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Effectiveness of a rural longitudinal integrated clerkship in preparing medical students for internship

Hudson H. Birden

University of Sydney, HUDSONB@MED.USYD.EDU.AU

Jane Barker

University of Western Sydney, JANEBAR@UOW.EDU.AU

Ian G. Wilson

University of Wollongong, IANWIL@UOW.EDU.AU

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Abstract

Background: We interviewed graduates from the first two cohorts of a postgraduate medical program that had a senior year longitudinal integrated clerkship (LIC) in a practice setting in rural New South Wales, Australia to determine how well their training prepared them to be junior doctors (3-4 years after graduation), and what aspects of that training they thought were particularly useful. **Methods:** In-depth interviews. **Results:** Fourteen junior doctors were interviewed. Participants reported feeling well prepared in ability to develop close relationships with clinical supervisors, good clinical and procedural skills, ability to work autonomously and work in teams, knowledge of health systems, ability to ensure self-care, and professionalism. Consensus view was that a rural placement was an excellent way to learn medicine for a variety of reasons including relationships with clinicians, less competition for access to patients, and opportunities to extend their clinical skills and act up to intern level. **Conclusion:** The advantages we found in the training these junior doctors received which prepared them well for internship were integral both to the longitudinal, unstructured placement, and to the fact that it was carried out in a rural area. The two aspects of these placements appear to act synergistically, reinforcing the learning experience.

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Effectiveness of a rural longitudinal integrated clerkship in preparing medical students for internship

Hudson Birden^{1,4}, Jane Barker², Ian Wilson³

1 James Cook University, Australia, 2 University of Western Sydney School of Medicine, Australia, 3University of Wollongong, Graduate School of Medicine, Australia, 4 University of Sydney, Australia

Abstract

Background

Longitudinal Integrated Clerkships (LICs) have proven to provide effective learning environments for late-stage medical students, particularly in rural settings. We interviewed graduates from the first two cohorts of a rural LIC to determine how well their training prepared them to be junior doctors, and what aspects of that training they thought were particularly useful.

Methods

We conducted in-depth interviews with graduates of a postgraduate medical program in NSW Australia that had a senior year longitudinal integrated clerkship in a rural practice setting as the penultimate year of their training.

Results

Thirteen junior doctors were interviewed. Participants reported feeling well prepared in several aspect of practice; ability to develop close relationships with clinical supervisors, good clinical skills, good procedural skills, ability to work autonomously, ability to work in teams, knowledge of health systems, ability to ensure self-care, and professionalism. The consensus view was that a rural placement was an excellent way to learn medicine for a variety of reasons including relationships with clinicians, less competition for access to patients, and opportunities to extend their clinical skills and act up to intern level in the absence of other junior staff.

Conclusion

The advantages we found in the training these junior doctors received which prepared them well for internship were integral both to the longitudinal, unstructured placement, and to the fact that it was carried out in a rural area. The two aspects of these placements appear to act synergistically, reinforcing the learning experience.

Introduction

Longitudinal Integrated Clerkships (LICs) have proven to provide effective learning environments for late-stage medical students (Daly, Roberts, Kumar, & Perkins, 2013; Latessa et al., 2015; Norris, Schaad, DeWitt, Ogur, & Hunt, 2009) particularly in rural settings (Birden & Wilson, 2012; Van Schalkwyk, Bezuidenhout, & De Villiers, 2015; Walters, Prideaux, Worley, & Greenhill, 2011). LICs extend the apprenticeship model of medical education, the continuity of care and longitudinal experience with patients providing learning advantages through the LIC model, along with more direct mentoring, and experience working in teams (Couper, Worley, Strasser, & Strasser, 2011).

Through the extended association between clinician educator and student, medical students become trusted to take on more of the role of a practitioner, to 'act up' (Brennan et al., 2010), in a carefully supervised structure (Hirsh, Holmboe, & ten Cate, 2014), carrying out entrustable professional activities (Chen, van den Broek, & ten Cate, 2014; Englander & Carraccio, 2014; Teherani & Chen, 2014; Ten Cate, 2014a). Students form a professional identity through extended patient contact experiences that give them the ability to reason through medical problems while exploring their own feelings in a supportive environment (Konkin & Suddards, 2012). Clinical performance of graduates of LIC-based medical education programs have been found to perform as well as their peers trained in traditional rotation-based programs (Walters et al., 2012; Woloschuk, Myhre, Jackson, McLaughlin, & Wright, 2014). Research to date suggests that the advantages of training in a LIC extend into practice, especially in patient centred care and confidence in role (Gaufberg et al., 2014).

Clinicians serve as role models, as role modeling is seen as the optimal method of developing professionalism (Passi et al., 2013). This and a supportive environment, allowing students to assume some of the decision making and clinical aspects of the doctors role under supervised conditions ("acting up"), and treating medical students as junior colleagues, have demonstrated advantages in medical education (Benbassat, 2013), and thus produce junior doctors who are likely to fare better in developing their professional identity (Jarvis-Selinger, Pratt, & Regehr, 2012). Lack of this acting up component, which is sometimes provided as a pre-internship "PRINT" term (Scicluna, Grimm, Jones, Pilotto, & McNeil, 2014) or shadowing (Van Hamel & Jenner, 2014), in or immediately following the senior years of medical education, tends to produce interns who feel insecure in their decision-making, time management, and administrative skills (Kellett et al., 2014; Van Hamel & Jenner, 2014).

Internship is demanding and stressful (Willcock, Daly, Tennant, & Allard, 2004), and as a result, young doctors are prone to depression (Markwell & Wainer, 2009), burnout, lowered resilience (Cooke, Doust, & Steele, 2013), and even suicide (Jenkins, 2009). Mindfulness training can help alleviate stress by providing coping mechanisms (Barbosa et al., 2013; Bullock et al., 2013). Practice competence is a function both of the individual doctor's training and the organisational culture in which that doctor operates (Kilminster, Zukas, Quinton, & Roberts, 2011), and so no training program can expect to fully prepare a doctor to function well right from the start in a new setting at an advanced stage of knowledge.

There has been little recent research on preparation for practice in Australian medicine, but a study from Western Australia found that junior doctors were prepared well in areas of professionalism and interpersonal skills, but less so in clinical skills and ability to perform in emergencies (Carr, Celenza, & Lake, 2014).

We interviewed graduates from the first two cohorts of a medical education program that featured a 38 week longitudinal integrated clerkship as their Phase III (penultimate year) training to determine how well their training prepared them to be junior doctors, and what aspects of that training they thought were particularly useful. This clerkship (referred to as a

‘Phase three placement’ in the curriculum) consisted of a 2 day per week embedded placement in a General Practice, where, as students, they learned through parallel consulting (Walters, Worley, Prideaux, & Lange, 2008) in a competency based training program (Chacko, 2014; Hurtubise & Roman, 2014). Specialty placements were also undertaken for 2 days per week in a rural hospital or specialist clinic.

Figure 1. Values added by a Longitudinal Integrated Clerkship.

Figure 1 is a figurative representation of student progress through their rural LIC. Individual students progress at varying rates in the each stream. As students, they were supported in their development by their GP preceptor, who acted as supervisor and mentor for the 38 week period of the LIC, with hospital clinicians and university staff also shaping the learning environment. Clinicians are supported from both local and medical school- based university staff. As they built increasing confidence and competency, students were encouraged to take on more responsibility, developing a sense of professionalism and professional identity. Towards the end of their term they were able to “act up “to intern level. Their LIC was followed,

in this program, by elective and Pre-internship attachments. Community engagement and a focus on efforts to ensure sustainability have been essential to the success of this program (Hudson, Farmer, Weston, & Bushnell, 2015).

Methods

Conceptual framework

Participant selection

Convenience sampling was the primary selection method employed. Participants were recruited from graduates of a postgraduate medical program in NSW Australia who had experienced a longitudinal integrated clerkship in a rural practice setting as the penultimate year of their training. Initial recruitment was of students who had maintained correspondence with the lead investigators. As current contact details were not available for all students from this program, snowball sampling, whereby participants were requested to inform fellow graduates of the study and relay an invitation to participate, was used, to good effect.

No graduates who were contacted declined to participate. Participants received a participant information sheet and signed a consent form guaranteeing their anonymity prior to interview. Recruitment continued until the researchers considered that data saturation had been achieved.

Data collection

An in-depth interview script was developed by the research team, designed to guide participants in reviewing their reflections on the LIC phase of their medical school training and to reflect on which aspects of that training they considered helpful in preparing them for internship/residency and where they experienced gaps that might have been filled in that phase.

One or two of the investigators (HB, JB) conducted the interviews. When possible, interviews were conducted face to face. Where that could not be achieved, a telephone interview was carried out. The interview script is attached as Appendix 1.

Data analysis

Audio recordings of the interviews were transcribed verbatim by a professional transcriptionist. Transcripts were reviewed against the audio recordings for accuracy by one of the primary investigators (HB) and significant findings highlighted in the text by another (JB). Initial thematic analysis was performed by HB using N'Vivo version 9 (QSR International http://www.qsrinternational.com/products_nvivo.aspx), with coding and themes reviewed by the other investigators iteratively as analysis progressed. Inductive analysis (Thomas, 2006) was used to identify themes from interview data.

Ethics

The University of Sydney Human Research Ethics Committee (HREC) approved the study under protocol number 13006 originally issued 8 September 2010, renewed 14 Apr 2014. The University of Wollongong HREC issued a reciprocal approval, NSA12/015 in August 2012.

Results

Thirteen junior doctors were interviewed. **Table 1** summarises interview data. Aspects of the LIC that were useful included practice in documentation gained in GP, autonomy that was allowed while practicing in rural emergency departments, the ability to experience different modes of care provision that would be specialties in a metropolitan setting (obstetrics/gynaecology, paediatrics, mental health). Close relationship with preceptors, registrars, built confidence and enabled easier integration in teams during internship.

Table 1. Data collection.	
Interview ID and gender	Interview duration, minutes
1M	52:36
2F	30:26
3F	30:30
4F	25:00
5F	13:00
6M	40:00
7F	50:00
8M	10:00
9F	35:00
10F	41:42
11F	40:51
12M	27:59
13F	27:36
14M	29:36

The closeness and camaraderie shared with fellow students was also reported to enhance learning. During the placement, students were away from home and non-medical friends, and so ate, exercised, and studied together. They also reflected together on interesting experiences and presentations they had witnessed. They considered that this shared experience was very important in identity formation and skill building.

living with other medical students... was really good. We did quite a few study group sessions together... I remember them being really excellent learning, bouncing ideas off each other. Yeah I think it definitely enhanced our learning. (3F)

Thematic analysis of the interviews identified 8 main areas that the interviewees felt had contributed to the development of the clinical competency and confidence needed to make the transition to internship. Themes derived from data analysis are presented conceptually in **Figure 2**.

Participants are identified by gender and the code number assigned to the interview (i.e. 7F = interview 7, a female intern).

Figure 2. Development of physician competency through rural Longitudinal Integrated Clerkship.

1. Longitudinal relationships with clinicians, patients and peers

A major difference between participants' traditional hospital based rotations in the early years of their program and their experiences on their LIC placements was the longer term relationships they made with clinicians, patients and peers. Participants spoke of these relationships as supporting them to develop not only in their clinical competency, but in their professionalism and confidence. They described how together with their preceptors they identified their learning needs and that over time, through being encouraged to take increasing responsibility for patient care while feeling fully supported by their supervising clinicians, they built on their clinical skills.

Longitudinal relationships with patients were seen as beneficial in developing a deeper understanding of the development of a disease process and how that disease impacted on the patient physically and psychologically. This was helpful to them as interns and later in general practice. Patients treated them as though they were already doctors giving them insight into a doctor's role and into patient centred care increasing their sense of professionalism and professional identity

one of the best assets of the longitudinal placement is the ability to do parallel consulting...once my supervisors became aware of my skill level and my learning needs they allowed me to...examine and obtain histories from patients and start to initiate management plans, of course with their review, but it's that ability to go through that process on your own and independently which is where you really learn... So I think having that experience from day one of the placement and being able to work through diagnosis and problems on your own was really one of the biggest... benefits of that placement. (14M)

2. Developing Clinical Skills

Participants were conscious of their continuing progress in proficiency and in confidence;

phase three is very much independent learning which at first can be quite daunting, but what a lot of student don't realise and it's probably only in retrospect that you see this is that in order to develop into an independent worker, you need to learn independently and learn how to problem solve, learn how to find information for yourself. Learn how to be self reflective in your own practice. And so... in the beginning you flounder and you aren't entirely sure where you should be and what you should be doing. You know if you're in the way, but... By the end of the year you are working within a team, in the hospital and you understand how the systems work (7F)

Being at a school where I was taken to rural places, as a doctor now, and through medical students that I see come through and teaching them, I can really see the difference in the abilities of people who train rurally. And in that I'm saying that that I think that their clinical skills, communication skills, patient report is superior (2F)

They reported that they had many opportunities to be the first to see patients with undifferentiated disease and to develop their clinical reasoning and management skills. They also regularly saw the same common presentations they later saw as interns and became competent at managing them. Having mastered these skills as students reduced the stress of being interns.

by the time you get internship, you've honed a lot of those skills for particular presentations and the appropriate questions that you need to ask, and what not to miss.(7F)

They felt that both in General Practice and in the hospital being in a rural/regional centre facilitated closer relationships with clinicians and hospital and GP staff. Specialists (consultants) appear to be demystified by these participants in a rural LIC, with many of them reporting this as an important difference from both their own earlier metro placement experiences, and those reported by their peers who remained in a metro placement (generally traditional block placement).

3. Opportunities to develop procedural skills

Participants reported that they felt they had more opportunities to develop confidence and competency in their procedural skills (suturing, cannulation, catheterisation etc.) skills than they would have had in a classical metropolitan teaching setting.

I think it was really good in terms of the fact that you had a lot more responsibility with the patient...than you would have had maybe in a major teaching hospital. So you had the chance to really access a patient yourself, do a history, do an exam and come up with a management plan and then talk to the doctor about it. So I think you got a lot of practice in that regards. (13F)

I spent a lot of time in m emergency department and had a lot of independence there and I guess a lot more responsibility placed on us as student ha we possibly would have gotten elsewhere...(4F)

Communication Skills

Participants considered that they had more opportunity to develop their communication skills in a variety of different clinical situations through the parallel consultations that were integral to their clinical placements than they would have had in a traditional hospital based clerkship. This was due to the number of patients they saw on their own in parallel consulting, the time allocated to each patient, which allowed for deeper enquiry, and the longitudinal nature of their relationships with patients. Participants considered that they became better at communication skill both in communicating with patients...

you are spending a lot of time on your own talking to patients...and then need to present... your impression to your bosses. So you learn how to phrase questions and rephrase questions to find out the information that you need, and...when to use open questions and closed questions. And I think that's a skill that is definitely honed through Phase III (7F)

...and with fellow clinicians

the very useful thing in GP practice in phase three is you had the opportunity to present cases to your bosses every time you had a new patient, and you could hone those skills. (7F)

4. Increasing autonomy; 'Acting up'

Participants were able to see undifferentiated patients on their own as students. This encouraged them to know responsibility and care about their patients. One of the main benefits that participants ascribed to the rural component of their medical education was being given the opportunity to 'act up', performing a clinical role under supervision. In General Practice, this was realised through the parallel consulting frame of the placement. In hospital settings, the small staff size and familiarity of the staff with each other allowed a frame where students could take on ward roles usually carried out by an intern.

particularly in a rural hospital there were no interns, and so it kind of gave you the opportunity to step up into that role and be more part of a team with picking up patients and seeing patients more independently, than in a bigger setting.... the supervision was a lot more close in the smaller centres where you were able to see

patients on your own, yet ... your bosses knew who you were with, what you were doing and so you felt very supported at the same time (7F)

This is opposed to a hospital setting, where it is easier for the student to be relegated to a student observer role. Students also knew that they wouldn't see that patient again.

In general the two days we spent in the hospital...we were sort of almost acting like interns, just with limited scope (1M)

This was mixed with some understandable apprehension as well.

you felt a bit like you're a fraud in a sense because you are but you know, you're not... There's a fine line between...being given a lot of responsibility but given too much you feel good when you're given a lot of responsibility cause you think, wow, I'm becoming a doctor now and all of this. but you've got to...pull yourself back because if you're out there thinking that you're some great doctor when you're only a med student or just an intern and something really comes your way and you stuff up. Then that's it. Like you could've killed somebody...the supervisors need to be supervised. (11F)

Students said that they felt more confident as an intern as a result of their rural longitudinal placement.

being given the opportunity to have some autonomy is, early on is invaluable.(6M)

...the fact that people were allowing you to see these patients or do a hand over or write the discharge summary or make the odd phone call and things like that, makes you feel that, well, actually I'm probably doing it relatively well as well. So I think the support you get from the clinicians that you work with and the Registrars, if...obviously they must have some sort of confidence in you to be able to do those skills so I think that helps build your own confidence as well. (9F)

I felt more confident starting as an intern definitely. (12M)

5. Working in teams

The nature of their LIC, being embedded in General Practice and spending time in hospital settings, contributed to an ability to work in teams, as was required once they became qualified

when you're in a working environment you can't choose who you work with and so you just have to develop strategies in order to be able to cope with... I think that is really important to be able to be very adaptable to be working with different... I thought that was a really important learning point that I found up there and I would have to say that that was definitely a positive experience now. (10F)

Students valued their peer group relationships, many experiencing that living and working away from the distraction of their home environment the group became important for social support and for group learning. They felt this supported them to learn to work in a team as they needed to as interns

a lot of my patients were individuals that I would see for months and months and so I got...I had the opportunity to go through their clinical journey with them.(14M)

6. Knowledge of Health systems

Participants found that a significant proportion of their role as interns involved information transfer both between hospital clinicians on ward rounds or at hand over to general practitioners or allied health professionals through discharge summaries. Both in general

practice and in the hospital setting they felt they had become proficient at producing effective patient notes, having practiced patient handover regularly in all the clinical settings they worked in.

They developed a deeper understanding of the contribution of community based health care to the whole of health care, and the roles allied health workers play. This gave them a more global perspective on health and a deeper understanding of services available to patients once they are discharged. During their clerkship they also experienced how the hospital functioned and where to seek support and who to refer to. While not comprehensive, this appears to have prepared them for further learning

...when we were in GP you sort of had to really think about what you were going to write down in the patient file, because that was going to be there long term. So it gave you so of that responsibility of documenting accurately, which I think is a good thing to learn early on... because even now those skills that I used in that GP phase three such as... documenting all the relevant negatives and taking a really good social history... I definitely still use those skills now. (3F)

In particular they reported gaining the ability to write a discharge summary that met the GPs needs and promoted continuity of care.

...being in the GP setting in phase three has enabled me to write relevant discharge summaries back to the GP, giving clear instructions on you know what was suggested when the patient was discharged home. (10F)

...but not in hospital

I had to push to do some discharge summaries because a lot of people don't like to get the students to do it because it's such a horrible job and you'll have to do so many when you get into the job. That's the excuse I always heard ... I think people should be a bit more willing to get you to do those things but I guess in the end it comes down to them having to sign it after. If they're not comfortable then that's fair but yeah. I got to do a few but that was because I asked. (9F)

...and only for certain skills. Some participants felt they had inadequate experience charting medication charts and writing scripts which is not legal as students, but others had done this electronically and the clinician had supervised and signed them

... I didn't really feel it prepared me to write scripts.(12M)

I thought... the inter-professional learning session that was pretty good... It was a good way, I guess, of learning from other students... if you were learning in a bigger centre you probably wouldn't have that opportunity. You wouldn't be in contact with students from other disciplines as we were, and so... I got to learn what a social worker actually did. Or what an OT actually did, and what the boundaries of their jobs were, and their job description was...

7. Self Care Work/life balance

All participants expressed satisfaction with the balance they had achieved thus far, and some attributed that to their rural LIC experience...

I had previously been particularly bad at my work/life balance... And I actually came to understand the importance of that during phase three and since then I've been very thankful of it. (2F)

Although most found the life of a medical student was still less demanding than their present role as a doctor, and considered that work/life balance was something they were gaining at the present, PGY, stage of their career.

it wasn't until I started working that I really understood how to manage the work/life balance (3F)

8. Professionalism

All students considered that their rural LIC experience prepared them well for internship.

the model we had up in the North Coast, New South Wales was by far the best model. We had more opportunity to... do and see all areas of medicine that a lot of other students didn't actually get in the other areas... going into internship you felt very prepared to, from day one, to at least know how to start and where to find out information and who to ask questions. I think, yeah, there were no surprises going into internship after having completed phase three, so I think it is actually, in essence, prepared you very well.

Drawbacks

Participants realised there were gaps in their experience that still needed filling in

I think you need exposure to large tertiary sense of where you know you see situations and clinical scenarios and diseases that you just never would see in a rural setting because they can't handle them. They would always transfer those patients (7F)

Some participants experienced disadvantage in seeking metropolitan registrar positions by having spent so much of their early training in a rural setting.

Unfortunately it pays to have your face known to the professionals in Sydney. So for [two] of us, our feedback was that we were fantastic candidates, CV's were on line with the people that got the job, everything, except for the fact that we were here, and we hadn't had any city experience... from people that we know got jobs, a part of it is that the person who interviewed them knew them. And unfortunately that's really sad to say but in that way we got disadvantaged by not being in the city hospital (2F)

The short duration and continual transfer between hospital specialty rotations in the early years of the teaching program did not provide as rich a learning experience as the longitudinal GP placements did.

Being a part of a team is really important....you're not taken as seriously by the team, because you're there sporadically. If you're there consecutively, you've actually see what's happening to patients. You can see their journey. You need, I think continuity is really important. (2F)

The hospital for at least my year, look it was very sporadic. You were never in the one spot at the same time. It was two separate days a week... There was no continuity in Hospital experience...I didn't learn as much in hospital as I did in GP. (2F)

As their teaching program developed, hospital based specialty rotations were increased in length. Participants who completed their placement under the new scheme reported better preparation than did those who had shorter hospital rotations.

... we didn't really have sort of one week or two week rotations which I think really helped. If you're only there for one week, by the end of the first week you sort of just get the feel of it and have a bit of an idea of what you should be doing and how the ward runs and what the sort of flow of the day would be. But if you start hanging around for you know, two/three/four weeks, the longer you're there the more you can do and the more the [staff physicians] can see what you can do and they get a bit of an idea of what your, I guess level of knowledge is and what your level of...the skill level is as well. (9F)

Advantages of learning medicine in a rural environment.

The consensus view was that a rural placement was an excellent way to learn medicine, for a variety of reasons including relationships with clinicians, less competition for access to patients, opportunities to extend their clinical skills and act up to intern level in the absence of other junior staff. Their preceptors became not only their teachers but role models and friends-role modelling not only clinical skills but professionalism and work life balance.

These relationships meant they often experienced one on one teaching which changed their perception of senior clinicians being inaccessible, in a sense humanising them, so that as interns they felt confident to identify their own limitations and to request assistance if needed.

in a rural area you get more hands on clinical skills because it's less staff, and within the staff that you work with you get to know them very well... when you get to know people well they're more likely to... facilitate you having hands on experiences and so that is something that is very unique to a rural setting. (7F).

[learning in a rural setting] was 100% an advantage, yeah definitely, I think with working in a rural setting firstly you probably get more exposure and more responsibility as a student. There's a smaller group of people so you're then able to develop relationships faster...And so people get to know you faster and then possibly able to work out what your limitations are and also what you're willing to do. (10F)

my general experience was so positive, which is why I moved back here and chosen to do this as a career and I really enjoyed every day that I was at the practice. (14M)

Some noted this difference in medical students they were now supervising;

... as a doctor now, and through medical students that I see come through and teaching them, I can really see the difference in the abilities of people who train rurally. And in that I'm saying that that I think that their clinical skills, communication skills, patient report is superior.(2F)

I definitely think learning in a rural hospital has its advantages in the sense of you get to see different presentations and you get a lot more responsibility (4F)

Discussion

Our findings mirror those of our colleagues (Daly, Perkins, Kumar, Roberts, & Moore, 2013; Jamar, Newbury, & Mills, 2014; Walters et al., 2012) in that graduates of a program incorporating an LIC possess good communication and clinical skills, and are more ready for the role of a doctor, having gained clinical experience though 'acting up' that closely approximates this. Rural students gain confidence and procedural skill, perhaps to a greater extent than their metro-trained counterparts (Rowe, Campbell, & Hargrave, 2014).

Medical education situated in rural areas has started to produce graduates willing to do their internships there (Sen Gupta, Woolley, Murray, Hays, & McCloskey, 2014). While still based more on a tradition of apprenticeship than on codified theories of experiential learning (Yardley, Teunissen, & Dornan, 2012), rural training in smaller environments imparts high quality training and confidence in their professional selves (Eley, 2010; Roberts et al., 2012) and full membership in a community of practice (Daly, Roberts, et al., 2013) involving patients as well as health care practitioners and students (Hudson, Knight, & Weston, 2012). The theoretical framework is Lave & Wenger's situated learning with legitimate peripheral participation (Lave & Wenger, 1991; Wenger, 1998).

Participants in this study were graduates of a program that provided opportunity for them to actively engage in legitimate participation in providing care, rather than as mere observers or data collectors (Tolsgaard, Arendrup, Pedersen, & Ringsted, 2013). This supported participation in an immersive experience, while not without risk (ten Cate, 2014b), seems to have resulted in the development of both clinical competence and a confident professional identity as a doctor (Dornan, Boshuizen, King, & Scherpbier, 2007), with a sense of self-efficacy (confidence) and authenticity in the role realized as a result (Benbassat, 2013; Yeung, Li, Wilson, & Craven, 2014). Resilience-grit (Salles, Cohen, & Mueller, 2014) is a necessary survival attribute for postgraduate training, and seemed to be produced in these participants by their rural LIC experience.

In consort with Kolb's theory (Kolb, 1984), experience in settings where hierarchy between clinician and student was de-emphasized, along with guided decision making have been found to be conducive to preparation for clinical practice (Wiener-Ogilvie, Bennison, & Smith, 2014).

None of the participants in this study said that they felt overwhelmed by the additional responsibility, complexity, and variety of conditions they experienced while in their LIC. Our participants reported none of the serious deficiencies in practice skills or lack of confidence reported in other recent studies on the transition from medical student to intern (Cameron, Millar, Szmidt, Hanlon, & Cleland, 2014).

The advantages we found in these students training which prepared them well for internship were integral both to the longitudinal, unstructured placement, and to the fact that it was carried out in a rural area. The two aspects of these placements appear to act synergistically, reinforcing the learning experience. The rural community of health care workers was experienced to be more collegial, tightly knit, and working effectively across disciplines. As students stay longer they became known to their supervisors, who afforded them more independence, more opportunity to exercise initiative and responsibility. Knowing these students would be around for an entire year, supervisors were able to count on continuity of performance of these students in their roles. This active learning (Hurtubise & Roman, 2014) through supported participation (Dornan et al., 2007) in the actual practice of medicine was the key to success for our participants.

Limitations

As in all qualitative research, findings are those from the participants recruited, and may not be generalisable to all graduates of this program or other programs. The convenience and (particularly) snowball sampling processes may inject a bias into our findings

The overarching positivity of participants' views in interview could be a halo effect (Thorndike, 1920), as the participants were familiar with interviewers and were members of cohorts that had rated their training very favourably upon completion of the placement.

There is still no verified metric for outcomes of medical education in terms of performance in practice (Edwards, Wilkinson, Canny, Pearce, & Coates, 2014; Hamdy et al., 2006; Harfmann & Zirwas, 2011).

Conclusion

Participants in this research revealed that, far from merely focusing on acquiring knowledge and skills, the tasks they would be expected to do were integral to their training (ten Cate, 2014c), as was stepping into the identity they would assume (Frost & Regehr, 2013).

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References

- Barbosa, P., Raymond, G., Zlotnick, C., Wilk, J., Toomey III, R., & Mitchell III, J. (2013). Mindfulness-based stress reduction training is associated with greater empathy and reduced anxiety for graduate healthcare students. *Education for Health*, 26(1), 9.
- Benbassat, J. (2013). Undesirable features of the medical learning environment: a narrative review of the literature. *Advances in Health Sciences Education*, 18(3), 527-536.
- Birden, H. H., & Wilson, I. (2012). Rural placements are effective for teaching medicine in Australia: evaluation of a cohort of students studying in rural placements. *Rural and Remote Health* 12:2167. (Online) 2012. Available: <http://www.rrh.org.au>.
- Brennan, N., Corrigan, O., Allard, J., Archer, J., Barnes, R., Bleakley, A., . . . De Bere, S. R. (2010). The transition from medical student to junior doctor: today's experiences of Tomorrow's Doctors. *Medical Education*, 44(5), 449-458. doi: 10.1111/j.1365-2923.2009.03604.x
- Bullock, A., Fox, F., Barnes, R., Doran, N., Hardyman, W., Moss, D., & Stacey, M. (2013). Transitions in medicine: trainee doctor stress and support mechanisms. *Journal of Workplace Learning*, 25(6), 368-382. doi: doi:10.1108/JWL-Jul-2012-0052
- Cameron, A., Millar, J., Szmidt, N., Hanlon, K., & Cleland, J. (2014). Can new doctors be prepared for practice? A review. *The Clinical Teacher*, 11(3), 188-192.
- Carr, S. E., Celenza, T., & Lake, F. R. (2014). Descriptive analysis of junior doctor assessment in the first postgraduate year. *Medical Teacher*, 36(11), 983-990. doi: doi:10.3109/0142159X.2014.918255
- Chacko, T. V. (2014). Moving toward competency-based education: Challenges and the way forward. *Archives of Medicine and Health Sciences*, 2(2), 247.

- Chen, H. C., van den Broek, W., & ten Cate, O. (2014). The Case for Use of Entrustable Professional Activities in Undergraduate Medical Education. *Academic medicine: journal of the Association of American Medical Colleges*.
- Cooke, G. P., Doust, J. A., & Steele, M. C. (2013). A survey of resilience, burnout, and tolerance of uncertainty in Australian general practice registrars. *BMC Medical Education*, 13(1), 2.
- Couper, I., Worley, P., Strasser, R., & Strasser, I. (2011). Rural longitudinal integrated clerkships: lessons from two programs on different continents. *Rural and Remote Health* 11: 1665. (Online) 2011. Available: <http://www.rrh.org.au>.
- Daly, M., Perkins, D., Kumar, K., Roberts, C., & Moore, M. (2013). What factors in rural and remote extended clinical placements may contribute to preparedness for practice, from the perspective of students and clinicians? *Medical Teacher*, 35(11), 900-907. doi: 10.3109/0142159X.2013.820274
- Daly, M., Roberts, C., Kumar, K., & Perkins, D. (2013). Longitudinal integrated rural placements: a social learning systems perspective. *Medical Education*, 47(4), 352-361.
- Dornan, T., Boshuizen, H., King, N., & Scherpbier, A. (2007). Experience-based learning: a model linking the processes and outcomes of medical students' workplace learning. *Medical Education*, 41(1), 84-91.
- Edwards, D., Wilkinson, D., Canny, B. J., Pearce, J., & Coates, H. (2014). Developing outcomes assessments for collaborative, cross-institutional benchmarking: Progress of the Australian Medical Assessment Collaboration. *Medical Teacher*, 36(2), 139-147.
- Eley, D. (2010). Postgraduates' perceptions of preparedness for work as a doctor and making future career decisions: support for rural, non-traditional medical schools. *Education for Health*, 23(2), 374.
- Englander, R. M. D. M. P. H., & Carraccio, C. M. D. M. (2014). From Theory to Practice: Making Entrustable Professional Activities Come to Life in the Context of Milestones. *Academic Medicine*, 89(10), 1321-1323.
- Frost, H. D. P., & Regehr, G. P. (2013). "I AM a Doctor": Negotiating the Discourses of Standardization and Diversity in Professional Identity Construction. *Academic Medicine*, 88(10), 1570-1577.
- Gaufberg, E., Hirsh, D., Krupat, E., Ogur, B., Pelletier, S., Reiff, D., & Bor, D. (2014). Into the future: patient-centredness endures in longitudinal integrated clerkship graduates. *Medical Education*, 48(6), 572-582.
- Hamdy, H., Prasad, K., Anderson, M. B., Scherpbier, A., Williams, R., Zwierstra, R., & Cuddihy, H. (2006). BEME Guide Number 5; BEME systematic review: Predictive values of measurements obtained in medical schools and future performance in medical practice. *Medical Teacher*, 28(2), 103-116.
- Harfmann, K. L., & Zirwas, M. J. (2011). Can performance in medical school predict performance in residency? A compilation and review of correlative studies. *Journal of the American Academy of Dermatology*, 65(5), 1010-1022. e1012.
- Hirsh, D. A., Holmboe, E. S., & ten Cate, O. (2014). Time to Trust: Longitudinal Integrated Clerkships and Entrustable Professional Activities. *Academic Medicine, Publish Ahead of Print*, 10.1097/ACM.000000000000111.

- Hudson, J. N., Farmer, E. A., Weston, K. M., & Bushnell, J. A. (2015). Using a framework to implement large-scale innovation in medical education with the intent of achieving sustainability. *BMC Medical Education*(1), 2.
- Hudson, J. N., Knight, P. J., & Weston, K. M. (2012). Patient perceptions of innovative longitudinal integrated clerkships based in regional, rural and remote primary care: a qualitative study. *BMC Family Practice*, 13(1), 72.
- Hurtubise, L., & Roman, B. (2014). Competency-based curricular design to encourage significant learning. *Current Problems in Pediatric & Adolescent Health Care*, 44(6), 164-169.
- Jamar, E., Newbury, J., & Mills, D. (2014). Early career location of University of Adelaide rural cohort medical students. *Rural and Remote Health* 14: 2592. (Online) 2014. Available: <http://www.rrh.org.au>.
- Jarvis-Selinger, S., Pratt, D. D., & Regehr, G. (2012). Competency Is Not Enough: Integrating Identity Formation Into the Medical Education Discourse *Academic Medicine*, 87(9), 1185-1190.
- Jenkins, K. D. (2009). Keeping the doctor healthy: ongoing challenges. *Medical Journal of Australia*, 191(8), 435.
- Kellett, J., Papageorgiou, A., Cavenagh, P., Salter, C., Miles, S., & Leinster, S. J. (2014). The preparedness of newly qualified doctors – Views of Foundation doctors and supervisors. *Medical Teacher*, ahead of print(0), 1-6. doi: doi:10.3109/0142159X.2014.970619
- Kilminster, S., Zukas, M., Quinton, N., & Roberts, T. (2011). Preparedness is not enough: understanding transitions as critically intensive learning periods. *Medical Education*, 45(10), 1006-1015.
- Kolb, D. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall.
- Konkin, J., & Suddards, C. (2012). Creating stories to live by: caring and professional identity formation in a longitudinal integrated clerkship. *Advances in Health Sciences Education*, 1-12.
- Latessa, R., Beaty, N., Royal, K., Colvin, G., Pathman, D. E., & Heck, J. (2015). Academic outcomes of a community-based longitudinal integrated clerkships program. *Medical Teacher*(0), 1-6.
- Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral participation*. NY: Cambridge University Press.
- Markwell, A. L., & Wainer, Z. (2009). The health and wellbeing of junior doctors: insights from a national survey. *Medical Journal of Australia*, 191(8), 441.
- Norris, T. E., Schaad, D. C., DeWitt, D., Ogur, B., & Hunt, D. D. (2009). Longitudinal integrated clerkships for medical students: An innovation adopted by medical schools in Australia, Canada, South Africa, and the United States. *Academic Medicine*, 84(7), 902.
- Passi, V., Johnson, S., Peile, E., Wright, S., Hafferty, F., & Johnson, N. (2013). Doctor role modelling in medical education: BEME Guide No. 27. *Medical Teacher*(0), e1-e15.
- Roberts, C., Daly, M., Kumar, K., Perkins, D., Richards, D., & Garne, D. (2012). A longitudinal integrated placement and medical students' intentions to practise rurally. *Medical Education*, 46(2), 179-191. doi: 10.1111/j.1365-2923.2011.04102.x

- Rowe, C. J., Campbell, I. S., & Hargrave, L. A. (2014). Rural experience for junior doctors: Is it time to make it mandatory? *Australian Journal of Rural Health*, 22(2), 63-67. doi: 10.1111/ajr.12082
- Salles, A., Cohen, G. L., & Mueller, C. M. (2014). The relationship between grit and resident well-being. *The American Journal of Surgery*, 207(2), 251-254.
- Scicluna, H. A., Grimm, M. C., Jones, P. D., Pilotto, L. S., & McNeil, H. P. (2014). Improving the transition from medical school to internship-evaluation of a preparation for internship course. *BMC Medical Education*, 14(1), 23.
- Sen Gupta, T., Woolley, T., Murray, R., Hays, R., & McCloskey, T. (2014). Positive impacts on rural and regional workforce from the first seven cohorts of James Cook University medical graduates. *Rural and Remote Health*, 14(2657).
- Teherani, A., & Chen, H. C. (2014). The Next Steps in Competency-Based Medical Education: Milestones, Entrustable Professional Activities and Observable Practice Activities. *Journal of General Internal Medicine*, 29(8), 1090-1092.
- Ten Cate, O. (2014a). AM last page: what entrustable professional activities add to a competency-based curriculum. *Academic Medicine*, 89(4), 691.
- ten Cate, O. (2014b). Trusting graduates to enter residency: what does it take? *Journal of Graduate Medical Education*, 6(1), 7-10.
- ten Cate, O. (2014c). What Is a 21st-Century Doctor? Rethinking the Significance of the Medical Degree. *Academic Medicine*, 89(7), 966-969.
- Thomas, D. R. (2006). A General Inductive Approach for Analyzing Qualitative Evaluation Data. *American Journal of Evaluation*, 27(2), 237-246. doi: 10.1177/1098214005283748
- Thorndike, E. L. (1920). A constant error in psychological ratings. *Journal of Applied Psychology*, 4(1), 25-29.
- Tolsgaard, M. G., Arendrup, H., Pedersen, P., & Ringsted, C. (2013). Feasibility of self-directed learning in clerkships. *Medical Teacher*, 35(8), e1409-e1415. doi: doi:10.3109/0142159X.2013.770135
- Van Hamel, C., & Jenner, L. E. (2014). Prepared for practice? A national survey of UK foundation doctors and their supervisors. *Medical Teacher*, ahead of print(0), 1-8. doi: doi:10.3109/0142159X.2014.947929
- Van Schalkwyk, S. C., Bezuidenhout, J., & De Villiers, M. R. (2015). Understanding rural clinical learning spaces: Being and becoming a doctor. *Medical Teacher*, 0(0), 1-6. doi: doi:10.3109/0142159X.2014.956064
- Walters, L., Greenhill, J., Richards, J., Ward, H., Campbell, N., Ash, J., & Schuwirth, L. W. T. (2012). Outcomes of longitudinal integrated clinical placements for students, clinicians and society. *Medical Education*, 46(11), 1028-1041. doi: 10.1111/j.1365-2923.2012.04331.x
- Walters, L., Prideaux, D., Worley, P., & Greenhill, J. (2011). Demonstrating the value of longitudinal integrated placements to general practice preceptors. *Medical Education*, 45(5), 455-463. doi: <http://dx.doi.org/10.1111/j.1365-2923.2010.03901.x>
- Walters, L., Worley, P., Prideaux, D., & Lange, K. (2008). Do consultations in rural general practice take more time when practitioners are precepting medical students? *Medical Education*, 42(1), 69-73. doi: doi:10.1111/j.1365-2923.2007.02949.x

- Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity*. New York: Cambridge University Press.
- Wiener-Ogilvie, S., Bennison, J., & Smith, V. (2014). General practice training environment and its impact on preparedness. *Education for Primary Care, 25*(1), 8-17.
- Willcock, S., Daly, M., Tennant, C., & Allard, B. (2004). Burnout and psychiatric morbidity in new medical graduates. *Med J Aust, 181*(7), 357-360.
- Woloschuk, W., Myhre, D., Jackson, W., McLaughlin, K., & Wright, B. (2014). Comparing the Performance in Family Medicine Residencies of Graduates From Longitudinal Integrated Clerkships and Rotation-Based Clerkships. *Academic Medicine, Publish Ahead of Print*, 10.1097/ACM.000000000000113.
- Yardley, S., Teunissen, P. W., & Dornan, T. (2012). Experiential learning: AMEE Guide No. 63. *Medical Teacher, 34*(2), 102-115.
- Yeung, A. S., Li, B., Wilson, I., & Craven, R. G. (2014). The role of self-concept in medical education. *Journal of Further and Higher Education*(ahead-of-print), 1-19.