

Faculty staff perceptions of feedback to residents after direct observation of clinical skills

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CONTEXT Performance-based workplace assessments are increasingly important in clinical training. Given the inaccuracy of self-assessment, the provision of external feedback to residents about their clinical skills is necessary for the development of expertise. However, little is known about the processes used by faculty members in giving feedback to residents after observing them with patients. This study explores the factors that underpin faculty members' decisions regarding the feedback they give to residents after directly observing them with patients and the factors that influence how feedback is delivered.

METHODS In 2009, 44 general internal medicine faculty staff responsible for out-patient resident teaching from 16 internal medicine residency programmes watched four videotaped scenarios and two live scenarios of standardised residents (SRs) with standardised patients and rated the SRs using the mini-clinical evaluation exercise (mini-CEX) format. Faculty staff also provided feedback to the SRs after the live encounters. After each encounter, faculty staff were individually interviewed using a semi-structured interview. Interviews were

videotaped, transcribed and analysed using grounded theory methods.

RESULTS Two broad themes were identified in faculty members' descriptions of the feedback process: variability in feedback techniques, and the factors that influence how faculty staff think and feel about delivering feedback. Multiple approaches to feedback delivery were observed. Faculty members' tensions in balancing positive and negative feedback, their own perceived self-efficacy, their perceptions of the resident's insight, receptivity, skill and potential, the faculty member–resident relationship and contextual factors impacted the feedback process.

CONCLUSIONS The provision of feedback by faculty staff to residents after observing resident–patient interactions is a complex and dynamic process and is influenced by many factors. Understanding these cognitive and affective factors may provide insight into potential new approaches to faculty development to improve faculty staff's feedback skills and the effectiveness of their feedback.

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 INTRODUCTION

Performance-based assessments in the workplace are increasingly emphasised in clinical training programmes to evaluate residents (i.e. house officers, registrars) and provide them with feedback on their clinical skills.^{1–3} Feedback, defined as ‘specific information about the comparison between a trainee’s observed performance and a standard, given with the intent to improve the trainee’s performance’,⁴ is essential in clinical education.⁵ Given the inadequacy of self-assessment,⁶ objective, external feedback is essential to inform residents about what they are doing well and what requires improvement.⁵ The ultimate goal of feedback is to facilitate improvement.⁷ Through deliberate practice, which requires external feedback, expertise can be achieved.⁸ The effectiveness of feedback is influenced by characteristics of the feedback source (faculty staff, attending doctors), the feedback recipient (resident) and the feedback message,^{9,10} and feedback can improve, impede or have no effect on performance.^{11,12} These findings suggest that the relationship between feedback and performance is not as straightforward as it may appear. However, the moderators that influence the effect of feedback on performance remain poorly understood. Recommended techniques for delivering effective feedback have been described,^{5,9,13,14} as have methods by which it is often given.^{14,15} Faculty development workshops designed to enhance feedback skills are pervasive.¹⁶ However, trainees remain dissatisfied with the quantity and quality of feedback they receive,^{17–21} and faculty staff remain uncomfortable about giving it and insufficiently prepared to do so.^{14,22}

Despite the shift to outcomes-based training, increasing requirements for the direct observation of trainees with patients and ample research about how faculty staff rate trainees after direct observation,²³ little is known about the cognitive and affective processes engaged by faculty staff who deliver feedback after these assessments.^{2,10} For example, what are the faculty member’s goals in giving feedback after observation? How do faculty staff decide what feedback to provide? How do they approach giving it? What factors make providing feedback easy or challenging? Understanding faculty members’ cognitive processes in relation to the provision of feedback after direct observation may shed light on how the attitudes and skills of faculty staff consciously or unconsciously influence their behaviours (i.e. how they give feedback). A better understanding of how faculty staff think and feel

about providing feedback after observing resident–patient interactions may also help elucidate why faculty staff are uncomfortable providing feedback²⁴ and why trainees are dissatisfied with it.

Therefore, the objective of the present study was to explore the factors that underpin faculty staff decisions regarding the giving of feedback to residents after observing them in clinical encounters with patients. This paper extends our previous report on the factors that influence faculty staff ratings of and judgements about trainees in clinical interactions with patients.^{25,26} This current paper provides a deeper and more nuanced analysis of the cognitive affective goals and decisions of faculty staff when providing feedback to residents and the factors that influence how that feedback is delivered.

 METHODS

Sample

We e-mailed programme directors at seven university-based and nine community-based, university-affiliated internal medicine residency programmes in the Philadelphia region asking them to identify general internal medicine out-patient faculty resident preceptors (i.e. attending doctors) who might be potentially interested in participating in a study about resident assessment. We subsequently e-mailed and invited 114 faculty members. Recruitment stopped after the first 48 faculty staff replied based on an *a priori* power calculation for the quantitative component of this study.²⁵ Of the 48 faculty members who agreed to participate, 44 (92%) completed the study. Table 1 describes their characteristics based on responses to a demographic questionnaire they were asked to complete in advance of the study day. A total of 46% of study participants had previously participated in faculty development (i.e. workshops) in the assessment of residents in a clinical setting and 52% had participated in workshops on giving feedback. When asked to rate their level of comfort with their skills in giving feedback on a 5-point scale (1 = very uncomfortable, 5 = very comfortable), the majority of faculty staff were found to be comfortable or very comfortable when providing a resident with positive feedback, negative feedback or an action plan (91%, 64% and 64%, respectively).

Study design and data collection

Faculty members participated on one of nine study days (three to six faculty staff per day) between March

Table 1 Demographics of participating general internal medicine out-patient faculty resident preceptors ($n = 44$)

Characteristics	
Age, years, mean (SD)	44.2 (8.7)
Male, n (%)	25 (57)
Rank, n (%)*	
Instructor	4 (9)
Assistant professor	19 (43)
Associate professor	15 (34)
Professor	4 (9)
Affiliation, n (%)	
Community-based	20 (46)
University-based	24 (54)
Out-patient precepting experience, years, mean (SD)	12.4 (7.5)
Non-precepting out-patient clinical effort, %, mean (SD)	46.2 (25)
Prior participation in workshop on assessment of residents in a clinical setting, n (%)	20 (46)
Prior participation in workshop on giving feedback, n (%)	23 (52)
Use of mini-CEX in the past year to assess residents, n (%)	39 (89)
* Two participants (5%) did not report rank SD = standard deviation; mini-CEX = mini-clinical evaluation exercise	

and August 2009. On the study day, each faculty member individually watched four videos and two live cases of a standardised resident (SR) taking a history, performing a physical examination or counselling a standardised patient (SP).²⁵ Each case was scripted to depict a postgraduate year 2 (PGY2) resident with unsatisfactory, satisfactory or superior performance of history taking, examination, counselling and interpersonal skills. In the USA, postgraduate (after medical school) internal medicine training lasts 3 years. Case error scripting (by JRK) used actual resident performance norms and scripts were reviewed by the study team to confirm that they reflected predetermined performance levels. For the video cases, four volunteer medical trainees were trained on a single scenario and were videotaped once their performance accurately represented the intended performance level. For the live cases, residents were given scripts to guide their performance, self-assessment and receptiveness to feedback.

Table 2 Examples of interview questions asked of precepting internal medicine faculty staff

Interview questions for video and live encounters focused on feedback
1 What did you observe in this encounter? (a) What did you think the resident did well? (b) What, if anything, were areas in need of improvement?
2 What feedback would/did you give this resident? (a) What would be/was your goal in giving feedback? (b) Why would/did you prioritise that feedback? (c) What do you like about how you gave the feedback? (live encounters only)
3 Would your rating or feedback change if: (a) this was the first time you were working with this resident? (b) this was a resident you would not be working with again versus working with regularly? (c) this was a resident of whom you had high versus low expectations?
4 How would/did you feel giving this feedback and why?
5 How do you think the resident felt when receiving feedback and why? (live encounters only)
6 What do you notice about yourself as you give feedback? (live encounters only)
7 What might you have done differently? (live encounters only)

The four videos were shown in random order. After watching each of the video encounters, faculty members listed the SR's strengths and weaknesses and then completed a mini-clinical evaluation exercise (mini-CEX). The mini-CEX, developed by the American Board of Internal Medicine to provide residents with feedback about their history taking, physical examination, counselling, judgement, humanism, organisation and efficiency, and overall performance, uses a 9-point scale (unsatisfactory: 1–3; satisfactory: 4–6; superior: 7–9).^{27,28} Faculty staff were then interviewed individually by a trained study investigator in a 15-minute, semi-structured interview. This sequence was repeated with other video encounters. Table 2 presents examples of interview questions. Each faculty member was interviewed by at least three interviewers over their various interviews. Interviewers were chosen based on their experience in interviewing. All were trained during a half-day meeting to interpret and deliver the interview guide in the same manner in order to elicit information of a consistent type.

Following the video scenarios, faculty staff observed two SR–SP live encounters. After each encounter, the SR and SP left the room whilst the faculty staff immediately rated the SR using the mini-CEX. Following this completion of the mini-CEX evaluation the SR returned and the evaluator provided him or her with up to 10 minutes of feedback (unlike the video encounters, in which no feedback was given to the SR). This feedback was video-recorded. The faculty member was then interviewed individually by a study investigator in a 30-minute, semi-structured interview (Table 2) and was asked about the feedback encounter both before and after watching the recording of themselves giving feedback to the SR. Both the study investigator and the faculty member were permitted to pause the recording at any time to ask questions or make observations. The purpose of the live encounters was to shift the exchange from a more theoretical discussion of feedback (based on the videotaped encounters) to one based on the actual experience of observing a resident in real time and providing feedback. All interviews with faculty staff were video-recorded and transcribed verbatim. Identifying information about the participants was removed and all transcripts were reviewed for accuracy. The University of Pennsylvania School of Medicine Institutional Review Board approved the study and all participants provided written informed consent.

Data analysis

Once all data had been collected, we utilised grounded theory methods to analyse the data for emergent themes and to develop a thematic coding structure.²⁹ We chose this method to avoid restricting ourselves to current hypotheses or inferences about feedback from prior studies.³⁰ In traditional grounded theory, early interview data are analysed to inform and refine subsequent interviews.²⁹ Study logistics (i.e. SP, SR, faculty member, interviewer and facility availability) did not permit us to formally code data between interviews; however, grounded theory methods can be viewed as a set of principles and practices, not as prescriptions or packages, and guidelines can be flexible.³¹ Adjustments to the interview protocol were made according to early experience and information participants had provided (i.e. redundant questions were eliminated; questions were reworded to improve flow and clarity; additional probes were included).

Transcripts of both the faculty staff interviews with study investigators and the feedback given by faculty members to SRs were sampled for coding across

faculty participants, SP cases and interviewers. Two researchers (JRK and LNC) independently coded and used constant comparative techniques to develop a preliminary coding structure.²⁹ A portion of the transcripts were also coded by other study team members (ECB, ESH, KEH, SJD) to review, further define and refine the coding structure. Refinement of the coding structure continued as analysis progressed. Coding was terminated when theoretical saturation was achieved and when all team members agreed upon final interpretation of the data. In total, 34% ($n = 60$) of all video interviews, 50% ($n = 44$) of live interviews and 23% ($n = 20$) of the actual feedback encounters with the SRs were coded. These feedback transcripts had not been previously coded. NVivo Version 8.0 (QSR International Pty Ltd, Melbourne, Vic, Australia) was used to organise and analyse the data.

RESULTS

We organised our results around two broad themes that emerged in faculty members' descriptions of the feedback process: (i) variability in feedback techniques, and (ii) factors that further influence how faculty staff think or feel about delivering feedback.

Variability in feedback techniques

Directive versus elaborative feedback

We identified two styles used by faculty staff to provide feedback: directive and elaborative.³² In feedback encounters characterised by a directive approach, the faculty member relayed his or her observations and judgements about the clinical encounter to the resident. The goal was the delivery of information, which created the feel of a 'laundry list' of observations.⁴ When using this approach, the faculty member did not ask the resident questions during the giving of feedback. Thus, inferences the faculty member might have made during observation²⁶ could not be explored and either verified or discredited:

'I would start off with my objective observations. I'd say look, I could see that you really weren't comfortable with this, I could tell by your body language, I could tell by the way you're standing with your arms folded and you didn't sit down. So I could tell you were uncomfortable and you really could have done a better job. So let's talk about how we could have done a better job.' (Faculty member D3, video case 2)

Conversely, in elaborative feedback encounters, the faculty member helped the resident assess and reflect upon the encounter and his or her skills. These encounters were characterised by dialogue between the faculty member and resident, and questioning by the faculty member. There was reaction and interaction. Faculty staff used several questioning strategies. Most faculty members began the feedback by asking the resident to self-assess, asking questions to establish which aspects of the encounter the resident considered had gone well, which had not gone well, what he or she might do differently the next time and how he or she felt about the encounter. Faculty staff who asked trainees to self-assess described how the elaborative approach made it easier to provide negative feedback. This approach served as an icebreaker, encouraged resident reflection, allowed the resident to potentially identify his or her weaknesses first (thereby making it easier for the faculty member to give feedback), and made the giving of feedback feel less pejorative or damaging:

‘I’m trying to get him to do some reflection so I don’t have to do it for him. And I think that’s what’s hard for us. We don’t want to be the first people to tell them what didn’t go well. We would like it to somehow be in their brain first so that it’s a collaborative effort as opposed to: “I saw that you didn’t do this, even though you didn’t see it, and I’m the faculty here, so I’m right, you know, what you think was a good job wasn’t.”’ (Faculty member C6, live case 2)

Although many faculty members asked residents to self-assess before providing feedback, only a few questioned residents throughout the feedback encounter. In these encounters, the faculty member asked the resident to describe how he or she had felt during the encounter, to share what he or she had been thinking during aspects of the history or physical examination, or to elaborate on his or her clinical reasoning. Some faculty staff used questions during the feedback to guide additional resident reflection and to help the resident to identify additional strengths and weaknesses. Unlike staff using the more directive feedback approach, faculty staff using this interactive and elaborative approach described how it enabled them to clarify potential inferences they might have made during observation and assessment:

‘My use of questions. I think it’s critically important because just like I am with patients, I need to check

in. I know what’s in my mind but I have no clue what’s on the learner’s mind so I use questions to find out (1) where they’re at, what’s important to them. And, (2) is to make sure that I understand that they’re understanding what I’m saying.’ (Faculty member I1, video case 2)

Importantly, faculty members who questioned residents throughout the feedback process were able to learn about the resident’s knowledge, skills and attitudes in greater depth than that afforded by the information they had ascertained from their observation of the clinical encounter alone:

‘I wanted to confirm my assumption. I wanted to make sure that she had considered everything in the differential because a headache can be either catastrophic or it can be a migraine. So I wanted to make sure she had considered everything and I couldn’t get that from the observation.’ (Faculty member A3, live case 2)

However, although faculty staff knew they should solicit the resident’s self-assessment, many were less clear or consistent in how or if they used that self-assessment. Often the feedback that faculty members provided was unrelated to the content of the resident’s self-assessment. Additionally, many faculty staff were quick to provide their own observations and judgements rather than probing with additional questions when the resident offered a vague self-assessment. Similarly, faculty staff often failed to explore or help the resident in an area the resident found difficult.

Focus

Variability in what different faculty members chose as the focus of feedback was also apparent. Some faculty members described using a faculty-centred approach in which they primarily focused on an area in which they had expertise or in which they liked to give feedback (i.e. physical examination, interpersonal or counselling skills). Some faculty staff described focusing feedback on skills specific to the observed encounter, whereas others described trying to focus their feedback on skills generalisable to other encounters. Some faculty members prioritised feedback about resident skills that can only be assessed by direct observation or areas on which they felt residents infrequently received feedback. Typically, these foci were selected independently of resident performance:

'They get feedback more often on physical exam techniques; they don't get feedback on counselling techniques. So I would prefer to use my time in that.' (Faculty member C4, live case 2)

Less frequently, faculty staff described using a learner-centred approach in which they targeted the feedback to an area identified by the resident. Some of the faculty members who used such an approach believed it increased residents' receptivity to feedback:

'The teacher will appear when the learner is ready... If I just say well, let me tell you what you did wrong... I think the learner will be less likely to change than if they want to know gee, how do you think I handled that? ... He's much more likely to be receptive and open to hearing that answer than if I just say let me tell you what I think your strengths and your weaknesses were. So, if he identifies an opportunity where he wants to be sensitive to change, he's more likely to change.' (Faculty member I1, video case 2)

Some faculty members simply shared all of their observations and did not seem to focus or prioritise their feedback.

Order

Faculty staff variably ordered the content of their feedback. Some faculty members organised their feedback to mirror the chronology of the encounter, whereas others organised it according to the order of the competencies on the mini-CEX form. The feedback sandwich (giving positive, negative and then positive feedback) was one of the frameworks to order feedback most commonly referred to. In many cases, faculty staff felt this approach enabled them to highlight what had been done well, to maintain trainee esteem and to provide feedback in a way that reduced trainee tension:

'I was giving out positive stuff first, unless they're totally horrendous, but even then, you usually commend them that their coat's clean or something. Something to make them comfortable.' (Faculty member M1, video case 4)

However, some faculty staff identified limitations to the feedback sandwich, particularly in terms of its predictability:

'So you start out with good, you get to the negative, then you end it up with a little bit of review and hopefully

some good again. It's a nice introduction, and it sets them up. After you've given it a few times, they're like, "Yeah, just give me the bad stuff. I know what you're doing here."' (Faculty member C4, live case 2)

Rarely was the order of feedback determined by a topic the resident self-identified or by areas in which the resident scored lowest:

'Counselling skills, I gave her a 4. Low on the satisfactory, but again, this is part of the most valuable number here. This is what the whole feedback session might – in my opinion ought to – be centred upon.' (Faculty member H1, live case 1)

Factors influencing feedback

Our data uncovered a number of modifiers or factors that further influenced faculty members' perceived ability to give feedback effectively and comfortably rather than with a sense of challenge and discomfort. We grouped these factors into faculty-level factors, those related to faculty perceptions about the resident, and the importance of relationships and contextual factors.

Faculty-level factors

Tension among goals

Faculty members' approaches to feedback were influenced by their goals for giving it. For most, the primary goal of giving feedback was to improve the resident's skills (reinforcing the positive, describing areas requiring improvement). This goal was frequently juxtaposed by the faculty member's perceived need to emphasise the positive aspects of the encounter (to encourage the resident to continue to develop good skills) and his or her need to be deliberately gentle and praise-giving concomitantly with being negative or critical. For many, this generated a tension around balancing the positive with the negative or critical aspects of feedback:

'I was concerned if I was going to overwhelm him with too much negative feedback than positive feedback. And I think that I was trying to give a good balance and that sometimes is a little bit anxiety-provoking, to make sure that you're always giving positive and negative.' (Faculty member I2, live case 1)

In some cases, this tension led to an overemphasis on positive feedback, which can ultimately send mixed messages to the resident:

'I give all this feedback that is hard to hear and then after that's over I keep talking trying to make them [the resident] feel better and maybe say some things unintentionally... They will remember the last thing you say, or they will remember the best thing you say, not 95% of other stuff you say.' (Faculty member A3, video case 4)

The desire to be positive in giving feedback seemed to serve the goal of maintaining the resident's self-esteem and forging an alliance with the resident. Faculty members described normalising resident behaviours, incorporating humour in feedback, being casual, and engaging the resident in a non-threatening way:

'I was trying to be two people allied together thinking about a problem together. Like when a patient has a medical problem you want them to see you as their ally in the fight against the problem... So I was trying to say "we" a lot. I noticed I said "in my book" rather than "this is the answer".' (Faculty member L1, live case 1)

Faculty staff also described emphasising positive feedback to maximise resident confidence, receptivity and trust:

'If somebody feels like they are getting feedback that is negative that they don't believe or aren't receptive to, then I think in general they tend to write those people off and not listen to them. I have been doing this for many years now. I found in general if somebody does not trust you or doesn't like you, they are not going to listen to you anyway. So, you might try and get in the least threatening and most constructive way you can without hurting their feelings and making it a personal attack.' (Faculty member J1, video case 2)

Faculty members used a number of strategies (consciously or unconsciously) to emphasise the positive and soften the negative feedback. Approaches included the use of minimising phrases (e.g. 'It would have been nice to add this and nice to add that' [faculty member D5, live case 1]; 'We're talking about some fine tuning' [faculty member G3, live case 1]; '...polishing those skills' [faculty member K1, live case 1]). Faculty members also framed negative feedback positively and shared their own mistakes in an effort to normalise behaviour. They often used very strong positive adjectives when speaking to a resident, despite giving mediocre mini-CEX ratings for the encounter. For example, at the end of feedback describing significant deficiencies,

faculty members would often end with the comment: 'Terrific job.' The physical environment was also highlighted as a factor in minimising the impact of negative feedback:

'Part of making feedback effective is the set-up of the environment. It's important that he's [the resident] between me and the door so it's a less threatening posture. It's important to get up and greet [residents] when they walk in the door, shake their hand, all that kind of stuff. I'm going to try and configure the space so that it's as least threatening as possible.' (Faculty member G3, live case 1)

Although the majority of faculty staff approached feedback with the goal of emphasising the positive, several faculty members described a sense of duty to be constructive and their comfort in delivering more negative, or critical, feedback:

'You know these aren't little kids, let's be honest; these are adults. Probably more often than not, they are past the age of 30, and you're there to mentor them and help them, but they're not babies. The purpose of this is to help somebody and to improve them. Yes, you want to give them encouragement, but if they do everything right and everything is 100% perfect, they don't need training.' (Faculty member B3, video case 1)

Self-efficacy

Faculty members described their desire to provide effective feedback and recognised the importance of doing it well. However, our data suggest that faculty members' self-confidence in their clinical and feedback skills impacted on the level of difficulty they perceived in giving feedback. Examples of areas of low self-efficacy and uncertainty regarding approaches to the giving of feedback after direct observation are detailed in Table 3. Faculty members described difficulty in providing feedback when they were uncomfortable or lacked confidence in the skills they were assessing. For some faculty staff, feedback about the more non-cognitive competency domains (i.e. interpersonal communication, humanism, empathy) was particularly challenging compared with feedback about history taking, physical examination or fund of knowledge. Faculty staff described the subjectivity of these domains and the challenge of providing feedback in them because of the perceived difficulties in remediating these skills. For some faculty staff, their lack of confidence stemmed from a perceived inability to help the trainee. Faculty members also described having

Table 3 Areas of low self-efficacy and uncertainty about providing feedback after direct observation of trainees identified by faculty staff

Area	Example
<i>Low self-efficacy</i>	
Faculty member's own competence in the skill being assessed	'Attendings [physicians] don't feel comfortable with counselling and don't know how to teach it. And it feeds upon itself, because we don't teach counselling, then they [trainees] don't feel comfortable when they're attendings, so then they don't give feedback. It perpetuates the same issue' (Faculty member C4, live case 2)
Feedback about non-cognitive competency domains	'It's hard when you're almost feeling it's a personality thing that you don't like and that you're critiquing a personal flaw. Something that's harder to fix. When you're just talking about how to listen to the lungs it's an easier line of questioning than to point out that you weren't empathetic enough or you didn't seem interested' (Faculty member C3, video case 3) 'I feel uncomfortable giving feedback to people that may be about a professionalism issue. But in a medical knowledge deficiency, it's not so difficult because you identify the problem and you deal with it' (Faculty member F1, live case 2)
Diagnosing the learner's problem and offering an action plan	'I'm not comfortable giving the feedback when I don't know what to say to the resident about how to fix what's wrong' (Faculty member B1, video case 1)
<i>Uncertainty about feedback approach</i>	
How should positive feedback be balanced with negative feedback?	'I am not entirely sure I conveyed that important piece that well... I tried to make one point... and I sort of made that point at the very beginning, I made it again in the middle; at the end, I felt like to mention it again would just be piling on. So, I didn't mention it again at the end, and I would walk away thinking – I hope she got that. I hope she understood how she can do a better job next time. So there is this balance between sort of piling on and making someone feel bad about it versus not being as clear and direct in the feedback' (Faculty member A1, live case 2)
Should notes be used when providing feedback?	'And I try to do that without looking much at the paper... I try not to because I think, as best as you can if it's important you should already know it especially if you're giving feedback [that is] timely and stuff... But I take a lot of notes because this may go in the record... I just think that it's better to just do it as a discussion than looking at it' (Faculty member I2, live case 1)
How much feedback should be given?	'I think probably maybe picking a few things to focus on and just spending that time doing it. I never know whether that's the better way to do it or being exhaustive and saying, "You were this, this, this, and this." At some point, you may not be getting through, it's too many items' (Faculty member C6, live case 2)
How serious should one be in giving feedback?	'I don't like the idea of failing somebody. Perhaps I'm a little too lenient in some of those judgements... Well, I'm kind but I hope not excessively kind. I don't think I like to come across as being mean, but I hope I don't come across as giving exceptionally easy grades either' (Faculty member B4, live case 1) Faculty member: 'I tried to smile less than the first time...' Interviewer: 'Why do you think you need to smile less?' Faculty member: 'I don't know... I feel like people feel like I'm serious about it and I don't want to ever be perceived as less serious about it' (Faculty member I2, live case 1)
Should one give, or not give, the mini-clinical evaluation (mini-CEX) score? If so, when?	'I think it would've been harder for me to sort of face-to-face tell him that he was really just a 5... I probably would've said, I don't know if I would've said, "Here, I rated you a 5." I probably would've just given him the paper and said, "What do you think?" or "Let's talk about this." Or maybe I should say, "I gave you a satisfactory rating and these are the reasons why I gave you a satisfactory rating." Maybe I should do it at the beginning. You know, sort of say, "Look, I gave you this out of 10 because..." and then if I justify it with my positives and negatives, as opposed to doing my positives and negatives and justifying it at the end' (Faculty member A2, live case 1)
What is the best order in which to give feedback?	'So, it's much easier to do it by chronological order, but I don't know if the most important points get lost that way, and if there's a better way to do it' (Faculty member G1, live case 2)

minimal training and a lack of understanding of the best practices for delivering feedback:

‘Is there a standard on how to give feedback? It would be nice to know if there was something standard that said that what you’re doing is the right way to do it.’ (Faculty member G1, live case 2)

Many faculty members described the giving of feedback as a process of trial and error and referred to never knowing the effectiveness of what they were doing. Others described how experience influenced their approach to and feelings about feedback:

‘In the early phase of my career... if someone did not do a great job, I said, “Okay that didn’t go over well, these are all the things that are wrong.” I also didn’t do as much trying to get the resident to engage in their own assessment process. Before, it was more like a child thing: “Don’t do that.” And now I take more of an approach where you identify the areas that need to be improved upon and then make suggestions for what the resident needs to do to improve.’ (Faculty member G2, video case 1)

Emotions

Faculty members’ emotional responses to the observation seemed to impact the delivery of feedback:

‘I have to wait to give him feedback because I’d have to get my own emotions under check before I could give intelligent, constructive feedback... I think that I would be angry and disappointed and I am not sure that that is a constructive way to give information. I don’t think that will come across in a way that they will be able to take anything from and improve because it will be taken as an assault because it has all this emotional stuff attached to it.’ (Faculty member J1, video case 2)

Faculty members also described their *own* emotional responses to providing constructive feedback:

‘It’s horrible to give people somewhat negative feedback, even with the kindest intentions... it takes a lot of courage.’ (Faculty member I3, video case 1)

Many described feeling ‘mean’ or ‘unkind’ when giving negative feedback and feeling good when able to tell a trainee that he or she did a good job. Participants expressed the difficulty inherent in conveying negative information, even comparing the delivery of feedback with the delivery of a cancer diagnosis to a patient.

Perceived resident factors

Faculty staff perceptions of and inferences about residents’ skills, insight, receptivity and potential for improvement influenced their approaches towards and feelings about feedback.

Skill

Not surprisingly, most faculty staff felt that giving feedback about a poor resident–patient encounter was challenging. This was especially true when the encounter featured repeated deficiencies. As described above, many faculty staff liked to provide a balanced feedback message and poor performance limited their ability to include a positive message. For a few faculty members, deficiencies in residents’ skills actually made it easier to give feedback because faculty staff felt responsible for addressing egregious behaviours. Notably, for some faculty members, giving feedback about good performance could also be difficult:

‘I find it hard to give feedback to somebody who is really good because sometimes it is so hard to find the one thing that they do really well. It’s almost the combination of everything and sometimes there are not words for it. Like the expert clinician can’t necessarily explain to you what their thought process is getting to a diagnosis because they are just so used to just putting it all together. It’s really hard to break it down so I actually have trouble giving people really good feedback.’ (Faculty member J1, video case 4)

Insight

Faculty members were most comfortable giving feedback when residents:

‘...understand what they did wrong, and accept and want to improve it versus the resident who thinks they did everything right.’ (Faculty member G3, live case 1)

Faculty members’ perceptions of residents’ insights into their own strengths and weaknesses and ability to self-assess were linked to faculty perceptions of residents’ overall ability to improve:

‘I want to see how much insight they have into their own performance. It gives me a gauge as to how well I think they’re going to improve. If they have just no insight, then it makes me a little worried that they’re not going to improve as much.’ (Faculty member C4, live case 1)

Receptivity

Similarly, faculty members felt it was easier to give feedback when the resident was perceived to be receptive to feedback, which they often defined according to the resident's agreement with the faculty member's assessment of his or her performance:

'I always want to help the person become a better doctor so as long as they're on the same page as I am – then it works great.' (Faculty member I2, video case 4)

Potential

When faculty staff believed residents had the ability or potential to change, feedback was easier to give:

'Some are things that they [trainees] can't change. If you have that resident who is never going to establish a rapport with the patient – it's very hard to give that kind of feedback.' (Faculty member M1, video case 1)

Relationships and contextual factors

For many faculty staff, the faculty member–resident relationship was one of the most important factors that impacted their approach to feedback. As faculty staff described feedback experiences based on direct observation outside the context of this study, they identified multiple ways in which the presence or absence of a longitudinal relationship with the resident influenced feedback. In general, faculty staff found it easier to give feedback to residents they knew because the existence of a prior relationship fostered rapport and trust:

'So first, I've got to make sure I know this guy, have some sort of relationship so then that makes the relationship one of mutuality where you can start giving feedback.' (Faculty member L2, video case 2)

Faculty staff described how a longitudinal relationship fostered resident trust and promoted resident receptivity:

'If they don't know me, they don't know if I'm a good clinician, they don't know if they can trust me. And if they don't agree with it, they're not going to do it. If they know me and they trust my opinion, then I think they're much more likely, even if they disagree with it, to listen to me and pay attention to what I say.' (Faculty member C4, live case 2)

Faculty members also described how knowing residents well enabled them to feel more comfortable and be more direct in their feedback, which, in turn, allowed them to tailor their feedback in a way that would facilitate resident receptivity:

'If it's a PGY3 that I precept in the clinic all the time, that I know really well, I tend to be more frank because I know them really well. A new PGY1 that I'm just meeting, I would never say, "Wow, I can't believe you did that." I'd be much more careful and say, "Well, you did this, how do you think it went?" versus a resident that I know better than that. It's a much more personal relationship. If I know they are capable of better because I know what kind of resident they are I can say to them, "I can't believe you did that, that was terrible," versus somebody who I don't really know very well, I would be much more careful in the way I choose words.' (Faculty member F1, video case 4)

Faculty members also needed to have access to contextual information by which to gauge the resident's current performance. Baseline knowledge of a resident's skills helped faculty staff to decide if a particular encounter represented the resident's actual skills rather than an exceptional performance (such as that delivered on a 'bad day'). Providing feedback in isolation, without this context, was particularly challenging:

'It's harder to give feedback to someone you don't know, because you have one point in time that you're observing them and you don't know them as a whole person.' (Faculty member M1, video case 1)

Some faculty staff described having less investment in feedback when they did not have a relationship with the resident:

'It is always hard to give feedback to someone that you're never going to see again because you're not invested in them. I'd probably just tell her she's doing a good job and I think my feedback would be different... I'd just be more gentle about it, not as regimented, because I wouldn't be as invested.' (Faculty member D1, video case 1)

According to the themes described here, we identified that feedback emerges from the fluid interplay among variable approaches to feedback and the factors (faculty staff, the faculty member's perceptions of the trainee, relationships) that further influence the feedback message.

DISCUSSION

Complexity of the feedback process

Our findings suggest that delivering feedback is a complex process influenced by many factors, including the faculty member's approach to feedback, his or her goals in giving it, skill, perceived self-efficacy and emotions, and perceptions of the resident's skill, receptivity and insight. Increasing this complexity are the interactions among these factors, particularly among the fluid goals and resident–faculty member relationship, that seem to influence feedback dynamically and variably. These findings support the notion that feedback is the result of complex interactions among participants.^{9,33} These complex interactions are consistent with key tenets of situated cognition and ecological psychology theories. The theory of situated cognition suggests that a person's thoughts and actions are tied to, and cannot be separated from, the specific situation within which those thoughts and actions occur.^{33–35} In order to fully understand the concept of feedback, situated cognition would suggest that the contributions of the faculty member, the resident and the social setting all must be considered and that these specific interactions cannot be predicted at the outset of the encounter. Combinations of different faculty member, resident and social setting (e.g. emergency department or out-patient clinic) factors may uniquely impact feelings about and approaches to feedback. Although we did not specifically study the social setting, we found evidence to support the existence of dynamic interactions between participants. Ecological psychology further argues that decision making is not a product of only internal cognitions or responses to environmental influences, but of individuals interacting with one another in an information-rich environment.³⁶ To ignore these interactions undermines the complexity of the feedback process. Ecological psychology proposes that the balancing of goals (which may be fluid or changing) is the main factor driving decisions^{34,36} and our study findings support this notion. For example, situated cognition and ecological psychology would predict very different feelings about and approaches to feedback in an anxious, first-year, on-call resident interacting for the first time with a busy ward team faculty member in a busy emergency department than in a confident, third-year resident interacting with a faculty member who knows the resident well during a longitudinal ambulatory rotation. Not only would the participants in these two scenarios differ in their goals, but the complex interactions between the

participants, as well as the unique social setting of each of the scenarios, would be expected to impact on feelings about and approaches to feedback.

Challenges and considerations for faculty development

Balancing goals seemed to influence faculty members' feelings about and approaches to feedback. Faculty staff stated that the goal of feedback was to improve residents' skills. Yet many struggled to balance this goal with their own psychosocial needs (e.g. to not feel or be perceived as mean), the perceived psychosocial needs of the resident (e.g. to maintain self-esteem) and preservation of the faculty member–resident relationship. The tension and competition between the goals of maintaining both professional standards and the trainee's self-esteem have been described previously.⁹ Clinical supervisors often feel their roles as mentor-coach and assessor conflict, and faculty staff have described the challenges involved in providing residents with negative feedback while maintaining a supportive resident–supervisor relationship.¹ A possible consequence of this tension may be a tendency, via multiple techniques, to minimise negative feedback. Furthermore, the subtleties needed to balance conflicting goals may explain the disconnect between teachers' beliefs that they give feedback but that learners are unable to recognise it, and learners' beliefs that they do not receive feedback at all.⁹ Both situated cognition theory and ecological psychology would predict the existence of multiple goals and tensions in the feedback encounter and would acknowledge the potential for complexity in resolving these tensions.

How might these tensions be addressed? Feedback needs to be refocused as an assessment *for* learning rather than an assessment *of* learning.^{4,37} Reminding faculty staff about the role of feedback in deliberate practice and the development of expertise may help.⁸ Reinforcing the connections between residents' clinical expertise and patient satisfaction, quality of care and safety might further facilitate this mental shift. Finally, faculty staff often lack frameworks and objective milestones when they engage in feedback.²⁶ In the absence of frameworks and shared milestones, feedback may feel more value-laden than objective. Faculty members' confidence, comfort and accuracy in their judgements and feedback may be improved if feedback is framed within the context of agreed milestones. This may improve the effectiveness of feedback by relocating it from a context of feedback

about a person to one of feedback about a task and process.¹³

It was notable that study participants, many of whom were experienced medical educators, struggled with *how* to give feedback. This supports prior work that established that faculty staff use many types of feedback interchangeably, but without a conscious knowledge of their appropriateness.⁹ Faculty members were often faculty-centred and directive in their feedback. Many described the influence of experience on their feedback and referred to having learned to give feedback by a process of trial and error. Some faculty staff figured out more learner-centred, interactive approaches, although sometimes not until late in their careers. Faculty staff frequently used the feedback sandwich, a technique originally felt to be effective because negative information is sandwiched between positive items.³⁸ However, some faculty participants in our study recognised the limitations of sandwiched feedback. The feedback sandwich may be a less effective technique because its primary purpose is to shield the learner and teacher by balancing positive and negative feedback and thereby achieving personal preservation.⁹ Feedback has highly variable effects on performance.¹¹ Therefore, recommended approaches to feedback should be evidence-based (i.e. they should lead to improved performance). Interestingly, many faculty members drew parallels between the giving of feedback and doctor–patient communication. Using doctor–patient communication techniques to create a supportive climate during feedback and adapting motivational interviewing and behavioural change techniques to address the readiness of a resident for change (receptivity to feedback) have been described^{39,40} and may represent a useful model for faculty staff. Perhaps using such doctor–patient communication techniques during feedback could shift the delivery of feedback to a more learner-centred (rather than faculty-centred) conversation and reduce emotion while providing residents with objective information.⁴⁰ This is an area worthy of additional study. Faculty members identified additional areas of low self-efficacy about feedback given after observing resident–patient interactions (i.e. how general or specific feedback should be, whether to provide the mini-CEX score, how much feedback to provide, how to provide feedback and an action plan in non-cognitive domains). They also described situations in which feedback felt complex or emotionally charged (i.e. in contexts with a ‘problem learner’). In our study, such situations were described as involving feedback recipients with unsatisfactory skills, perceived poor insight and lack of receptive-

ness to feedback. This is similar to equivalent situations described in the context of in-training evaluation.²⁴ Given that even experienced faculty staff rarely respond to behaviours identified as significantly problematic in the clinical setting,⁴¹ faculty development should specifically address the provision of effective, evidence-based strategies for providing feedback in these difficult situations. Because faculty staff and resident contextual factors interface dynamically, faculty members are likely to need a cadre of techniques and approaches for delivering feedback that can be tailored to different situations. For example, given that perceptions of the value of feedback depend, in part, on the extent to which feedback can be reconciled to the recipient’s self-assessment,⁴² faculty staff need to learn techniques for delivering feedback in situations in which accurate self-assessment is lacking.

Feedback is not given or received in a vacuum.⁴³ Learners interpret feedback through filters influenced by the feedback provider, self-assessment of their abilities, motivations and expectations.^{44,45} Our findings describe the impact of these perceived reactions on the emotions and approaches to feedback of faculty members. Feedback is more effective when the source is perceived to be credible. This implies that the resident must perceive the faculty member to be sufficiently knowledgeable to be able to make an accurate judgement about the resident’s performance and must trust the faculty member’s motives and intentions.¹⁰ Feedback effectiveness is maximised when there is a sequential process that includes repeated instances of feedback rather than a series of unrelated events.^{9,10} This highlights the importance of longer-term professional relationships.²⁴ Taking measures to ensure that faculty members regularly work with one or more residents (e.g. on a medical home team) may lead to improvements in the provision of feedback through the presence of a faculty member–resident relationship and its perceived influence on faculty credibility and subsequent resident receptivity. However, current residency training trends are characterised by increasing discontinuity, shorter attending blocks and increased shift work.^{46,47} Given the realities of the current training environment, we need to identify models that enable faculty staff to give feedback after brief observations in settings in which maintaining an ongoing relationship with a trainee may not be possible. Additional attention to the role of the resident in the feedback process is also needed.¹⁷ A great deal of work still needs to be done to understand how and why giving feedback has become such a potentially dangerous activity. Medical training

culture promotes a pressure to excel and to be perfect from early in its process and, even among practising doctors, the cultural norms traditional in medicine do not promote reflection but, rather, stoicism and reluctance to reveal errors and shortcomings. Is medical training alone in its heightened sensitivity to negative feedback?

Limitations

There are several limitations to this study. Study participants were general internists who described and gave feedback to SRs after SP encounters. Therefore, the findings reported here may not be generalisable to other specialties, other learner levels or other contexts in which observations are made. We do not know whether the findings would have differed if the faculty staff had interacted with their own residents in actual patient encounters or in different settings (e.g. in clinic or in the emergency department). Faculty staff were observed as they gave feedback. We do not know whether our observations were impacted by a Hawthorne effect whereby faculty members' actual feedback practices may differ from the practices they used under observation. Faculty staff's perceptions of their own low self-efficacy in giving feedback may have been primed by their status as study participants. The study day protocol required faculty staff to watch videotaped encounters of SRs with SPs and subsequently to describe all of their observations. This may have caused faculty staff to share all of their observations with residents during feedback rather than to prioritise certain observations. Effective feedback implies that there will be re-observation;⁴ however, this was not built into our study design. As we did not explicitly address the impact of the social setting in this investigation, we cannot comment on its role in the giving of feedback. Although effective feedback is trainee-centred,^{9,40} this study explored feedback from the faculty perspective only. Further exploration of the learner's reactions to feedback techniques and approaches and the factors that influence these reactions is needed to ensure that the learner's place in the interaction is not devalued.

CONCLUSIONS

To our knowledge, this study is the first to explore faculty staff cognition and emotion about the process of delivering feedback after observing trainees with patients, and complements the expanding literature about the complex, dynamic and highly variable

nature of feedback.^{9,12,24,39} Many potential areas for faculty development have been identified. Like other skills, developing expertise in giving feedback requires deliberate practice with regular feedback, continuous reflection on strategies and emotions evoked during the process, and consideration of the influence of different learners in different contexts.⁸ Additional research is needed to determine the faculty development methods that are most effective in promoting the acquisition of these skills and expertise.

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REFERENCES

- 1 Govaerts MJB, van der Vleuten CPM, Schuwirth LWT, Muijtjens AM. Broadening perspectives on clinical performance assessment: rethinking the nature of in-training assessment. *Adv Health Sci Educ* 2007;**12** (2):239–60.
- 2 Govaerts MJB, Schuwirth LWT, van der Vleuten CPM, Muijtjens AMM. Workplace-based assessment: effects of rater expertise. *Adv Health Sci Educ* 2011; **16** (2):151–65.
- 3 van der Vleuten CPM, Schuwirth LWT. Assessing professional competence: from methods to programmes. *Med Educ* 2005;**39** (3):309–17.

- 4 van der Ridder JMM, Stokking KM, McGaghie WC, ten Cate OT. What is feedback in clinical education? *Med Educ* 2008;**42** (2):189–97.
- 5 Ende J. Feedback in clinical medical education. *JAMA* 1983;**250** (6):777–81.
- 6 Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *JAMA* 2006;**296** (9):1094–102.
- 7 Sargeant J, Armson H, Chesluk B, Dornan T, Eva K, Holmboe E, Lockyer J, Loney E, Mann K, van der Vleuten C. Processes and dimensions of informed self-assessment: a conceptual model. *Acad Med* 2010;**85** (7):1212–20.
- 8 Ericsson KA. Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains. *Acad Med* 2004;**10** (Suppl):70–81.
- 9 Archer JC. State of the science in health professional education: effective feedback. *Med Educ* 2010;**44** (1):101–8.
- 10 Brinko KT. The practice of giving feedback to improve teaching. What is effective? *J Higher Educ* 1993;**64** (5):574–93.
- 11 Kluger AN, DeNisi A. The effects of feedback intervention on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychol Bull* 1996;**119**:254–84.
- 12 Cianci AM, Klein HJ, Seijts GH. The effect of negative feedback on tension and subsequent performance: the main and interactive effects of goal content and conscientiousness. *J Appl Psychol* 2010;**95** (4):618–30.
- 13 Hattie J, Timperley H. The power of feedback. *Rev Educ Res* 2007;**77** (1):81–112.
- 14 Hewson MG, Little ML. Giving feedback in medical education: verification of recommended techniques. *J Gen Intern Med* 1998;**13** (2):111–6.
- 15 Holmboe ES, Yepes M, Williams F, Huot SJ. Feedback and the mini-clinical evaluation exercise. *J Gen Intern Med* 2004;**2**:558–61.
- 16 Skeff KM, Stratos GA, Bergen MR, Albright CL, Berman J, Farquhar J, Sox HC Jr. The Stanford Faculty Development Program: a dissemination approach to faculty development for medical teachers. *Teach Learn Med* 1992;**4** (3):180–7.
- 17 Bing-You RG, Towbridge RL. Why medical educators may be failing at feedback. *JAMA* 2009;**302** (12):1330–1.
- 18 Sender-Liberman A, Liberman M, Steinert Y, McLeod P, Meterissian S. Surgery residents and attending surgeons have different perspectives of feedback. *Med Teach* 2005;**27** (5):470–2.
- 19 McIlwrick J, Nair B, Montgomery G. ‘How am I doing?’ Many problems but few solutions related to feedback delivery in undergraduate psychiatry education. *Acad Psychiatry* 2006;**30** (2):130–5.
- 20 Gil D, Heins M, Jones PB. Perceptions of medical school faculty members and students on clinical clerkship feedback. *J Med Educ* 1984;**1**:856–64.
- 21 Isaacson JH, Posk LK, Litaker DG, Halperin AK. Residents’ perceptions of the evaluation process. *J Gen Intern Med* 1995;**10** (Suppl):89.
- 22 Holmboe ES, Ward DS, Reznick RK, Katsufakis PJ, Leslie KM, Patel VL, Ray DD, Nelson EA. Faculty development in assessment: the missing link in competency-based medical education. *Acad Med* 2011;**86**:460–7.
- 23 Kogan JR, Holmboe ES, Hauer KE. Tools for direct observation and assessment of clinical skills of medical trainees: a systematic review. *JAMA* 2009;**302** (12):1316–26.
- 24 Watling CJ, Kenyon CF, Schulz V, Goldszmidt MA, Zibrowski EM, Lingard L. An exploration of faculty perspectives on the in-training evaluation of residents. *Acad Med* 2010;**85** (7):1157–62.
- 25 Kogan JR, Hess BJ, Conforti LN, Holmboe ES. What drives faculty ratings of residents’ clinical skills? The impact of faculty’s own clinical skills. *Acad Med* 2010;**10** (Suppl):25–8.
- 26 Kogan JR, Conforti L, Bernabeo E, Iobst W, Holmboe ES. Opening the black box of clinical skills assessment via direct observation: a conceptual model. *Med Educ* 2011;**45** (10):1048–60.
- 27 Norcini JJ, Blank LL, Arnold GK, Kimball HR. The mini-CEX (clinical evaluation exercise): a preliminary investigation. *Ann Intern Med* 1995;**123** (10):795–9.
- 28 Durning SJ, Cation LJ, Markert RJ, Pangaro LN. Assessing the reliability and validity of the mini-clinical evaluation exercise for internal medicine residency training. *Acad Med* 2002;**77** (9):900–4.
- 29 Strauss A, Corbin J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Newbury Park, CA: Sage Publications 1998.
- 30 Patton MQ. *Qualitative Research and Evaluation Methods*. Thousand Oaks, CA: Sage Publications 2001.
- 31 Chamez K. *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis*. Thousand Oaks, CA: Sage Publications 2006.
- 32 Shute VJ. Focus on formative feedback. *Review of Educational Research* 2008;**78** (1):153–89.
- 33 Durning SJ, Artino AR, Pangaro L, van der Vleuten C, Schuwirth L. Perspective: redefining context in the clinical encounter: implications for research and training in medical education. *Acad Med* 2010;**85** (5):894–901.
- 34 Bredo E. Reconstructing educational psychology: situated cognition and Deweyan pragmatism. *Educ Psychol* 1994;**29** (1):23–5.
- 35 Kirshner J, Whitson JA. *Situated Cognition. Social, Semiotic and Psychological Perspectives*. Mahwah, NJ: Lawrence Erlbaum Associates 1997.
- 36 Young MF, Barab SA, Garrett S. Agent as detector: an ecological psychology perspective on learning by perceiving-acting systems. In: Jonassen DH, Land SM, eds. *Theoretical Foundations of Learning Environments*. Mahwah, NJ: Lawrence Erlbaum Associates 2000; 147–72.

- 37 Shepard LA. The role of assessment in a learning culture. In: Desforges C, Fox R, eds. *Teaching and Learning: The Essential Readings*. Oxford: Blackwell Publishing 2008;229–53.
- 38 Davies D, Jacobs A. Sandwiching complex interpersonal feedback. *Small Group Behav* 1985;16:387–96.
- 39 Kaprielian VS, Gradison M. Effective use of feedback. *Fam Med* 1998;30 (6):406–7.
- 40 Milan FB, Parish SJ, Reichgott MJ. A model for educational feedback based on clinical communication skills strategies: beyond the ‘feedback sandwich’. *Teach Learn Med* 2006;18 (1):42–7.
- 41 Burack JH, Irby DM, Carline JD, Root RK, Larson EB. Teaching compassion and respect. Attending physicians’ responses to problematic behaviours. *J Gen Intern Med* 1999;14 (1):49–55.
- 42 Sargeant J, Mann K, van der Vleuten C, Metsemakers J. ‘Directed’ self-assessment: practice and feedback within a social context. *J Contin Educ Health Prof* 2008;28 (1): 47–54.
- 43 Eva KW, Munoz J, Hanson MD, Walsh A, Wakefield J. Which factors, personal or external, most influence students’ generation of learning goals? *Acad Med* 2010;10 (Suppl):102–5.
- 44 Stewart J. To call or not to call: a judgement of risk by pre-registration house officers. *Med Educ* 2008;42:938–44.
- 45 Kennedy TJ, Regehr G, Baker GR, Lingard L. Preserving professional credibility: grounded theory study of medical trainees’ requests for clinical support. *BMJ* 2009;338:b128 .
- 46 Holmboe ES, Ginsburg S, Bernabeo E. The rotational approach to medical education: time to confront our assumptions? *Med Educ* 2011;45 (1):69–80.
- 47 Schwartz A, Pappas C, Bashook PG, Bordage G, Edison M, Prasad B, Swiatkowski V. Conceptual frameworks in the study of duty hours changes in graduate medical education: a review. *Acad Med* 2011;86 (1):18–29.

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