigation of these challenges including any pre-operative optimisation should also be described. Item 7 'interventions' is an adaptation of the 'therapeutic interventions' section from the CARE checklist, renamed to acknowledge that anaesthesia is rarely therapeutic *per se*. It should include a detailed description of intra-operative management to allow the reader to understand how the anaesthetic was delivered and any 'non-standard' devices that were used should be identified. Adverse events are more prominent in peri-operative case reports than in those with a diagnostic focus, and therefore 'adverse/critical events' is included as a distinct section (item 8) in the ACRE checklist, rather than as a subsection of 'follow-up and outcomes' in the CARE checklist. Explanation of adverse events should include an explanation of how they were identified and managed, as well as any human factors that either contributed to or mitigated their effects. This allows for the description of positive human factors, facilitating learning from excellence as well as from error [20]. Item 9 'follow-up and outcomes' is modified from the CARE checklist to accommodate the nature of postoperative anaesthetic visits, which tend to be shorter in duration than follow-up reviews in other specialties and seldom involve investigations [12]. Item 10 'discussion' includes suggestions for future changes to practice and/or research, which were not included in the CARE checklist. Finally, item 11 'patient/carer perspective' has been

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expanded to include carer perspectives when appropriate, and a description of any information that may be useful to include in future consent discussions with patients undergoing similar peri-operative care.

Discussion

The ACRE checklist provides a pragmatic framework for the comprehensive and transparent reporting of cases in anaesthesia and peri-operative medicine. Adopting a standardised approach to the content of case reports presents clear benefits to authors, editors and peer reviewers through streamlining of the manuscript authorship, review and editorial processes. Furthermore, there are benefits for readers and the scientific community: although they are rarely perceived as mandatory for publication [21], there is well-established evidence that checklists do improve the quality of reporting of experimental studies [22, 23], and standardised reporting is a logical precursor to high-quality evidence synthesis. Although there is not yet evidence that the development of CARE has improved the quality of case reports, it has begun to acquire the status of a 'standard' against which they can be measured [24, 25]. We hope that the ACRE checklist represents a move towards achieving an equivalent standard for reports concerning peri-operative practice.

We recommend that authors of prospective case reports make use of the ACRE checklist at an early stage, potentially during or shortly after being involved in an interesting case, to assist them in determining what information they should collect prior to writing it up. It should then be used to assist in structuring the report, and finally as a checklist during proof-reading prior to submission for publication [26]. The ACRE checklist will from now on be used by the editors and reviewers of *Anaesthesia Reports* and *Anaesthesia* and is specified in our author guidelines. Furthermore, we would encourage its use in structuring case presentations, for example during morbidity and mortality meetings, and its adoption by other anaesthesia journals. To encourage this broader utilisation of the ACRE checklist, we intend to disseminate it through our social media channels, discuss it at forthcoming national and international meetings and make it freely available through the *Anaesthesia Reports* and *Anaesthesia* websites, as well as registering it on the enhancing the quality and transparency of health research (EQUATOR) network database [27]. We will collect data on the content of the submissions that we receive in order to begin to assess the effect that the ACRE checklist has on the quality of submitted case reports and will make use of this to further refine the checklist if necessary. We intend to report the findings of this process in due course.

The limitations of the ACRE checklist are related to those of the CARE guidelines from which it is derived, and which were identified by its authors [11,13]. These include the opinion-based method of guideline development and the difficulties in using case reports to make causal associations. Though we contend that the ACRE checklist represents a better fit for peri-operative practice than the CARE checklist, it is unlikely to be able to perfectly accommodate every kind of case, procedure and event that falls within peri-operative professional remits. The CARE checklist may therefore remain more appropriate in cases that are diagnostically driven, such as those that focus on the critical care setting. Also, because we have aligned the ACRE checklist with our author guidelines it may require further modification for use by other journals and we would encourage this as appropriate.

The establishment and ongoing success of *Anaesthesia Reports* demonstrates the importance of case reports to learning in anaesthesia, peri-operative medicine, critical care and pain management. Through adapting the CARE guidelines to produce the ACRE checklist, we believe that we have now provided a reporting standard for cases in peri-operative practice, which was not accounted for by previous guidance. We hope that this checklist will facilitate the authorship of high-quality case reports that have the potential to influence practice and research, to further improve the quality and safety of peri-operative care.

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Table 1. The 12-item Anaesthesia Case Report (ACRE) checklist.

Item Name	Item No.	Brief Description	Check
The Narrative: A case report tells a story in a narrative format that includes the clinical context/challenges, assessment, pre-operative optimisation, anaesthetic interventions, critical incidents, outcomes and follow-up. The narrative should include a discussion of the rationale for any conclusions and any take-away messages.			
Title	1	Focused in terms of context, clinical challenges and intervention.	<input type="checkbox"/>
Keywords	2	Two to five key words that identify topics in this case report.	<input type="checkbox"/>
Summary	3	a) Why the case report is relevant to readers. b) Case report: - The procedure or situation for which peri-operative management was required. - The principal clinical challenges. - The strategies that were adopted to account for these challenges. c) Conclusion - what the primary (and secondary) novel or educational message is.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Introduction	4	a) A brief background to the clinical condition or problem presented. b) Summarise why this case is unique and/or educational with medical literature references.	<input type="checkbox"/> <input type="checkbox"/>
Focused patient and contextual information	5	a) De-identified patient information. b) The procedure or situation for which peri-operative management was required. c) The main concerns of the patient. d) Medical, family and psychosocial history. e) Previous anaesthetics/interventions and their outcomes. f) Physical examination and other clinical findings.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Assessment, optimisation and consent	6	a) Assessment methods (e.g. laboratory/physiological testing, imaging, risk stratification). b) Principal clinical challenges identified, e.g. comorbidities, incidents/events, clinical situation. c) Optimisation interventions (e.g. pharmacological, physical, physiological). d) Planned management (aims of management and strategies to address challenges). e) Explanation of the consent process.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Interventions (specify device and manufacturer for all non-standard equipment)	7	a) Monitoring. b) Induction of anaesthesia/performance of regional anaesthesia, including: - Pharmacology: drugs; doses; administration (include description of imaging/nerve localisation for regional anaesthesia); endpoints. - Airway management if applicable. c) Maintenance of anaesthesia/intra-operative management, including: - Assessment of depth of anaesthesia/neuromuscular blockade function. - Summary of physiological/physical observations. - Summary of any interventions. d) Emergence, including the early post-operative status of the patient.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Adverse/critical events (if applicable)	8	a) Description of what was observed/detected and at what time/juncture. b) Interventions to manage the event (e.g. pharmacological, airway, surgical, etc). c) The success of interventions (including how this was assessed). d) Human factors contributing to and/or mitigating the event (i.e. both negative and positive human factors).	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Follow-up and outcomes	9	a) Clinician- and patient-assessed outcomes, when appropriate. b) Intervention success and tolerability (how was this assessed?)	<input type="checkbox"/> <input type="checkbox"/>
Discussion	10	a) Strengths and limitations in your approach to this case. b) Discussion of the relevant medical literature. c) The rationale for your conclusions. d) The primary (and secondary) novel or educational message. e) Suggested changes to future practice and/or research.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Patient/carer perspective	11	Patients and/or carers should share their perspectives or experience whenever possible, including, when appropriate, information that would be useful in explanation to others undergoing similar peri-operative care.	<input type="checkbox"/>
Acknowledgements	12	a) Statement as follows: "This case report was published with the written consent of the patient" (or next of kin, if applicable). b) Declaration of any external funding and/or competing interests.	<input type="checkbox"/> <input type="checkbox"/>