Chapter 5
Clinician Peer Exchange Groups (C-PEGs): Augmenting Medical Students' Learning on Clinical Placement

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5.1 Introduction

For fully qualified clinicians, the most potent learning tends to emerge from experience. Expert practitioners often learn from their own workplace experiences, as well as vicariously from the experiences of others through peer interactions. For undergraduate students, learning is usually targeted at passing formal examinations and guided by a documented curriculum. For clinicians, learning is targeted at the daily problems encountered in the workplace. Formalized opportunities for final year medical students to exchange their clinical learning experiences with peers may provide a bridge for them to learn more like a professional.

This chapter describes our experience with a novel peer learning activity, Clinician Peer Exchange Groups (C-PEGs). C-PEGs were introduced as a forum for final year medical students on clinical placement to come together and share learning with their peers. C-PEGs took the form of multiple, peer-only, face-to-face groups of five students with relatively open-ended topics for discussion. These design elements helped to create a safe learning environment for students to share content that mattered to them. The scheduling of C-PEGs sessions throughout a clinical placement meant that students were able to discuss experiences while they were still fresh and this helped to engage the students with the process of reflection in an authentic and natural way. Both the design and evaluation of the C-PEGs activity will be presented in the body of this chapter. The evaluation results

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demonstrate that C-PEGs have value for learning, peer connection and peer support. The potential value of C-PEGs for final year medical students is heightened when considered as a scaffold for the lifelong learning skills of the reflective practitioner.

Learning through the experiences and challenges of day-to-day practice, as opposed to studying for an exam, is characteristic of learning post-graduation. This peer-based discussion should be introduced prior to graduation so that students (and, in turn, graduates) are primed to optimize their learning from experience. C-PEGs provide a mechanism to achieve this reflection on action. Finally, implications for practice are discussed along with directions for further research to examine the development of reflective capacities in health professional students.

5.2 A Personal Introduction from the Teacher (The First Named Author of This Chapter)

I observed a curious phenomenon in the classroom recently. A student had just finished a case presentation to a group of 30 final year medical students. He then flicked up his final slide which contained one word "reflection" and said "I would like to share with you a reflection about this case". At this point, all of the students looked up and the room was silent with anticipation. His reflection was about how a registrar, his senior, had broken the news to their patient that she would need her little toe amputated. The registrar was brief, direct and left in a rush, not giving the patient an opportunity to ask questions. After the registrar left, the patient started to cry at the prospect of losing her little toe. The student did his best to console her. The student knew the registrar to be a kind and compassionate doctor. As he tried to make sense of what had happened, he realized that, for the registrar, who is used to amputating feet and limbs, the loss of a little toe is very minor, but for the patient it was a big deal. The message he learnt from the case was that we cannot assume how a patient will feel about their treatment plan, so we need to ask them. At the conclusion of his sharing of this reflection, colleagues gave him a loud and heartfelt round of applause.

This was a thought-provoking episode for me to witness because at my institution, the students often tell the faculty about their distaste for reflective tasks. There is no surer word than "reflection" to elicit plaintive groans from students. Yet, in the situation described above, every student became noticeably more engaged at the prospect of hearing about another student's reflection and was clearly appreciative of the student sharing his experience and insight. Was this because the reflection was spontaneous, rather than mandated? Perhaps students like to reflect and share their experiences but only if they can choose when and what and how to share things that matter to students or things that have had some impact. Schon has written about triggers for naturally occurring reflection (Schon, 1983), as summarized clearly by Kinsella:

> Schon suggests that, in practice, reflection often begins when a routine response produces a surprise, an unexpected outcome, pleasant or unpleasant. The surprise gets our attention. When intuitive, spontaneous performance yields expected results, then we tend not to think about it; however, when it leads to surprise, we may begin a process of reflection. (Kinsella, 2007)

On the same concept, Boud (personal communication) uses the analogy of "a stone in the shoe", a trigger that demands action or at least consideration (Molloy, Borello, & Epstein, 2013). As educators, how can we target our teaching to these instances of cognitive dissonance that occur for our students while on placement in a timely and meaningful way?

Health profession educators broadly assume that to become successful practitioners, students need to practice being reflective (Mann, Gordon, & MacLeod, 2009). There is a wealth of educational strategies to help develop reflective capacity in our students. These include written reflections on patient cases, learning portfolios, debriefing following simulation experiences and writing about critical incidents. However, are we giving students the opportunity to talk about the "stone in their shoe" in a timely fashion, particularly when they are immersed in the clinical environment and relatively isolated from other medical students? How can we do this without students feeling forced to reflect? That is, for students to become reflective rather than simply engage in reflection when asked.

The origin of Clinician Peer Exchange Groups (C-PEGs) was a teaching challenge. I had just taken on the role of student coordinator at my hospital, and I wanted to improve the weekly face-to-face teaching session for a group of approximately 35 students. The pre-existing session was adequate, with student case presentations and a lecture. However, much of the learning was passive. There was not an obvious sense of community amongst the students as evidenced by their lack of casual conversation during breaks. The students did not seem to know each other very well, and when they were not at the teaching session, they were out on the wards working within their units as the sole medical student or as one of a pair of medical students. Social cohesion amongst the students was not helped by the random allocation of placements for a cohort of 400 students, who only came together once a week for 6 weeks. Cohesion would gradually develop over each 6-week block, as evidenced by a growing need for crowd control measures, and then the students would move to a different hospital, with a new set of students. Based on my prior knowledge of final year medical students and their programme, I knew they were learning a great deal and having interesting and challenging experiences out on the wards. Given the broad mix of clinical units amongst which the students were dispersed, they would also have been learning different things and having unique experiences, yet when they gathered together, there were limited opportunities for talking about their ward-based learning experiences. They mostly sat in rows and listened passively to someone else speaking at the front of the class. It seemed that there was a wealth of experiences that remained unarticulated and learning that was not shared amongst the group. This untapped educational resource material was ripe for use. As a consequence, I wanted to design an activity that would harness and amplify students' own clinical experiences, get them talking to each other, teaching each other, and

encourage the development of reflective capacities that would potentially have a life beyond the scheduled activity.

A key factor influencing the design of this activity was my own experience of the effectiveness of learning from the stories of peers' experiences. This exchange of stories from clinical practice has been a consistent feature of my ongoing education through the continuum of my medical career, from medical student to a practicing emergency physician of 15 years. The most powerful lessons have been the cautionary tales, stories of others' mistakes and near misses. These stories would prompt me to read, find out more and plan what I would do if I were in the same situation. I can still recall many of them, and they have helped steer my practice, particularly in risky patient situations and challenging interpersonal scenarios. The opportunity to exchange experience and knowledge between peers is often formalized for doctors who have completed their specialist training. By way of example, a number of my specialist colleagues attend and greatly value "journal clubs", peer learning sessions with other medical specialists where knowledge and experience is shared in a structured but relaxed setting. If experienced clinicians make time to attend this kind of activity, perhaps the students would value it too. It would also give the students an experience of a useful mode of learning for their future career.

These ideas helped to shape my approach to the teaching challenge. I concluded that the best way to improve the designated teaching slot was to design an educational activity for a group of 35 students during which students could share their ward-based experiences with each other. The aims of the session would be to promote a sense of community, learn from each other, encourage reflection on ward-based experiences and provide students with an opportunity to experience a form of learning that is prevalent amongst qualified doctors – an exchange of learning and experiences between clinician peers.

5.3 Designing C-PEGs: Core Assumptions

Designing a purposeful learning encounter for students requires some premises and assumptions, because educational interventions are intentional and directed towards achieving particular goals. As a consequence, it is important to have a set of core assumptions that shape the intended intervention, including how it may be experienced and the way in which it could be evaluated. Based on the literature and personal experiences as learners and clinical teachers, the research team made the following assumptions about students' learning that helped to inform the design of the new activity. Firstly, by the final year of the medical course, students have many pockets of deeper, specialized knowledge as a result of immersion in clinical units where they are involved with particular patient cases and service teams (Billett, 2016). These deep pockets of knowledge are important because, by virtue of students' unique experiences, all students participating in C-PEGs will have knowledge and experience of value to share. This is in contrast to peer learning activities in earlier years of the course where students' learning experiences are more uniform

and the most diligent students have a disproportionate capacity to make valuable contributions.

Other informative assumptions are that students like to interact with each other, are interested in hearing about their peers' experiences on the wards and often feel "safer" to talk about their knowledge gaps or practice deficits with peers (Tai et al. 2014, Tai et al. 2016). Students who are nearing graduation and employment are thirsty for practical tips and any knowledge or artefact that will help them on the job; this is a shift from the pervasive "exam focus" of students in the earlier years (Elizabeth Molloy & Keating, 2011). Practical information for work is exactly the kind of knowledge students will be learning on placement and can contribute during C-PEGs. A focus on work place experiences will help to ensure relevance of the C-PEGs for students nearing graduation. Another core assumption is that students have abilities to teach others, as well as to reflect, to think about the patient's perspective, ethics and culture; but there seems to be little time afforded in the classroom or the workplace setting to support these conversations (Topping & Ehly, 1998). Attempts at teaching domains of practice such as communication, professionalism, ethics and reflective practice, without tight integration with clinical practice, typically fall short (Delaney & Molloy, 2009). C-PEGs would provide a clinically integrated opportunity for students to engage with these topics should they choose to do so.

These assumptions informed key design features of C-PEGs. The placement of C-PEGs within a clinical rotation, where communication, professionalism, and ethical issues are being encountered on a daily basis, was seen as the ideal time to share experiences and reflections on these challenges. The combination of assumptions also indicated that C-PEGs might actually work most effectively without direct facilitation from a teacher. This particular combination of factors is as follows: all students have something to offer by virtue of their unique experience; motivation for learning practical tips is high for final year students; they like to talk to each other; they are capable of teaching each other; and, at least collectively in the final year, they have a broad and sophisticated perspective on patient care.

5.4 The Design Challenges

The challenge was to come up with an activity that has a high learning yield for students and low preparation and resource requirements for the teacher. To be effective, the learning would need to be active, with all students contributing in some way. Drawing on the clinical experiences the students have on the wards would help to promote relevance and meaning. In response to this challenge, a version of small group peer discussion was devised that we initially called learning circles, as the activity shared some common properties with reflective small groups known as learning circles in the nursing literature (Hiebert, 1996). After discovering the students consistently found the name "learning circles" to be unpalatable; the name was changed to Clinician Peer Exchange Groups (C-PEGs). C-PEGs involved

dividing the students into groups of five and inviting them to share experiences and new learning from the previous weeks on placement. Small group peer discussion is a well-utilized educational method in the health professions. There were two unique features of this version of small group peer discussion at the undergraduate level. Firstly, there was student membership only in the small groups of five, and secondly, the topics to be shared were largely open-ended and student-determined. Students were asked to share something they have learned, or an experience, from their placement. The shared item could represent a technical fact or an evocative experience. It could be something impersonal or something personal; it just needed to be related to one's learning.

The decision not to have the small groups directly facilitated by a teacher was initially a pragmatic one: a way to have small group learning for seven groups of five students, all at the same time in the one room, with just one teacher. Leaving the students to talk amongst themselves about placement experiences may not represent best practice, but we justified it as a way to achieve small group learning in a cost neutral way. Of note, the teacher still had oversight of the room, and, based on our assumptions about the learners as described earlier, we thought it could potentially work well. The decision to have the discussion topics relatively open-ended was exploratory. We were curious to learn what students would choose to talk about when left to their own devices. It would also give students the freedom to focus the discussions on their most stimulating recent ward experiences. Along with promoting learning within the session, we hoped the activity might influence students' learning behaviour before and after the session. We expected that students would be more conscious of critical incidents and 'learning moments' on the ward that might be of interest to their peers.

Prior to the commencement of the C-PEGs, our main concern was lack of buy-in by the students; sitting in a circle and sharing may not be palatable or comfortable for every student. We also wondered if the lack of direction of the small groups would be a problem, but hoped the students' maturity and considerable experience of small group learning activities and peer learning in the earlier years of the course would provide a sturdy foundation on which to build (Tai, Haines, Canny, & Molloy, 2014).

In summary, two main design challenges helped to shape unique aspects of the C-PEGs activity. Firstly, a desire for small group peer discussions combined with the need to minimize teaching costs leads to consideration of multiple un-facilitated peer-only small groups. However, this risks the groups' abilities to stay focused and engaged, as students are used to looking to the teacher for direction and answers. Secondly, the open-ended nature of discussion topics was a result of wanting to ensure students have the opportunity to speak about what matters to them and also to provide insight for the research team about what it is that students choose to talk about in a formalized setting for peer exchange. The risk with loose discussion topics being that it may add to the challenge of the group remaining on task; sometimes it can be hard to know what to talk about when you can talk about anything. Given these novel aspects of C-PEGs, and their associated risks, it was important to evaluate the introduction of this new activity.

The next section of this chapter will highlight relevant literature that underpins the argument for an activity like C-PEGs. This is followed by a detailed description of the C-PEGs.

5.5 How the Literature on Learning Circles Informed C-PEGs Design

Clinical placements provide a rich learning environment for health professional students and, if managed appropriately, can help ease the challenge of transition from medical student to doctor (Billett, 2016) (Brennan et al., 2010). However, clinical placements are costly, both in dollar terms and clinician supervisor time. Teaching at the bedside in the setting of clinical care is considered highly valuable and relevant to work (Benjamin, 2015) but could also be viewed as inefficient because the ratio of supervisor to student is often just one to one. Hence, the imperative for educators to employ efficient and effective strategies to optimize the learning afforded by time immersed in the workplace setting. Such strategies can be implemented beforehand, to prime students; during, to help with engagement and attention focus; and after placement, to help students make meaning of their experiences and reinforce learning. Students from the same course, who have a broad range of unique placement experiences, by virtue of a diversity of placements, are well positioned to be able to share experiences and learn from each other during and immediately after placement. Reflective learning circles (Hiebert, 1996) represent one way to harness the 'teachable moments' experienced by one student and make them available to a larger group for their consideration. Such a strategy can greatly augment learning from placement in a cost-efficient way, as the learning of one student is shared with many students. As such, C-PEGs have the potential to be a potent educational method.

C-PEGs were designed de novo but align well with the established pedagogical approach of learning circles, which manifest in a variety of forms and across numerous fields (Dyck, 2012; Hiebert, 1996). MacGregor described a learning circle as "an informal, cooperative way of learning that is based on natural patterns of human interaction" (MacGregor, 1993). Although C-PEGs are formalized in that the sessions are planned, enacted and evaluated, the exchange between students is relatively informal, relaxed and conversational compared to student contributions that may occur during a lecture or tutorial. Specific features of C-PEGs include i) multiple concurrent circles held in the one large room to accommodate a large number of students; ii) small groups that are peer-led with no direct facilitation, although there is a teacher with oversight of the room; and iii) discussion topics that are relatively open-ended. This description of C-PEGs will be elaborated upon in the next section of this chapter, but has been introduced here to compare and contrast with other versions of learning circles described in the literature.

The term "learning circles" is more prevalent in the nursing education literature than in the medical education literature. Two relevant studies describe learning circle activities (Hiebert, 1996; Newton, 2011). Both studies conducted one group at a time, used a facilitator and focused on critical incidents and/or ethical issues. Students initiated the topics of discussion based on their recent experiences on the ward. The aims were to help bridge the gap between theory and practice and to develop critical thinking skills and/or professionalism. In both studies, the learning circle activities were considered to be valuable by students (Hiebert, 1996; Newton, 2011). C-PEGs and these two iterations of learning circles from the nursing literature all share the same core of peer group discussion about recent clinical experiences; the main points of difference relate to the scope of invited discussion items and the presence of a senior facilitator.

There is scant literature regarding learning circles with open-ended experience-based discussion topics for medical students. Two relevant studies reviewed a small trial of Balint groups (Sackin, 1994; Torppa, Makkonen, Mårtenson, & Pitkälä, 2008). Balint groups are a face-to-face, peer-led, small group professional development activity conducted in many countries around the world. Traditionally, Balint groups are for general practitioners, and they restrict their discussion to patient cases that caused distress or puzzlement with a view to improving the doctor-patient relationship (Balint, Courtenay, Elder, Hull, & Paul, 1993). These two studies involving medical students both found that the students wanted to discuss a greater breadth of issues than just cases and their interactions with patients. For example, students wanted to talk about experiences relating to interactions with colleagues, professional identity and the clinical environment. During C-PEGs, the medical students are relatively free to discuss whatever they are most interested in, whether that be particular patient cases, interactions with colleagues or their role within the workplace. This study will help to illuminate what students most want to talk about when given a scheduled opportunity for peer discussion about recent clinical experiences.

To the best of our knowledge, there are no published studies that have examined learning circles for medical students without direct facilitation and the running of concurrent learning circles to accommodate larger groups, as is the structure with C-PEGs. Sackin has identified the importance of a trained facilitator to keep medical students focused on the task (Sackin, 1994). This is consistent with the work of Steinert, who demonstrated that preclinical undergraduate students identified an effective small group tutor as a key element of effective small group learning (Steinert, 2004). A detailed study of a programme similar to C-PEGs, with weekly peer exchange of learning and reflections on placement, but with an experienced physician facilitator and consistent membership of small groups, noted the value of the facilitator in validating the students' experiences and feelings, role modelling and guiding learning. However, the authors surmised that faculty presence may have inhibited open discussion at times (Chou et al., 2011). Self-facilitation may not represent ideal practice at the undergraduate level, but it corresponds with the reality of clinical education and may have some theoretically desirable qualities that stem from students not being under the eye of a tutor (Tai et al. 2014). This balance of

losses and gains because of the absence of direct facilitation of the small groups in C-PEGs will be explored further in the discussion section of this chapter, where we argue for the benefits of a peer-only small group.

5.6 How the Literature on Peer Learning Informed C-PEGs Design

C-PEGs are a same-level peer-assisted learning activity. A frequently cited definition of peer-assisted learning is "people from similar social groupings, who are not professional teachers, helping each other to learn and by so doing, learning themselves" (Topping & Ehly, 1998). Same-level peer-assisted learning, as opposed to near-level, indicates that students are at the same stage of a given course of study. A recent systematic review of same-level peer-assisted learning in medical clinical placements (Tai, Molloy, Haines, & Canny, 2016) found numerous benefits for students participating in peer discussion. These benefits include a greater capacity to reflect on clinical experiences and deal with emotions after participating in group discussions; greater empathy for, and rapport with, fellow students through the sharing of experience in peer discussion groups; enhanced ability to navigate placements by learning from other students' successes and failures; and feeling safe and supported in their learning because there was less reason to feel embarrassed in the presence of peers, compared to in front of a teacher, and students were generally friendly and caring towards each other. These benefits help to justify the implementation of a same-level, discussion-based learning activity like C-PEGs.

Boud explains that the origin of some of the benefits of peer learning stem from the fact that peers share a common experience and a common way of communicating and hence are less judgemental, as described in this quote:

> The advantage in learning from people we know is that they are, or have been, in a similar situation to ourselves. They have faced the same challenges we have in the same context. They talk to us in our own language and we can ask them what may appear, in other situations to be silly questions. (Boud, Cohen, & Sampson, 2001)

Boud also makes the point that peer learning occurs naturally and often, both in day-to-day life and at university (Boud et al., 2001). This is part of human nature; we are curious, social beings who often like to work together and help each other. This leads to the question: Why would a teacher need to schedule an opportunity for students to exchange learning when students are probably already engaging in this kind of activity informally, at a time convenient to them and in a manner of their choosing? This is an important question to ponder, as today's students are time jealous and do not like to be forced to spend time on what they can do more efficiently in their own time if they choose to. Aspects of Boud's views on this question are encapsulated in the following quote:

> Formalising the informal is not intended to give teachers a more prominent or controlling role in informal learning, but to realise the potential benefits of peer learning so that all

> students can benefit from it, not just those who are socially adept or best networked. (Boud et al., 2001)

The students participating in the C-PEGs activity as part of this study probably had limited opportunities to informally learn from and with each other because they were usually not in close physical proximity to other students while on the wards, and friendship groups were unlikely to be placed together at one hospital at any one time given the large cohort of students to be placed.

C-PEGs have many anticipated benefits, and these are supported by the literature on learning circles and same-level peer-assisted learning, but are C-PEGs a worthwhile use of students' valuable time? The C-PEGs evaluation described later in this chapter explores the students' perceptions about the value of the activity. The next section describes C-PEGs in greater detail.

5.7 A Description of C-PEGs

This section provides a description of the context in which C-PEGs was delivered during the evaluation period and an overview of how individual C-PEGs sessions were conducted.

5.7.1 Setting and Duration

The setting for the project was a clinical school within a large community hospital where a maximum of 35 final year medical students were dispersed on a variety of 6-week clinical placements at one time. These placement settings included general and specialty surgical units, general and specialty medical units, intensive care, aged care, rehabilitation and the emergency department. The students were expected to be active members of the medical teams with which they were attached, with a focus on learning, preparing for work as a junior doctor and contributing to patient care. The project that sought to illuminate and evaluate students' experiences of C-PEGs spanned 18 weeks, disposed as three 6-week blocks. A total of 105 students had the opportunity to participate in up to three fortnightly C-PEGs sessions each. Attendance at the teaching sessions was encouraged, but not enforced, because students sometimes had valid competing educational opportunities on their wards which they did not want to miss. On average, each C-PEGs session was attended by 25 students. Nine C-PEGs sessions were conducted, three each with three different groups of 35 students.

5.7.2 Description of an Individual C-PEGs Session

C-PEGs were a 30–40 min activity in which students were divided into groups of five and given half an hour to share an experience and/or a particular learning point from the previous couple of weeks on the ward. After this, time permitting, the teacher would invite one or two groups to share an item from their small group with the whole group of about 25 students, with some commentary from the teacher. The main purpose of this sharing with the large group at the end was to further amplify learning, so the whole group of about 25 could benefit from particular students' offerings, rather than just four other students. A secondary purpose was to satisfy students' curiosity about what other groups had discussed. Groups tended to nominate the student who had the most interesting or useful offering to share with the entire group. Presumably, this vote of confidence from peers made the job of sharing with the whole group less daunting.

The room was large enough to comfortably contain five or six groups of five students sitting in circles. Students mostly moved chairs around to create the configuration. However, some students preferred to sit in groups on the floor. The teacher sat alone and off to the side, within earshot of one or two groups, but not actively listening or participating. Students were instructed to share an experience or something they had learned in recent weeks. The content for discussion could be clinical/technical or behavioural/social. They were not steered one way or the other. They were given a list of discussion triggers to help stimulate thoughts for an item to share (see Table 5.1).

A range of practical strategies was employed to ensure that C-PEGs met their aims of students sharing their learning and their evaluation of experiences through a collective process. These strategies included explanation, provision of examples, clarification and foreshadowing to encourage students to share. Prior to the first session, the teacher explained and provided a rationale for the C-PEGs activity, affirmed the value of the students' unique experiences and emphasized that their different clinical experiences would mean that what they shared was likely to be of interest to their peers and normalized the group process using "journal club" as an example.

Table 5.1 C-PEGs discussion triggers

Share an experience and/or a particular learning point from the previous weeks on placement The following triggers may help you think of something:
A case
Something you were taught
A mistake you (or someone else) made and what you would do differently next time if you had the chance
Your observations of the work done by your unit
Something that surprised, pleased or disappointed you
A brief summary of a common clinical problem on your unit
A description of doing something for the first time. What was it? How did it go? What did you learn?
A challenging situation

Finally, the teacher provided the list of discussion triggers (Table 5.1) and shared some recent authentic examples of her own learning from clinical practice.

At the end of each session, students were asked to make notes on the following four questions: "What topic did you choose to raise with your group?" "What was the most useful thing you learned from today's session?" "Is there anything you would like to learn more about as a result of today's session, if so, what?" and "Is there anything new that you might put into practice on the ward as a result of today's discussion, if so, what is it?" These notes were primarily designed to promote learning by asking students to evaluate what was discussed that was new to them, to consider what knowledge gaps needed addressing and to visualize how this learning could be transferred to their own practice. A secondary purpose for these notes was as a form of data for the project evaluation.

To summarize, this section has described the implementation of a C-PEGs session, covering how students are primed for the session, the room set-up, the focus of discussion including triggers, a mechanism for the small groups to share some items with the large group and the note-making that acts as a conclusion for the session. The next section describes our approach to the evaluation of C-PEGs.

5.8 Evaluation of C-PEGs

The primary aim of the evaluation was to explore student and teacher perceptions of the C-PEGs activity, with a particular focus on its value and how it might be improved. The secondary aim was to learn more about what it is that the students chose to talk about during the sessions and which discussion topics they found most useful for their practice. Ethics approval was granted by the Monash University Human Research Ethics Committee, project reference number 2016 7627 7456.

Data were collected from five different sources so as to provide a broad picture of the impact of the C-PEGs initiative. Multiple data sources also allowed for triangulation of data which added to the clarity of the project findings. Both qualitative and quantitative data were collected. The first data source was student notes which were collected from each student at the end of each C-PEGs session. These provided a large volume of detailed information about the content of students' discussions, what students were learning, what they would like to learn more about and how they might use the new knowledge. The second data source was C-PEGs evaluation forms which were collected at the end of each 6-week placement after students had participated in two or three C-PEGs sessions. They contained Likert scale and free text responses to closed- and open-ended questions, respectively. The third data source was clinical placement evaluation forms. These were also collected at the end of each 6-week placement and allowed for the comparison of the value of the C-PEGs activity with the other teaching modalities being delivered during the placement. The fourth source of data was facilitator's notes which were made at the conclusion of each C-PEGs session and were designed to capture the teacher's impressions of the sessions. The fifth source of data was the transcription of three

focus groups, recorded at the conclusion of each of the three 6-week placements. This focus group data has not been included in the evaluation for this chapter and will be presented in detail in a separate study.

Analysis methods include descriptive statistics of quantitative data and thematic analysis of qualitative data. Free-text comments on the C-PEGs evaluation form were organized into categories by two members of the research team, who then developed themes based on the content and nature of the categories. A similar process was used to analyze the student notes. However, given the more straightforward nature of responses, only one member of the research team categorized, organized and summarized this data.

Efforts were made to minimize students feeling pressured to provide favourable feedback and to complete the forms by ensuring both evaluation forms and student notes could be completed and submitted anonymously. Only students present at the end of each final face-to-face teaching session were asked to complete the evaluation forms. This convenience sample represented just over two thirds of the total number of students who participated in one or more C-PEGs sessions. Of the students invited to complete the evaluation forms, 100% (n = 74) completed the C-PEGs evaluation form, and 96% (n = 71) completed the clinical placement evaluation form. This represents a very high response rate of a large representative sample of students for the evaluation forms. A total of 209 student notes were submitted out of a possible 222. At least 94% (n = 196) of students responded to each of the four questions on the student notes form. This provided a large and representative volume of data about what the students talked about and learnt during the C-PEGs.

5.8.1 Evaluation Findings

The evaluation findings are presented under two headings: i) perceptions of value and ii) evidence of learning. Note that there is some overlap of content between these two sections. Data for the perceptions of value section has three sources: the C-PEGs evaluation form, the end of rotation evaluation form and the facilitator's notes. Data for the evidence of learning section also comes from the C-PEGs evaluation form, as well as the student notes. The implications of these findings will be discussed in detail in the chapter section titled Implications for Health Professions' Education, but first the results will be presented.

5.8.2 Perceptions of Value

Table 5.2 shows the students' responses to the Likert scale statements on the clinical placement evaluation form. This allows a comparison to be made between the students' perceptions of the utility of C-PEGs and the perceived utility of the other educational activities they participated in during the placement. A five-point Likert

Table 5.2 Likert responses comparing perceived value of four different educational activities as per the clinical placement evaluation form

Statement	Agree/ strongly agree	Neither agree nor disagree	Disagree/ strongly disagree	Number of responses
The student case presentations have been useful	95%	5%	0	71
Clinical placement time has been useful	93%	7%	0	71
The lectures have been useful	86%	14%	0	66
The C-PEGs have been useful	64%	27%	9%	70

scale was used on the evaluation form; however, for clarity, in Table 5.2, "strongly agree" and "agree" have been aggregated, as have "strongly disagree" and "disagree". The majority of students (64%) agreed that the C-PEGs sessions were useful, 27% were equivocal and 9% thought the C-PEGs sessions were not useful. In comparison with the other educational activities offered during placement, students rated the C-PEGs activity as less useful than the student case presentations, clinical immersion and lecture series. It should be noted that the learning activities used as a point of reference were all of high quality. For example, at the same time that C-PEGs was introduced, the format for the case presentations was significantly improved. Students went to great lengths to prepare educational case presentations for their peers and were tutored on how to make their sessions more interactive, engaging and effective. Each presentation was followed by large group discussion led by the facilitator, where important points were emphasized and students were questioned on related and relevant material. On the last teaching day of each placement, students participated in a written quiz about the content covered in the student presentations. So, it would have been clear for students to see the large amount of important material covered by these presentations. Although C-PEGs were considered the least useful activity out of four, it was still considered valuable by the majority of students, and the three activities that were rated as more useful were all of high quality and familiar to the students. Of note, C-PEGs was the only activity out of four where some students (9%) disagreed that it was useful. This suggests that C-PEGs does not suit a small proportion of students.

Although C-PEGs rated as the least useful of the four educational modalities on the clinical placement evaluation form, there were many positive responses about C-PEGs on the C-PEGs evaluation form as displayed in Table 5.3. This table shows the Likert scale responses to seven statements from the C-PEGs evaluation form. Once again, "strongly agree" and "agree" have been aggregated, as have "disagree" and "strongly disagree". Eighty-five percent of students agreed that the C-PEGs activity was enjoyable, 86% agreed that the C-PEGs activity was interesting, 64% agreed C-PEGs was worthwhile, 81% indicated they learned new things, 56%

Table 5.3 Responses to C-PEGs evaluation form Likert scale questions

Statement	Strongly agree/agree	Neither agree nor disagree	Disagree/ strongly disagree	Number of students
The C-PEGs were enjoyable	85%	14%	1%	74
The C-PEGs were interesting	86%	13%	1%	74
The C-PEGs were worthwhile	64%	33%	3%	74
I learned new material in the C-PEGs	81%	17%	2%	74
I found it difficult to think of things to talk about	31%	33%	36%	74
I was able to incorporate some of the learning into my clinical practice	55%	38%	7%	72
This activity should continue for future groups of final year students	64%	33%	3%	73

reported that they had incorporated learning from the sessions into their clinical practice, and the majority of students (64%) concluded the activity should be continued for future groups of students. Only 3% proposed that it should be discontinued. Approximately a third of students agreed that it was difficult to think of things to talk about.

Note that the proportion of students who rated C-PEGs as "useful" on the clinical placement evaluation survey (64%) was the same as the proportion of students who rated the activity as "worthwhile" on the C-PEGs evaluation form (64%). This indicates that about a third of students are unsure if the value of C-PEGs justifies the time and effort expended on it. Both of these parameters, "useful" and "worthwhile", will likely be influenced by students' pre-existing notions of what makes for an effective teaching session. Students may not be used to factoring in benefits of a social or emotional nature when evaluating the worth or utility of an educational session. However, these elements are more likely to be included when considering how enjoyable a session was. More students (85%) agreed that C-PEGs was enjoyable.

The C-PEGs evaluation form invited students to comment on what they did and did not like about the activity. Table 5.4 displays a summary of the data gathered in response to the question: "What did you like about the C-PEGs activity, and why?" This data has been grouped according to the three most prominent themes: (1) learning, with the subthemes of sharing of knowledge and experience, interesting content and opportunity for reflection; (2) connection, which represents engagement with peers; and (3) peer support, with the subthemes of safe learning environment, normalization of the student experience and opportunity to debrief with peers. Table 5.4 includes an illustrative quote for each subtheme. The most frequently reported valued aspect of the sessions was the opportunity to meet and share knowledge and ward experiences with peers.

Table 5.4 What students liked about the C-PEGs

Theme	Subtheme	Illustrative quote
Learning	Through sharing of knowledge and experience	"Learnt from the mistakes of others" "Colleagues sharing their experience from a different unit I have not experienced"
	Useful and interesting content	"Good stories came in" "often relevant and interesting things to learn"
	Opportunity for reflection	"It was a good opportunity to reflect on my rotation and what I had actually learnt" "We rarely get a chance to reflect on challenging/ difficult experiences and I think this is an essential process for learning"
Connection	Engagement with peers	"Forced fellowship" "Talking to new people that I otherwise would not have interacted with""Engage with other students"
Peer support	Safe learning environment	"Judgement free zone to talk" "Learning from peers makes things so much less intimidating"
	Normalization of the student experience	"Normalizes the student experience"
	Debriefing	"Discussion and support from peers" "getting to debrief about the week is good"

Table 5.5 What students did not like about the C-PEGs

Most frequent category of response to the question: "What didn't you like about C-PEGs and why?"	Illustrative quotes
Difficulty thinking of items to talk about	"Sometimes difficult to come up with things to share"
Lack of structure	"Occasionally the circles derailed and lost focus" "Too unstructured. No-one prepared materials"
Lack of engagement	"It was hit and miss what fellow students chose to share. The quality depended on how motivated the fellow student was"
Time issues	"Very little time allocated" "A bit time consuming" "Felt a little like wasted time"

Students were also asked what they did not like about C-PEGs. Table 5.5 presents a summary of the data gathered in response to the question: "What did you not like about the C-PEGs activity, and why?" This data has been grouped into four prominent themes: (1) difficulty thinking of items to talk about, (2) lack of structure, (3) lack of engagement and (4) issues of time, both too much and not enough. There was a diversity of opinion about the impact of structure, with some students suggesting a clinical facilitator and more steps to follow in the sessions would help, and others identifying the open structure as a key strength. The majority of students thought the C-PEGs should not be facilitated by a teacher (54%). Approximately 20% of stu-

dents felt that nominating a student to chair would be beneficial (21%), and a quarter would have preferred a clinician educator to facilitate the small groups (25%).

To an observing facilitator, as per the facilitator's notes, the students seemed to have no trouble finding things to talk about. The noise level would rise instantly at the start of the session, and it was often hard to get the students to finish talking at the end. There was lots of smiling and laughter at times. The body language was generally positive too, with students leaning in and obviously interested and engaged. On the surface it looked really positive. There were occasional instances of group discussion petering out, but these were infrequent and brief.

In summary, most students enjoyed C-PEGs and perceived it as a useful activity. However, a minority of students did not find the sessions worthwhile. Students liked the learning, the connection with their peers and the normalization of student experience afforded by C-PEGs. Common criticisms of the C-PEGs included its lack of structure, difficulty knowing what to talk about, lack of engagement and issues around time.

5.8.3 Evidence of Learning

In this section, we present evaluation results pertaining to perceptions of learning, self-reports of changes in learning behaviour, self-reports of transfer of learning to the ward and data about the breadth of topics discussed. The data for this section comes from the student notes and the C-PEGs evaluation form.

Analysis of the student notes demonstrates that there was a vast and rich array of highly practical, relevant and important information shared between students during the C-PEGs. Table 5.6 lists the various categories of discussion topic; each category has one or more example quotes. There was an even mix of medical/technical content and non-technical content. Clinical cases were frequently shared, either because the conditions were relatively rare, a mistake had been made or there was something confronting about the case such as a poor patient outcome, end-of-life issues, futile care, refusal of medical treatment, patient complaint or patients with a challenging demeanour. Many cases acted as a cautionary tale with a strong take-home message. Many mistakes were shared, mistakes of others and their own. Other categories included hospital systems, sociocultural aspects of the workplace and being a student and patient perspectives and attitudes towards patients.

As per the C-PEGs survey evaluation data, students' most valued form of contribution from others was the description of an interesting case, anecdote or mistake, complete with a clear learning point. They also appreciated practical tips, or heuristics, relevant to their current and future work as a junior doctor.

As shown above in Table 5.3, Likert scale data demonstrates that the majority of students reported the sessions to be useful and beneficial for learning. The student notes data triangulate with this indirect evidence of learning, with hundreds of student quotes describing what they had learned. The next question for consideration is whether the activity had any effect on learning beyond the half-hour C-PEGs ses-

Table 5.6 Categories of discussion topic

Topic of learning theme	Example quotes
Medical/technical knowledge	"Complications of prolonged anaesthesia"
Medical/technical practical tips	"Always check equipment if someone has set up for you"
Non-technical practical tips	"While making a referral, pause after the opening spiel to allow time for questions"
Cautionary tales with a message	"Never assume! Always clarify – Even in the face of perceived barriers e.g. a too busy consultant" "Always double check the operative side" "Examine every patient and rule out red flags, always!"
Exploring mistakes and errors	"Doctors are just human and can make errors in judgement" "Bonded over mistakes on the wards and reflecting on the learning experience"
Hospital systems	"Phone interpreters are very accessible"
Sociocultural aspects of the workplace and being a student	"Learning how to say 'no' to some work that is given to you if you feel it is not suitable" "Hierarchies"
Patient perspective and attitudes towards patients	"Empathy for patients" "Every person deserves our best care – Even IVDUs (intravenous drug users) and criminals"

sions. In the C-PEGs evaluation form, 55% of students agreed that they had been able to incorporate some of the learning from C-PEGs into their clinical practice, whereas most other students were neutral. In the free text section of the form, some students said that they had not done so yet, but given more time and opportunity they would. Examples of learning from C-PEGs being transferred to students' practice on the wards, as reported by students, included the following: better perspective of what was happening in the wards; greater ability to avoid errors as a result of awareness of hazards; more vigilance and a reluctance to repeat the mistakes of others; improved clinical skills, particularly procedural skills; and improved referrals to other units after learning from students on other units about what makes a good referral for that unit. In the C-PEGs evaluation form, students were also asked if the sessions influenced learning behaviours in any way. Many students responded positively to this question. Table 5.7 lists the most frequently reported responses to the following question in the student notes: "Did the C-PEGs influence your learning behaviours in any way? If so, please explain". Each item in the list has one or more accompanying illustrative quotes. The most frequently reported behavioural changes included shifts in attentional focus on the ward, reflection, reading up before and after sessions and a greater awareness of hazards and efforts to avoid repeating other's mistakes.

In response to the question on the student notes, "What was the most useful thing you learned from today's session?", most students wrote a discussion topic similar to that listed in Table 5.6. However, some students responded by reporting what they had learned about learning itself. Table 5.8 contains this detail, along with a few illustrative quotes. For example, some students reported that they learned the value

Table 5.7 Did the C-PEGs influence your learning behaviours in any way? If so, please explain

Most frequent responses	Illustrative quotes
Attentional focus on the ward	"Yes, I started paying more attention in the wards as there are important things to learn even from boring routine tasks in the ward"
Reflection	"Think more about critical issues that commonly occur on the wards" "Yes. Critical and constructive thinking prior to sessions" "Yes. Thought/reflected on interesting cases"
Reading	"Reading up on things before session" "Went home and did more reading" "Jogged memory of things we should refresh"
Awareness and avoidance of hazards	"Being more mindful of others' mistakes"

Table 5.8 Most useful thing you learned from today's session

Learning about learning	Illustrative quotes
Value of learning through peer exchange	"To acknowledge each others' gap in learning and work together to fix it" "Good to reflect on each others' experience"
Value of learning from errors	"Sharing our mistakes is useful to learn and remember when we are in the same situation" "Learn from yours and others' mistakes"

of learning through peer exchange, and other students noted the educational benefit of talking about errors. Two students stated they would do "more peer sharing" as a result of the session. Another student learned "not to lose heart, keep learning". Although "learning about learning" was not a frequent category of response, it does imply long-term positive consequences for the individuals. These comments also highlight that not all students were aware of the benefits of learning from peer exchange prior to their C-PEGs experience.

The evidence for learning from C-PEGs is strong. Not only have students learned a broad range of highly relevant material to help them on the job; a majority of students report that they have transferred some of this learning to their practice on the wards and that the C-PEGs have had a positive influence on their learning behaviours.

5.9 Implications for Health Professions Education

It is encouraging that the majority of students valued and enjoyed the C-PEGs sessions and there is scope for improvement for the next iteration of the activity. However, a few students did not find C-PEGs worthwhile, and a few more were unsure about its value. This is not a surprising result for several reasons: C-PEGs is an activity that requires effort, the outcomes are unclear at the start of each

discussion, and the students are fully responsible for how useful the sessions are. Furthermore, the most valuable learning requires a degree of private and public vulnerability, and the social nature of it may be challenging for more introverted students. It is possible that the current generation of medical students would feel more comfortable sharing insights and learning in a digital setting rather than face-to-face (Kori, Pedaste, Leijen, & Mäeots, 2014). However, the practice of modern medicine is still largely conducted in a face-to-face context, and often the subject matter is challenging and involves communicating with and educating others, usually patients and their families. So, despite some students' reluctance, the face-to-face format of C-PEGs aligns very well with the usual mode of communication required of a doctor. It may be that C-PEGs is most instructive for those students least comfortable with it.

This evaluation suggests that C-PEGs was mostly well received by students and has sufficient educational value to warrant an expansion of the programme for final year medical students from our institution who are out on placement. However, what have we learned from this project that may have broader implications for educators in the health professions? In this section we will discuss three aspects of the project findings that potentially have more broad applicability. These are: the unique design elements that contributed to the success of C-PEGs; peer discussion of cautionary tales and learning from error; and the development of reflective practitioners.

5.9.1 How the Design Elements of C-PEGs Promote Learning

There was a diversity of opinion amongst the students about the adequacy of structure and direction of the C-PEGs sessions. Two design elements contributed to the relatively loose structure: the student-only nature of the small groups and the openness of the discussion topics.

The student-only composition of the C-PEGs started as a compromise to minimize costs. However, our results and the literature indirectly suggest that this may be a key element of the effectiveness of C-PEGs. The absence of a teacher in the small groups probably lowered the threshold for what students were comfortable to reveal; there would have been less pressure to be impressive (Tai et al., 2016). It is speculated that the students felt more comfortable to speak honestly and reveal their areas of knowledge deficit and/or mistakes without a teacher listening in. The teacher did, however, prime students beforehand in various ways, including role modelling, for honest conversation. No doubt it was more fun and relaxed without a teacher. The positive and affirming benefits of peer socialization, cited as a key benefit, would likely be diluted with a teacher directly present in the mix. These benefits need to be balanced with the lack of direction that can result in the absence of a non-peer facilitator. However, this negative corollary can be mitigated in other

ways without having to dilute the benefits of a peer-only discussion. Not having a teacher present is at odds with students' general perceptions of effective formal education. However, once the students leave university and enter the clinical environment as doctors, they will have greater responsibility for their own learning, much of which will come from how they learn from their daily workplace experiences and from conversation with their peers, not from a teacher at the front of a classroom. In summary, the absence of a facilitator within the small groups is a key design element of C-PEGs and probably results in less inhibition, greater capacity for peer support and the fostering of learning from experience in the absence of a teacher, an important lifelong approach to learning.

The positioning of the discussion topics as open-ended was chosen for two reasons: firstly, for the researchers to learn what the students choose to discuss and, secondly, to provide a forum for students to talk about their most resonant recent ward experiences, an opportunity to talk about the "stone in their shoe", whatever that may be. This open-ended construct is a key element of the C-PEGs' effectiveness because it ensures that what the students discuss is meaningful and contextually timely for them. In addition, it allows a forum for reflection with peers without the pressure to share anything of a personal nature if that is the student's preference. They could opt to explain a fact or share a confronting experience. This choice probably helped to create a safe learning environment. There was no pressure to reveal one's self, but they were free to do so if they wanted. Consequently, any offerings of this nature were likely to be more authentic than the reflections that students are sometimes required to produce on demand. A problem associated with this open-ended approach, as indicated by the data, is that some students had difficulty thinking of items to share. A narrower focus might have made it easier for students to recall relevant experiences. However, this would be at the expense of addressing what matters most to students at that time.

The design features that contribute to the C-PEG's uniqueness and effectiveness, such as the face-to-face format, peer-only groups and open-ended topics, come at the expense of a firm structure, clear direction and some students' preferences for learning format. Rather than abandon the unique elements, our approach is to make minor modifications that ameliorate the negative effects of the mostly positive design elements. These modifications would be aimed at providing students with the option of more guidance on how to conduct the sessions and the provision of strategies to assist students with topic identification.

It is worth emphasizing another key design element for the effectiveness of C-PEGs. The students who participated in this study *all* had something valuable to offer to their peers. They were in the final year of their medical degree with a depth of knowledge and variety of experience. This may not be the case for students in earlier years, who have had less opportunities to differentiate and are more focused on passing exams than learning how to survive in the workplace.

5.9.2 Cautionary Tales and Learning from Errors

Evaluation data demonstrate that a vast array of discussion topics were raised by the students in the C-PEGs. A striking feature of these data was the prevalence and impact of cautionary tales. Students were surprisingly candid in their sharing of difficult encounters and were prepared to identify their own shortcomings, mistakes and discomfort. The students' capacity to speak constructively about errors, their own and others', may be partly due to their prior and intercurrent formal education in the area of patient safety (Marshall, Harrison, & Flanagan, 2008). Topics such as why errors occur, institutional and personal responses to error, the learning curve, workplace culture, diagnostic error, effective teamwork and communication, speaking up and human factors may have helped the students to tune into these classic problem areas of modern medicine and given them a framework to think constructively about suboptimal performance in the workplace.

Learning from mistakes is a common and well-accepted educational strategy for clinicians at both an individual and institutional level. The patient safety movement of recent decades has fuelled much progress in this area (Donaldson, Corrigan, & Kohn, 2000). A longstanding example of an institutional approach to learning from error is the practice of formal morbidity and mortality meetings, where suboptimal patient outcomes are discussed as a means to improve care for future patients. It is recognized that these meetings are of a highly sensitive nature and need to be chaired with care because it is challenging to acknowledge and learn from one's shortcomings (Orlander, Barber, & Fincke, 2002).

It is imperative to consider how undergraduate health professionals are prepared to learn from error. Elements of preparation should probably include an understanding of why errors occur, a growth mind-set (Dweck, 2017; Klein, Delany, Fischer, Smallwood, & Trumble, 2017), experience of reflective practice, positive role modelling and some practice while still a student, when the stakes are relatively low. If students are not well prepared to acknowledge and learn from their errors, there is a risk that maladaptive responses to error may result. These may take the form of blaming others, which results in a failure to learn and improve and a defensive workplace culture, or the development of a disproportionately negative view about their capability, which can have serious consequences for mental health and career choices. C-PEGs provide an opportunity for students to practice learning from error, mostly the errors of others. Some students felt comfortable enough to talk about their own errors, and all students were reminded that errors are common and that they are not alone in the challenges of being a student.

There is a related broader educational question of how we assist students and trainees to navigate the tension between the need to be impressive and the need to acknowledge their shortcomings, both privately and publicly. The need to be impressive stems from the human desire to maintain face, to achieve well in assessments and elevate career prospects. However, acknowledgement of shortcomings is required to learn and develop expertise (Boud et al., 2001), to teach and mentor others (Bearman & Molloy, 2017) and to promote patient safety (Donaldson et al.,

2000). If we can help students and trainees with this tension, we may be able to significantly enhance the capacity for learning in the current system. C-PEGs is a forum where students can experiment with being "a little bit vulnerable" in front of fellow students and experience the benefits that come from sharing their learning experiences with peers. Equally, if the foundations of professionalism are built on "the ability to support the learning of self and others" (Wilkinson, Wade, & Knock, 2009), then C-PEGs could be part of the educational strategy to promote professionalism.

More research is needed to explore the characteristics of learning environments that help students to feel comfortable to share their mistakes with peers. How can they be supported, and what benefits could this style of education have on the culture in medicine? In large and competitive cohorts of medical students, the utility of such an approach to lower the threshold to reveal academic or other vulnerabilities could have far-reaching benefits for students' wellbeing and learning. A limitation of this study was that we relied on students' self-report of their experience of C-PEGS. Future studies could adopt an observational approach to further understand how students are prepared to be vulnerable in front of their peers and the types of linguistic mechanisms or environmental conditions that facilitate open exchanges between same-level peers on clinical placement. A complication of course with an ethnographic study design is that the presence of a researcher or video camera may interfere with the psychological safety required for open disclosure within the groups.

5.9.3 The Development of Reflective Practitioners

To reap the learning benefits of immersion in the workplace while on placement, students need to be able to reflect. This requires effortful thinking about new and challenging experiences resulting in greater insight and understanding and, hopefully, changes in practice (Schon, 1987). A systematic review on reflection and reflective practice in health profession education concluded that reflection seemed to be able to be developed given the right conditions. These conditions included an authentic context, a safe and supportive atmosphere, small group discussion, accommodation for individual differences in learning style, free expression of opinions, perception of relevance, time to reflect and conducive behaviour of mentors and supervisors (Mann, Gordon, & MacLeod, 2007). C-PEGs neatly satisfy a number of these conditions, in particular, an authentic context and a safe and supportive atmosphere. With C-PEGs, authenticity is achieved in two main ways. Firstly, the placement experience is usually challenging and sometimes confronting so that students experience situations that naturally trigger reflection. Secondly, students are not forced to share an evocative experience; they can share something purely technical if they prefer. This choice means that when reflections of experiences with an emotional layer are shared during C-PEGs, they are very likely to be genuine. Another conclusion of this systematic review by Mann and colleagues on the teaching of

reflection in the health professions is that more research is required to elucidate effective strategies for teaching and learning reflective practice (Mann et al., 2007). This evaluation of C-PEGs contributes to a growing body of knowledge in this area.

The C-PEGs made some students think more about what they were learning on the wards. This spotlight on learning associated with immersion in the workplace could help to better illuminate learning opportunities for students in the moment. Having to then share learning with peers encouraged additional mental effort to refine learning. Our data show that this effect was apparent to some students after only two or three sessions. A significant limitation of this evaluation project is its short duration. Further research examining the positive effects on learning behaviours from more frequent C-PEGs sessions over a longer period of time is warranted. Such research could help to establish this kind of educational activity as a method of preparing students for a career of lifelong learning through reflective practice, with an enhanced capacity to learn from conversation with colleagues and daily workplace experiences.

5.10 Collaborative Learning with Peers

C-PEGs were introduced as a forum for students on clinical placement to come together and share learning with their peers. The face-to-face groups of five students were peer-only, and the discussion topics were relatively open-ended. These design elements helped to create a safe learning environment for students to share content that mattered to them. Both technical information and reflections were shared and valued, often in the form of clinical cases, acting as cautionary tales with strong take-home messages.

Sharing of placement learning and experiences in face-to-face peer-only discussion groups has potential to be an effective and feasible educational strategy to augment the learning from clinical placement experiences for particular student groups. We surmise that the important conditions for success of C-PEGs are as follows: participants with diverse and relevant placement experiences to share; participants who are close to graduation and hence eager to learn about their peers' experience of, and learning from, the workplace environment; participants with experience of peer learning; and participants who have sufficient foundation knowledge to assist their reflections on workplace experience.

The C-PEGs activity holds educational value for final year medical students. The main benefits are social and educational, with clear evidence of learning about technical and "non-technical" domains of practice. There is some self-reported evidence to suggest that learning behaviours and practice can be positively influenced beyond the sessions. Further research is required to determine if regular participation in C-PEGs could help students learn to talk more openly about their own and others' mistakes and shortcomings as a way of promoting learning and support and enhance students' inclination for reflective practice and peer discussion as modes of lifelong learning. This evaluation raises these worthwhile endpoints as possibilities.

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