

## ORIGINAL RESEARCH

# Rural longitudinal integrated clerkships: lessons from two programs on different continents

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## ABSTRACT

**Introduction:** Flinders University in Australia has had a rural longitudinal integrated clerkship for selected medical students, the Parallel Rural Community Curriculum, since 1997. The Northern Ontario School of Medicine (NOSM) in Canada introduced a similar clerkship for all NOSM students in 2007. An external evaluation of both programs was conducted in 2006 and 2008, respectively. The aim of this article was to analyse the similarities in and differences between these two rural programs and determine key factors that could inform others interested in creating similar programs.

**Methods:** The evaluation took the form of a cross-sectional descriptive study conducted in each school using focus group and individual interviews, involving students, faculty, preceptors, health service managers and community representatives. Interviews were analysed for emerging themes based on a grounded theory approach, and common themes were tabulated and validated. The themes for the two sites were compared and contrasted to assess similarities and differences.

**Results:** Individual interviews were conducted with 87 people at Flinders and 39 at NOSM; focus groups included 45 students at Flinders and 7 at NOSM. All participants felt that the programs produce confident and skilled students. The educational value of the programs was expressed in terms of continuity of care, longitudinal exposure, development of relationships, mentoring, team work, and participatory learning. Common concerns related to issues of standardisation, ensuring exposure to all specialist disciplines, communication, support for students and preceptors, isolation, dealing with personal issues, and the process of site selection.



**Conclusions:** The rural longitudinal integrated clerkship approach to teaching the core clinical components of the undergraduate medical curriculum has a positive impact on both students and clinicians, as demonstrated in two different sites on two continents. Five key factors emerged that may inform development of similar programs in other institutions: (1) invest in careful site selection matching local epidemiology with curricular goals; (2) create collegiate faculty development that facilitates peer to peer relationships between rural and urban faculty; (3) integrate IT systems with the health system to create hardware synergies; (4) manage student expectations regarding isolation and expected site differences; and (5) build strong local postgraduate training that reinforces the values and workforce benefits of the undergraduate program.

**Key words:** integration, longitudinal clerkships, medical curriculum, medical education, program evaluation, rural training, undergraduate.

## Introduction

With the dual imperatives of improving medical student training and meeting rural health workforce needs, innovative rural medical educational solutions are being tested throughout the world. Examples include rural tracks which began in the USA in the 1970s<sup>1</sup> and rural clinical schools in Australia since 2000<sup>2</sup>. Such programs epitomise the recommendations of recent major reports: *Educating Physicians: a Call for Reform of Medical School and Residency* called for standardized learning outcomes combined with an individualized learning process and the promotion of multiple forms of integration<sup>3</sup>, and *Health Professionals for a New Century* argued for the importance of environment in clinical training, for the seamless integration of primary healthcare training into the academic system and for greater community engagement<sup>4</sup>.

In 1972, the University of Minnesota began the Rural Physicians Associates Program<sup>1</sup> which involves small numbers of students living and learning in the same rural community and practice for the majority of their principal clinical year. These students were recently demonstrated to perform at an equivalent level to their urban counterparts<sup>5</sup>. Other similar rural clerkships began in the 1990s, including the Parallel Rural Community Curriculum (PRCC) at Flinders University in South Australia<sup>6</sup>. These clerkships have become known as longitudinal integrated clerkships due to their aim to facilitate student contact with individual

patients over a number of different clinical encounters (longitudinal) and the way that they enable students to learn multiple specialist disciplines concurrently (integration)<sup>7</sup>. More recently, urban community and hospital based longitudinal clerkships have been introduced in the UK and USA, including the Cambridge Integrated Clerkship (CIC) associated with Harvard Medical School<sup>8</sup>. The Northern Ontario School of Medicine (NOSM) in Canada is the first medical school worldwide in which all students undertake a rural based longitudinal integrated clerkship known as the Comprehensive Community Clerkship (CCC)<sup>9</sup>.

Many medical schools have expressed interest in utilising this approach, particularly those working in rural and other low resource settings, and increasing numbers are experimenting with longitudinal clerkships<sup>7</sup>. Previous studies have indicated that such teaching can be sustained economically in private settings<sup>10</sup> and that students in these programs, compared with their peers undertaking training in teaching hospital rotations, have improved academic results<sup>11</sup>, less attrition of the social orientation that medical students typically exhibit on entry<sup>12</sup>, better exposure to common conditions<sup>13</sup>, more meaningful learning relationships with patients and academic mentors<sup>14</sup> and, for students who undertake rural programs, a greater uptake of primary care specialties and increased likelihood of subsequent practice in a rural community<sup>15,16</sup>.

In 2006, an external evaluation was undertaken of the Flinders PRCC (its third such evaluation), within the context



of the entire Year 3 program, for the purposes of quality assurance and providing a report to the funders<sup>17</sup>. In 2008 the same evaluator [IC] completed an evaluation of the NOSM CCC, conducted after the first group of students had completed their year at the rural sites<sup>18</sup>.

This article uses the themes identified in the original data of these two evaluations, with the purpose of addressing two questions:

1. What similarities and what differences exist in the evaluations of two similar programs at different stages of their evolution and conducted in different continents?
2. What key factors can be identified that may inform others interested in implementing longitudinal integrated curricula in rural communities?

## Context

In 1997 Flinders University in South Australia implemented a pilot program, based on the principle of continuity, in which medical students spend their entire third year of a four-year graduate entry medical program in rural family medicine sites, linked to district hospitals, undertaking a single integrated clerkship known as the PRCC<sup>6</sup>. This clerkship enabled the students to meet all their curricular requirements for surgery, internal medicine, obstetrics and gynaecology, paediatrics, psychiatry and family medicine. Their Year 3 peers undertook a standard series of discipline-specific rotations in an academic tertiary hospital. The success of this pilot<sup>11</sup> led to the scaling up of the PRCC program at Flinders University to a total of 6 regions involving 40% of its 140 students in each class. These regions are spread across a distance of 3500 km from the north to the south of the driest continent on earth. In Year 4, all students choose from a wide variety of shorter clerkships in both hospital and ambulatory settings.

The Northern Ontario School of Medicine (NOSM) commenced its MD program in 2005<sup>9</sup>. The NOSM serves as the Faculty of Medicine of Lakehead University in Thunder Bay and of Laurentian University in Sudbury. As the first

new medical school in Canada in over 30 years, NOSM introduced an innovative four-year curriculum, delivered concurrently at the two university campuses 1000 km apart and in many health service facilities located in the often sub-arctic climate of Northern Ontario. Drawing on the experience of the PRCC at Flinders, all students are required to spend their third year undertaking the CCC while living and learning in one of 12 large rural or small urban communities spread across the entire region. Students apply to NOSM knowing this is a requirement of the curriculum. The students return to Sudbury and Thunder Bay in Year 4 to undertake a series of hospital based clerkships.

Further detailed information about these programs can be found in an article by Worley et al<sup>6</sup> for the PRCC and a book by Tesson et al<sup>9</sup> for the CCC.

## Methods

The study used a phenomenological perspective with participants' reports of their own lived experiences serving as the principal data sources. A cross-sectional descriptive design using focus group and individual interviews for data collection was followed in both schools. Interviews were conducted with faculty, preceptors, administrators, health service managers and community representatives. Focus group discussions were held with groups of students who had completed the program in both institutions. In addition, due to the additional time available at Flinders, students who were still undergoing the program were also included in the Flinders data. A similar opening question was posed in all interviews, namely 'What is your experience of the PRCC/CCC?', with follow-up questions which specifically asked about educational and social advantages and disadvantages of the program, and recommendations for change.

Data collection took place at Flinders in July–August 2006, during which all PRCC sites were visited; all interviews were conducted face-to-face. Transcripts of interviews were provided to interviewees who requested these for checking. At NOSM, data collection took place over 1 week in June 2008, with many of the interviews being conducted



by tele- or video-conference. The focus group discussions were all personally facilitated by the evaluator [IC].

At each school, interviews were analysed for emerging themes by IC. No prior conceptual framework was used in this analysis. Themes were tabulated and validated through cross-checking by the focus group and interview subjects. In both cases, a draft report was submitted by the evaluator [IC] to the stakeholders [PW and RS] for input and comment prior to finalisation of the reports. IC was an independent evaluator who has experience of developing a smaller integrated rural clerkship in South Africa; PW is the Dean of Medicine at Flinders University and was involved in the conceptualisation of the PRCC; and RS is the Dean of Northern Ontario School of Medicine who was involved in the conceptualisation of the CCC.

For this secondary analysis, the reported themes for the two sites were compared and contrasted by all three authors to assess similarities and differences and to identify helpful lessons for others developing similar clerkships.

The research protocol was approved by the Human Research Ethics Committee of the University of the Witwatersrand.

## Results

At Flinders, individual interviews were conducted with 87 people, including university-based academic staff, clinicians and site coordinators, managers, academic support staff, and community and local government representatives. A total of 45 students participated in focus group discussions. At NOSM, interviews were conducted with 39 people, including faculty members, site liaison clinicians, other preceptors, site administrative co-ordinators, and health service managers. Two focus group discussions with 7 students in total were conducted. The more limited numbers of participants at NOSM was due to time constraints for conducting this evaluation. The major themes for each site are presented (Table 1).

### *Overall perspectives*

The key message from both programs is that the rural longitudinal integrated clerkships work. Students come back confident and skilled; at Flinders, they are favourably compared with the urban tertiary hospital trained students in Adelaide<sup>11</sup>, while at NOSM, being a new program, the Year 4 supervisors rate them highly in comparison with students from other medical schools.

The major common themes between the schools were the strongly positive feelings about the program from virtually all people interviewed, and the expressed educational value of the program in terms of continuity of care, longitudinal exposure, development of relationships, mentoring, team work, and participatory learning. The workforce issue – recruitment and retention – is also significant. Common concerns relate to issues of standardisation, ensuring exposure to all specialist disciplines, communication, support for students and preceptors, isolation, dealing with personal issues, and the process of site selection.

Some major themes were unique to each institution. In particular, the Flinders concept of many pathways leading to one common set of outcomes is a philosophy that is embedded in that school and was highlighted repeatedly as a positive aspect, in urban and rural sites.

### *Importance of continuity*

It is clear that, through the continuity of relationship and graded responsibility for patient care over an extended period of time, students develop both a well-rounded clinical competence in relation to common health problems together with practical procedural skills, and a broad set of skills related to team work, psychosocial understanding, awareness of context and community, problem-solving, and professional development. Thus students acquire important values through the process of their education. The impact on students of continuity of care alone is a major benefit; students see and learn about the whole life cycle of health and disease, rather than learning around the acute events and, often, highly complex diseases that characterise tertiary teaching hospitals.



**Table 1: Major themes identified in the evaluations of the Flinders Parallel Rural Community Curriculum and the Northern Ontario School of Medicine Comprehensive Community Clerkship**

<b>Major themes</b>	
<b>Flinders University</b>	<b>Northern Ontario School of Medicine</b>
<b>Overall</b>	
<ul style="list-style-type: none"> <li>• Students very positive</li> <li>• Many roads leading to one destination is a helpful educational approach for students and faculty</li> <li>• Common vision unifying service and education</li> <li>• Faculty as a whole are proud of what the PRCC is achieving</li> <li>• Academic success of the program creates the risk that students choose it for academic rather than vocational reasons</li> <li>• Lack of rural postgraduate training opportunities is a risk to the workforce agenda</li> </ul>	<ul style="list-style-type: none"> <li>• Overall positive experience</li> <li>• Engaged participatory learning</li> <li>• Better than expected for all concerned</li> <li>• The model does not suit everyone</li> <li>• Great variety and extent of clinical exposure</li> </ul>
<b>Continuity important because:</b>	
<ul style="list-style-type: none"> <li>• Relationships developed over time</li> <li>• Students become an asset to practices</li> <li>• Facilitates mentoring</li> <li>• Enables integration</li> <li>• Responsibility for patient care</li> <li>• Provides comprehensiveness</li> <li>• Facilitates continuity with patients and teachers</li> </ul>	<ul style="list-style-type: none"> <li>• See growth and maturation of students over the year</li> <li>• Ongoing longitudinal exposure to patients</li> <li>• Mentoring relationships develop between preceptors and students</li> <li>• Students see and participate in continuity of care</li> <li>• Students given graded responsibility</li> <li>• Clinical competence develops</li> </ul>
<b>Health service impact</b>	
<ul style="list-style-type: none"> <li>• Balance needed between the service load and teaching</li> <li>• Education and workforce goals both important</li> <li>• Stimulation of general practitioners</li> <li>• Need for teacher training, support and orientation</li> <li>• Patients enjoy students</li> <li>• Hospitals highly appreciative</li> <li>• Created a learning culture in the health service</li> <li>• Future workforce for health service</li> <li>• Workforce results need to be delivered</li> <li>• Positive impact on retention evident already</li> <li>• Seen as improving attitudes towards rural practice</li> </ul>	<ul style="list-style-type: none"> <li>• Clinicians found having students in their practices very stimulating</li> <li>• Seen as positive for local recruitment and retention</li> <li>• Students contribute to and motivate the medical team and the broader healthcare team</li> <li>• Supervising doctors found the annual Faculty development retreat very helpful</li> <li>• Physical resource constraints evident</li> <li>• Human resource constraints evident</li> </ul>
<b>Programmatic issues</b>	
<ul style="list-style-type: none"> <li>• Lack of standardisation seen as both a positive and negative: outcomes versus approaches, autonomy versus conformity</li> <li>• A different learning process required</li> <li>• Team work valued by students</li> <li>• Gaps in paediatrics and psychiatry at some sites</li> <li>• Students miss specialist contact</li> <li>• Dealing with problematic students has special difficulties</li> <li>• Student assessment – some disjuncture evident between clinical practice and assessment requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Exposure to rural family practice and primary care good</li> <li>• Objectives-based curriculum</li> <li>• Wanted more exposure to specialties</li> <li>• Students and preceptors felt there was a lack of flexibility in the student program</li> <li>• Lack of standardisation of teaching input and quality</li> <li>• Student assessment – some disjuncture evident between clinical practice and assessment requirements</li> <li>• Students were felt to be too busy at times to learn what they needed to</li> <li>• Lack of forward planning</li> <li>• Students well prepared to cope with CCC</li> </ul>



Table 1: cont'd

Major themes	
Flinders University	Northern Ontario School of Medicine
<b>Student and preceptor support</b>	
<ul style="list-style-type: none"> <li>• Student isolation is significant</li> <li>• Students need support (academic and social)</li> <li>• Some students need orientation to life in a small community</li> </ul>	<ul style="list-style-type: none"> <li>• Relationships with significant others still important and difficult to manage</li> <li>• Community involvement helpful</li> <li>• Isolation and personal problems require clear management</li> <li>• Social disruption a concern for some students</li> <li>• Financial burden for some students</li> </ul>
<b>Site selection</b>	
<ul style="list-style-type: none"> <li>• Variations occurred among practices, which could be positive or negative</li> <li>• All sites have their strengths and weaknesses</li> <li>• The grass is always greener somewhere else</li> <li>• Appreciation of diversity</li> <li>• Different sites suited to different students</li> <li>• Need for transparency in the selection process</li> <li>• Students would choose same site again</li> </ul>	<ul style="list-style-type: none"> <li>• Variability between sites, which could be positive or negative</li> <li>• Need flexible approach to accommodate this variability</li> <li>• Site selection process crucial - matching students to sites</li> </ul>
<b>Overcoming distance</b>	
<ul style="list-style-type: none"> <li>• Communication problems evident</li> <li>• Road safety a concern</li> <li>• Distance from resources an issue for some (eg the library)</li> </ul>	<ul style="list-style-type: none"> <li>• Communication problems evident</li> <li>• Technology not adequate yet</li> <li>• Problems evident with Virtual Academic Rounds</li> </ul>

CCC, Comprehensive Community Clerkship; PRCC, Parallel Rural Community Curriculum.

Mentoring is the key to both programs. In many ways the longitudinal integrated clerkship represents a return to apprenticeship-based training, combined with consistent standards and defined outcomes to ensure it is not idiosyncratic. Mentoring means that there is a faculty member/preceptor who takes interest in the progress, growth and maturation of each individual student over the entire year. This is difficult to match in tertiary teaching hospital settings – to the extent that students at the Flinders Medical Centre in Adelaide even complained of being neglected. It could be argued, as one of the tertiary academics at Flinders did, that where there is a choice, rather than only being suitable to stronger students, weaker students may be the ones who would benefit most from such input.

The role models provided by local family physician preceptors influence students' understanding far beyond clinical medicine to impact on their understanding of professionalism, responsibility, team work, living in a small community, doctor-patient relationships etc. It is in this

feature that the rurality of these programs probably has the greatest impact.

This mentoring relationship is not a one way street. For both PRCC and CCC, the preceptors were enthusiastic about the extent to which involvement in teaching stimulates them and, in many instances, this has rejuvenated their practice and rekindled their interest in medicine. This has important spin-offs for recruitment and retention of staff in rural areas.

### *Health service impact*

The workforce imperative is clear. The tension between the need to develop an appropriate health professional and the need for sound education must be held in balance. The buy-in from health service partners relates to both; they can see the value of developing a learning culture, but also have a vested interest in ensuring students return as graduates. It is arguable whether a year-long continuity clerkship would be supported by practitioners in small rural regions without this



hope of some of the students returning to practice there in the future.

The 'workforce versus education' tension was strong at Flinders. Because the program had been established for 10 years, the pressure on the PRCC to deliver on the workforce imperative was high and there were early signs of success, confirmed by subsequent research<sup>15</sup>. Curriculum issues were also high on the agenda of interviewees at all Flinders sites; NOSM was presumably still in the honeymoon phase of a new curriculum, so that mainly curriculum delivery issues were mentioned.

### ***Programmatic issues***

A new program will always face many challenges. Even at Flinders, as new sites are added there are new issues that arise. At the time of the evaluation, a new region had been recently added to the program, and issues such as resources, academic requirements, the insecurity of teachers and students, and the need for reassurance were evident there, as was the case in NOSM.

At NOSM, faculty reported that there is an objectives-based curriculum that provides the framework for the program. At Flinders, students and many faculty expressed the need for a clearer guide to the contents that must be covered during Year 3, including the PRCC.

Concerns around forward career planning were raised at NOSM, and not at Flinders, except in one new PRCC region; the newness of the program is the common factor. Also at NOSM, the issue of residency selection was important. Students and other respondents raised a concern about having to make career choices without having had separate exposures to all specialities.

### ***Student and preceptor support***

Support for students, both in terms of academic input, especially where they see they are 'missing out' on specific issues, and in terms of social support, given their sense of

isolation, is important. Many of the preceptors feel no less isolated and easily develop a 'them-and-us' attitude towards the teaching-hospital faculty. Efforts towards drawing the rural practitioners into the broader faculty, for example through annual retreats, involvement in student examinations and regular visits from faculty members, were reported as very worthwhile in addressing the sense of isolation.

Social isolation is dealt with at Flinders to some extent by weekly face-to-face meetings of students. Although this was not seen as enough by the students, it was certainly better than the weekly videoconference for students at NOSM. Face-to-face contact is obviously important to students, as a way of measuring their progress apart from any social reasons. Distances mean it requires effort to achieve this connectedness.

### ***Site selection***

Site selection was raised as an important issue in both programs, with concerns about the process being voiced. Whereas students at Flinders voluntarily select the PRCC, all students are required to do the CCC at NOSM. The argument in the latter case is that the selection was made when students chose to apply to NOSM. However, it was felt that ensuring the process of allocation is transparent and just should deal with most major concerns. Differing needs of students must also be taken into account and measures put in place to address these.

At Flinders, the different learning styles required for such a program and the fact that it may not suit everyone was an important positive theme; the Flinders program has the flexibility of choice. This was also raised at NOSM but more as an issue of concern because there is not the range of options available.

### ***Overcoming distance***

Communication is a major factor. It seems there can never be enough communication with students, preceptors and administrators at distant sites. Whereas each school feels it is



doing as much as it can, those at sites away from the main university campus, however, much as they may enjoy relative independence, still feel it is not enough. In both schools there was a big gap between what the faculty thought they had done for preceptors and what the preceptors reported had been done. This needs constant work.

The NOSM relies heavily on internet communication technology to deliver its program (in contrast to Flinders which abandoned such attempts early on), and students, preceptors and administrators alike raised many criticisms of this. Human, physical and financial resources were also raised only at NOSM, perhaps reflecting the newness of the program and anxiety about the sustainability of the CCC after 1 year.

## Discussion

This is the first article to compare evaluation outcomes from rural longitudinal integrated clerkships conducted on two different continents. The evaluation data were collected and analysed by the same researcher using similar research protocols, giving support to any similarities and differences in the themes being real.

The interviews at Flinders were predominantly face to face, whilst the NOSM evaluation required an increased use of tele- and video-conferencing. It is not known if the use of these technologies may have affected the data collected; however, it is known that those interviewed in this way were very much used to this technology because it is used extensively at NOSM for course delivery and management. The Flinders data were collected over 2 months as part of a visiting scholar appointment, whereas the NOSM data were collected over a concentrated one-week period due to the more limited availability of the evaluator over the period required. Despite the more limited number of interviews in this second evaluation, the subjects were purposely selected to ensure comprehensive coverage of relevant participants, and analysis of the data revealed saturation had occurred in both the Flinders and NOSM evaluations.

The fact that both evaluations were overwhelmingly positive is important but also carries risks. There is a continuing need to undertake quality assurance and to improve on what is being offered to students. Both programs have significant problematic issues that were raised in the evaluations, which need to be addressed, and which can provide an indicator to other programs of the sorts of issues that may be faced.

Site selection was a critical issue for both programs. It must be recognised, and carefully explained to students, that sites will be different. Students and faculty need the reassurance that variation is acceptable, even desirable, as long as there are commonly agreed outcomes – the many roads leading to one destination concept. What is critical is that sites are given the flexibility to make arrangements that are appropriate to their context, without being dictated to by central faculty. In other words, there needs to be a guiding framework, and core curriculum outcomes, with each site running a program that is appropriate to their situation.

At the same time, it must be recognised that some sites or practices will simply not be functional for a range of reasons from changing personnel, to relationships, and the practicalities of accommodation and transport. Urgent faculty intervention may be needed, and sometimes the decision must be made not to use such sites. Where it is seen as prestigious as well as advantageous to the practice to have students, as was the case in both areas in this study, finding alternative sites should present less of a problem, and affected practices will work hard to be reincluded. Both programs reported approaches from additional practices and family physicians to be included. Constant vigilance is required because a practice that works well can change in a matter of weeks when key staff members leave.

The persistence in the Flinders program of the same issues identified at NOSM with regard to overcoming the tyranny of distance suggests either that Flinders has not learned from previous feedback, or more likely, that effective technology is still not available and/or affordable for universities and health services in low resource settings. Other persistent issues, for example maximising the workforce return on





investment for the clinicians and communities involved, are a priority area for further research and development that is likely to require broader action than just the undergraduate curriculum.

From these data it can be seen that continuity is a key element of the success of these year-long clinical programs based in small rural communities<sup>12</sup>. Related to this is the importance of relationships in medical education as a motivational and integrative force<sup>19</sup>. The authors recognise that student self-selection may be also a positive influencing factor in terms of the success of these programs. Further research is necessary to untangle the effects of these factors, but is likely to show they are all significant.

It is not clear from these data whether the concept of integration is a product of continuity or a pre-requisite for achieving it in these settings – however, it is probably both. For example, it would be difficult to utilise these small community sites if the curriculum was delivered in 6–8 week blocks. The patient load is such that students could not be guaranteed sufficient exposure to a particular discipline's important conditions in 8 weeks, but this is possible if the learning is integrated and therefore relevant patients can be accessed over the entire year.

In addition though, the data show that continuity enables the building of significant relationships with patients and their families. This facilitates and makes integration explicit, as it is apparent that to care for a whole person in the community context, an integrated approach must be taken. Each person and family will often have problems associated with different disciplines concurrently. For example a patient presenting for surgery may also have significant medical and mental health concerns. While it is possible for students in short-term rotations also to see these co-morbidities, the uni-disciplinary supervision and assessment focus usually prioritises the student learning to the particular single discipline and the opportunity for integration is missed.

While the PRCC and CCC programs promote rural family practice as a future career choice, students from Flinders

have successfully entered the full range of specialist disciplines, and despite the concerns voiced, all of the first cohort of NOSM graduates successfully matched to their preferred specialist residencies.

## Conclusions

To the authors' knowledge, this is the first report in the literature of a common evaluation of longitudinal integrated clerkships on two continents and two hemispheres. Its value lies in the common methodological approach used by an independent evaluator at both medical schools. The congruence of the findings is strong evidence that the issues identified are likely to be important for other sites contemplating this form of clinical clerkship.

This study provides strong evidence, from two contrasting contexts, for the success of the paradigm of the rural longitudinal integrated clerkship approach to teaching the core clinical components of the undergraduate medical curriculum. A positive impact on both students and clinicians was shown in both sites. Further research is required to assess the attitudes of patients and their communities to this educational approach.

In addition to a better understanding of why rural longitudinal integrated clerkships work, 5 key factors were identified in this research that may help others who wish to implement a similar program:

1. *Invest in careful site selection:* Ensure that there is a match between the epidemiology of the community and the curricular expectations, and then ensure that the students are able to be present at and participate in the major decision points in the patient's care. Preferably create spare capacity so that fluctuations in student supervisory capacity can be accommodated.
2. *Create collegiate faculty development:* Facilitate peer-to-peer links between teaching hospital-based



faculty and community-based faculty to assist in standardisation of teaching and assessment.

3. *Integrate IT systems with the health system:* As much as possible, build IT systems that integrate the health service with the university and enable sharing of major hardware items (eg video-conferencing systems).
4. *Manage student expectations:* Recognise that each site will be different, with its own relative strengths and weaknesses, and build a culture of 'many roads leading to one goal'. Prepare for students to feel isolated at times during the clerkship and have proactive strategies for normalising and managing this.
5. *Build strong local postgraduate training that reinforces the values of the undergraduate program:* Where no suitable postgraduate training occurs in the rural locations there is likely to be a diminution of the workforce benefit created by the rural longitudinal integrated program. Consider parallel development of postgraduate rurally based training with synergies in curriculum, faculty development, leadership and administration.

These key factors build on the existing evidence of what is required to create a longitudinal integrated clerkship in small rural communities<sup>20-22</sup> and can serve as encouragement for academics, students, rural clinicians and health service managers, government policy makers, and rural community leaders to work together to create effective and sustainable rural academic programs that meet the needs of all involved.

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