Investigation of trainee and specialist reactions to the mini-Clinical Evaluation Exercise in anaesthesia: implications for implementation

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Background. The mini-Clinical Evaluation Exercise (mini-CEX) is a workplace-based assessment which may be useful in anaesthesia training. However, its value depends on how supervisors use it with their trainees. This study analyses experience with the mini-CEX after its introduction into anaesthesia departments in our institution.

Methods. We conducted surveys, focus groups, and interviews with trainees and specialists. Data were recorded, transcribed, and entered into NVivo 8. Themes were identified and data coded into these themes.

Results. We identified six themes: assessor factors included skills needed to perform the assessments, influences on scoring decisions, and effects on the specialist–trainee relationship; trainee factors related to impact on trainee performance and value at the different training levels; teaching and learning included the effect of focused observation on structuring workplace learning; feedback described how the mini-CEX changed feedback and what was considered useful; mini-CEX process included implementation, initiation of assessments and case selection; and use in assessment included comparisons with existing assessments and the ability to identify poor performers.

Conclusions. Mini-CEX formalized the supervisory relationship, promoting educational interactions. During the observation period, trainees took responsibility for decisions, and specialists learnt more about their abilities. The structured format broadened the scope of feedback and made it easier to address performance gaps. We identified factors that facilitated or hindered implementation, or limited effective feedback and the ability to address poor performance. From this analysis, we propose strategies for the implementation of mini-CEX, and recommendations for assessor training to improve the quality and value of the assessments.

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The move to performance-based assessment in post-graduate medical education has prompted the introduction of various workplace-based measurements which aim to provide evidence on trainee ability and, importantly, to enhance the quality of workplace training. However, achieving this relies on workplace supervisors’ ability and willingness to accurately assess trainees and give honest and constructive feedback.

The mini-Clinical Evaluation Exercise (mini-CEX)¹ is a widely used instrument for workplace-based assessment, demonstrated in several studies to improve feedback to trainees and enhance workplace learning.³⁻⁴ A supervisor
watches a trainee with a patient for ~15 min, then rates the trainee in different competencies and provides written feedback.

As part of a programme of research commissioned by the Australian and New Zealand College of Anaesthetists to evaluate a range of workplace-based assessment tools, we set out to evaluate the mini-CEX for both summative and formative assessment in anaesthesia training. Assessments were voluntary and participants informed that results were known only to the research team, and as such had no impact on any formal assessment process. We introduced a modified, online version of the mini-CEX (Fig. 1) into the five anaesthetic departments in our institution. Descriptors were provided for each category and performance level (view rating form at http://www.minicex.ac.nz/bja). Assessor training consisted of written and online information and journal articles, a series of department presentations, one-on-one training in theatre on request, and two voluntary workshops.

We have previously reported on the analysis of more than 300 mini-CEX assessments, which showed around 15 assessments with a defined group of assessors could produce sufficiently precise scores to decide on satisfactory trainee performance with 95% confidence. Participant feedback strongly supported the value of the mini-CEX on feedback. However, assessor variability and leniency and varying assessor confidence in using mini-CEX suggested that trainee feedback was not always accurate or optimally effective.

Several studies have reported limited faculty skills in provision of feedback to medical students and residents after mini-CEX assessments. Others have raised concerns that clinical assessments do not accurately reflect student performance and report faculty reluctance to fail students. To our knowledge, this is the first study to investigate these issues in the context of anaesthesia.

In this study, we aimed to explore the attitudes of trainees and specialists towards the mini-CEX and develop recommendations for assessor training and implementation of mini-CEX in anaesthesia.

**Methods**

After Ethics Committee approval, and 1 yr experience with mini-CEX at our institution, we surveyed trainees and specialists, and conducted focus groups with trainees and interviews with specialists. The survey contained both ratings and open questions requesting written responses. We used focus groups with trainees because the group setting can make potentially vulnerable participants more confident in sharing information. Focus groups and interviews were semi-structured and conducted by two non-anaesthetic members of the research team (A.J. and D.S.) to minimize bias due to interviewer/participant interaction.

**Sampling**

All specialists and trainees who had submitted one or more mini-CEX assessments were included. Trainees were invited to attend one of two focus groups scheduled during a regular trainee meeting, generating a convenience sample based on roster allocation. A stratified random

<table>
<thead>
<tr>
<th>Patient assessment and preparation</th>
<th>Unsatisfactory 1</th>
<th>Satisfactory 4</th>
<th>Superior 7</th>
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<td>Communication skills with staff</td>
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<td>Overall clinical care</td>
<td>0 0 0 0 0 0 0 0 0</td>
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**Fig 1** Mini-CEX assessment form. *u/c*, unable to comment.
sample of specialists ensured representation across different anaesthetic departments in the institution, and across specialists with varying numbers of submitted assessments. Specialist interviews continued until saturation (i.e. no new data were being generated).11

Analysis
Interviews and focus groups were recorded and transcribed and, with survey responses, were entered into NVivo 8 qualitative software package (QSR International Pty Ltd). Two researchers (D.S. and A.J.) analysed the data using the constant comparison technique.11 They read all the transcripts and, having immersed themselves in the data, generated initial themes. These themes were refined by constant comparison of the themes with the data during the coding process, until the researchers agreed the themes expressed the meaning in the data and the data could be coded within these themes.

Results
We received written survey responses from 69 participants (29 of 35 trainees, 40 of 48 specialists) which was an 83% response rate from each group. We conducted 12 specialist interviews, and 11 trainees attended one of two focus groups.

The themes arising from the data fell into six main themes: assessor factors, trainee factors, teaching and learning, feedback, the process of mini-CEX, and its use for assessment. Results reported here are the opinions of participants, and words in quotation marks are direct quotes from Trainees (T) or Specialists (S).

Assessor factors
This theme focuses on assessor skills using the mini-CEX, influences on their scoring, and how the assessment affected their supervisory relationship with the trainee.

Specialist training in mini-CEX varied. Some lacked confidence in their ability to use the form or give feedback, whereas others, even those with no or limited training, considered the mini-CEX form self-explanatory, with no particular need for training. ‘I think you can actually do this without any training. I mean it’s fairly user friendly filling all the gaps and then press submit’ (S).

However, trainees felt that in order to generate accurate scores, assessor training was required, comparable with examiner training for College Fellowship examinations. They felt assessor scoring needed calibration, if consistent scores were to be obtained. They noted some specialists rated the mini-CEX items ‘good, good, good, good,’ (T) without justifying their score or discussing their feedback with the trainee. Trainees noted a cursory approach by some specialists to items such as professionalism. Although descriptors were provided for each category, these were not necessarily referred to and interpretation varied. ‘A lot of the assessors don’t bother reading that [the descriptors], they just give a gut grade’ (T).

Defining the standard of performance was problematic for trainees and specialists. In some instances, referring to the descriptors on the form could have helped. ‘People marking it have really been unsure as to what the different numbers mean’ (T). Some specialists were unsure if they should be hard or lenient, and wanted more guidance on judging the level of performance. Trainees felt scores could depend on ‘whether the specialist doesn’t want to offend you, or whether they’re an “everybody gets an 8 or 9” or whether everybody starts at the middle and they go either way’ (T).

There was potential for personal interactions leading to scoring bias. ‘We all know those that sort of take a shine to somebody and dislike other people’ (S). Trainees felt that specialists’ hobbyhorses and enthusiasms could lead to low scores if trainees did not know their preferences.

Because specialists scored differently, trainees felt that they could not measure progress. ‘If you have a different assessor each time they might not have the same standard’ (T).

Although specialists may have recognized unsatisfactory performance, they were not necessarily prepared to record it. When faced with unsatisfactory performance, ‘I would obviously correct them and point it out, but I would be a little bit more loathe to actually put it down on paper as such’ (S). A number of reasons for this were proposed. Some specialists felt they would not be able to justify an unsatisfactory score, some felt they may award an unsatisfactory score for one category as long as all categories were not unsatisfactory, while the extra work required in failing a trainee put off some specialists. ‘I just give them all sort of 4s, . . . not. . . you know . . . the 3s or 1s which they really are. And then it becomes someone else’s problem’ (S). ‘[It] starts having legal implications for the registrar and that kind of thing, so I would have a bit of a problem [failing them]’. The face-to-face nature of the encounter encouraged leniency and above average scores. ‘It would be very hard for me to say not acceptable on the thing [mini-CEX form], even though I might correct them’ (S). ‘It’s probably partly my personality and partly the response I get from the registrars. . . . if you give them a satisfactory. I mean they’re mostly doing it satisfactorily but they prefer to get above satisfactory’ (S).

Trainee factors
This theme focuses on the value of the mini-CEX according to level of training, the impact on trainee performance, and on the relationship with the supervisor.

Specialists generally found the mini-CEX worked better with junior trainees, because it was easier to identify things that could be improved in conducting the anaesthetic or their technical skills, and the junior trainees were more enthusiastic about seeking the assessments.
Participants suggested this could be because junior trainees were used to such assessments or felt they had more to learn about anaesthesia, whereas senior trainees could generally manage a routine case without difficulty. The goals of the assessment needed to change with seniority, with more focus on management and professional issues, which were perceived as more difficult to assess with a single brief period of observation. However, senior trainees noted the mini-CEX could be useful for identifying ‘bad habits’ they had developed in patient management.

Some trainees altered their behaviour because they were being assessed. ‘You start being a bit more defensive about what you do’, (T) or ‘You do it the way they [Specialists] would do it to make them happy’ (T). Anxiety about being assessed impaired performance in some trainees. ‘If you leave him to it he’s actually fine’ but ‘when he’s under scrutiny he starts mucking things up’ (S). If the assessments were ‘for real’ rather than just a trial, performance anxiety may have been worse.

By introducing assessment into the specialist/trainee interaction, the mini-CEX had the potential to affect the collegial relationship between trainee and specialist. ‘It changed the relationship, maybe made almost like a barrier between the registrar and the consultant’ (S).

### Teaching and learning

This theme reports on the observation of practice, and structuring teaching and learning in theatre.

The mini-CEX meant that specialists took more notice of what trainees were doing. ‘It’s astounding that you can come to the end of an eight month run and the specialist says well we don’t really know you’. After working 50 or 60 h a week, ‘someone’s surely, you know, managed to make some observations. So in that respect I think it’s [the mini-CEX] quite good’ (T). For more senior trainees in particular, who tended to be left on their own, the mini-CEX encouraged increased observation by their supervising specialists. ‘If it means they actually hang around and do a formal sort of, a bit of education, a bit of feedback … you know it’ll be better’ (T).

The mini-CEX provided specialists with a structure to guide their observations. ‘It did formalise my thinking about them a little bit more’ (S). Specialists looked in more detail at the different categories of performance. ‘You’re actually looking at communication; you’re listening to what they say and what they’re not saying’ (S).

The mini-CEX also encouraged specialists to let the registrar take responsibility. ‘It sort of forced the specialists to stand back and watch you, whereas often what happens when you’re with a specialist is that you end up sort of sharing management of the case and so you never feel like a specialist actually sees you managing a case on your own’ (T).

The process encouraged both specialists and trainees to think about teaching and learning during the list and this ‘improved the training quality’ (S). Using the mini-CEX made trainees ‘focus on something that you want to have assessed, or want to get feedback on’ (T). It provided a ‘point of focus on the list’ and for the specialists, an ‘impetus to teach’ (S).

‘I’ve found it useful as an aid to make you pick a topic, an area to focus on during the anesthetic, talk about it and give feedback. So I think it actually promoted learning and discussion’ (S).

### Feedback

This theme addresses the environment for feedback and how the mini-CEX changed this, the value of feedback relative to expected standard, and how the mini-CEX affected the quality and quantity of feedback.

Trainees felt there was not a strong culture of feedback. ‘One thing that’s totally lacking in medical training across the board is feedback, and knowing where you are in relation to your colleagues and also what your specialist actually really [thinks]’ (T). The anaesthesia training environment could provide good opportunities for teaching and feedback as trainees and specialists often worked together, but these opportunities were underutilized. Senior trainees in particular felt they missed out on feedback. ‘When you’re doubled up with a specialist for a list it usually means that you don’t see the specialist very much and you get very little on the job teaching’ (T). The mini-CEX facilitated feedback. ‘I think there’s no argument, no question in my mind that it’s a far superior tool to anything that we’ve had in place prior to this in terms of giving you very specific feedback about how you’re doing … you don’t generally get a lot of feedback about how you’re performing in theatre other than a very non-specific sort of, that you know, that’s fine or whatever’ (T).

Trainees appreciated being assessed against the expected standard for their level of training, and liked to know how they compared with their peers. ‘You have no idea how competent you are compared to the others’. ‘Performance relative to your peers is very important … it gives you something to sort of work at … that’s actually quite a powerful motivator’ (T).

Trainees were keen to know what their supervisors thought and appreciated the timeliness of the feedback. In general, trainees had no idea ‘whether they [their supervisors] think you’re fine or if there’s any problems. You find out literally at the end. At least with this [mini-CEX] if there’s any problems … you’re actually getting feedback and you’re actually finding out [if] you’re performing to the expected level’ (T).

Specialists found giving feedback easier with mini-CEX. The feedback was expected and formalized, and the rating form directed specialists to a wider range of behaviours. ‘Often with feedback you may tend to give more … feedback on one particular aspect of something that they’ve done without then going through all the other
things … You tend to focus on one thing and often of course that can be a negative thing. This actually forces you to look at the positive things more as well’ (S).

This structured guide for feedback made it easier to give corrective feedback and identify what could be done better. ‘It gave you a format to give feedback, and you might have just let things, not mentioned things or especially negative feedback I think. It gave a constructive way of maybe talking about stuff that you might have just let ride otherwise’ (S). Forcing specialists ‘to think about what you could actually improve on was probably the most useful portion of your feedback’ (T).

For trainees who moved between hospitals, there was a sense that the specialists ‘don’t know you, they don’t know how much you don’t know, and it makes it difficult for them to target their teaching’ (T). As specialists interacted with trainees giving feedback with the mini-CEX, they learnt more about the trainees’ knowledge and decision-making and ‘yes… definitely get to know more about what they’re thinking’ (S).

Mini-CEX process

Factors affecting acceptance and implementation of the mini-CEX, ease of use, and case selection are included in this theme.

Participants felt acceptance would increase, if the mini-CEX was there from the beginning of the training programme, with an expectation of routinely completing one on every elective list with a specialist. As the mini-CEX was not a routine procedure, remembering to do it was a major barrier, often only remembered after prompts. ‘I think I’d probably like to do one every elective list’ (T). Trainees felt 10–20 assessments would give a good overview of progression through a speciality area and large numbers would ensure a cross-section of assessors and cases and would provide helpful information to supervisors-of-training at their formal mid-rotation and end of rotation interviews with trainees.

The online form was easy to use, and convenient to complete on the anaesthetic work station computer. It was generally not regarded as an extra workload if the assessment could be completed in theatre, but this was not possible with a rapid turnover of short cases. The mini-CEX worked best if discussed and planned before the operating list, but the ‘fluidity’ of the daily roster made this difficult.

Clarity of trainee and specialist roles during an assessment was important, where these roles were often not explicit. Some trainees found it difficult when their supervising specialist stood back and observed, and were unsure if they could ask for help.

Use of the mini-CEX for assessment

This theme reports on concerns about how the assessment would be used, comparison with existing in-training assessments, and the ability of the mini-CEX to pick up poor performers.

The need for workplace-based assessments was generally acknowledged. ‘I do think it’s quite amazing that you can get through your training and glaring holes haven’t been picked up’ (T). Registrars felt the current in-training assessment process was ‘based on someone’s recollection at the end of four months of the interactions they’ve had with you a couple of months ago where they can’t remember anything specific anymore’ (T). The mini-CEX was seen as an improvement, but with some limitations. In particular, the written comments were context-dependent, and could be misinterpreted by external assessors.

Specialists were reluctant to score trainees poorly. Some were not confident that they knew enough about a trainee after a brief period of observation to give a failing score and would have preferred longer. Some were not prepared to give a low score or commit anything to writing even if they felt it was warranted, partly because of the face-to-face nature of the assessment and partly due to the legal implications. ‘We’ve had a couple of problem trainees—[but] whenever any particular specialist was asked, can you please make a comment about this, they always back down’ (S). It was unclear if the mini-CEX would be more likely to formally identify these problem trainees.

Discussion

Mini-CEX formalizes the supervisory interaction between anaesthetic specialists and trainees, and promotes teaching interactions. As specialists are asked to stand back and observe their trainees, trainees have to take responsibility for the case, and specialists learn more about their trainees’ skills and decision-making processes. The structured nature of the rating form means that specialists give feedback across a broader range of topics and are more inclined to address issues that may otherwise not be mentioned. However, the assessment can be threatening to trainees and may alter how they perform, and may also alter the nature of the collegial relationship between the specialist and the trainee by emphasizing the assessor role of the specialists. Although the mini-CEX increases the quality and quantity of feedback, the reluctance of assessors to award failing grades could potentially limit its ability to identify underperforming trainees.

Good feedback on performance is vital for work-based learning, but supervisors tend to give feedback infrequently. The mini-CEX facilitates feedback, and can lead to improved trainee performance. However, a closer look at the written feedback, and exploration of trainees’ reactions to this feedback, suggests room for improvement.
Reactions to mini-CEX

Table 1 Recommendations for implementing workplace-based assessments

Recommendation and Rationale

**Implementation strategy**
- Assessments should be frequent enough to become routine. Assessments are less threatening and less likely to affect performance if part of the daily routine.
- Assessment should be scheduled. Initiating voluntary assessments is effortful and easily forgotten.
- Use a structured rating form with descriptors. This helps specialists to give both positive and corrective feedback.
- The ‘rules’ for conducting the assessments should be explicit. Unclear instructions may cause trainee anxiety and variations in rating process.
- Consider using on-line rather than paper assessments. On-line assessments are easy to use and facilitate completion.

**Recommendations for Components in Assessor Training**
- Knowledge and skills in interactive feedback are a key training need. Many clinicians lack confidence and skills in engaging in feedback.
- Identify and discuss the different roles of the clinical supervisor in workplace learning. Workplace assessments can alter the trainee/specialist interaction, emphasising the supervisory and teaching roles. Explicit discussion may encourage clinicians to more willingly adopt these different roles.
- Maximize the value of focused observation and increased understanding of trainee abilities by discussing theories and approaches to learner-centred teaching. Workplace assessments help specialists understand what trainees know, can do, and how they make decisions. This means any teaching intervention can be better tailored to the needs of the trainee.
- Discuss rating decisions and what the trainee would need to do to score more highly. Trainees benefit more from discussion of scoring decisions than from the award of a number. Trainees want to know how they can improve their performance.
- Explore attitudes on ‘willingness to fail’ and provide information on the consequences of failing a trainee. Specialists are unwilling to fail trainees, limiting the value of the assessment. This may be addressed by improved knowledge of the consequences of failing a single assessment, discussion on norms of behaviour regarding failing, and increased confidence in ability to judge performance.

**Rating instrument**
- Use a scale which rates against expected level of performance for the trainee. Trainees want to know how they compare to their peers and what the norm is at that level.
- Include trainees from all levels of experience but consider different rating criteria for more advanced trainees. Senior trainees are as keen for feedback as their junior colleagues, but the most relevant competencies may not be observed in a brief encounter with a single patient.

Unwillingness to fail trainees has been reported. Dudek and colleagues\(^9\) proposed four barriers to reporting medical students who performed poorly: (i) lack of documentation; (ii) lack of knowledge of what to specifically document; (iii) anticipating an appeal process; and (iv) apparent lack of a remediation process. Cleland and colleagues\(^8\) proposed that unwillingness to fail medical students had three primary determinants: (i) the attitude towards reporting, for example, the belief that reporting would lead to unfavourable outcomes for students or assessors; (ii) perceived norms of reporting, for example, did colleagues also report the underperformer; and (iii) assessors’ confidence in their own ability to reliably make a judgement on students’ performance. Our own findings suggest that these barriers and attitudes persist into specialist training.

Drawing on our findings, we propose a set of guidelines for implementation of mini-CEX, which may also apply to other workplace-based assessment tools in anaesthesia. Engaging supervisors in mini-CEX assessments provides a stimulus for discussion of broader educational issues, which could usefully be included in assessor training (Table 1).

Our study was limited to a single institution and our findings may not be repeated in other institutions. However, the findings of researchers exploring these work-based assessments in other clinical disciplines are similar, which suggests that there may be some general lessons.

On balance, our data support the implementation of workplace assessments such as mini-CEX to improve the learning environment for anaesthesia trainees. Our study goes some way to understanding why anaesthesia trainees and specialists find the mini-CEX useful, how it could be improved, and the barriers to using it more effectively. On the basis of our findings, we propose a number of strategies for implementation of mini-CEX assessments. Furthermore, we identify potential content for assessor training, both to optimize the quality and educational value of the assessments, and to maximize the opportunity to improve the educational knowledge and skills of supervisors.

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