

JRMC | Journal of Regional Medical Campuses

Feasibility of Peer-Led Didactics in the Core Clinical Year on a Regional Medical Campus

Christine Waasdorp Hurtado, MD, FAAP; Erik Wallace, MD, FACP; Chad Stickrath, MD, FACP

DOI: <https://doi.org/10.24926/jrmc.v2i5.2138>

Journal of Regional Medical Campuses, Vol. 2, Issue 5 (2019)

z.umn.edu/JRMC

All work in JRMC is licensed under CC BY-NC



Feasibility of Peer-Led Didactics in the Core Clinical Year on a Regional Medical Campus

Christine Waasdorp Hurtado, MD, FAAP; Erik Wallace, MD, FACP; Chad Stickrath, MD, FACP

Abstract

Purpose

The best methods for learning outside of the clinical setting in the core clinical year, especially at Regional Medical Campuses with limited full-time academic faculty, are unknown.

Methods

We developed and implemented a peer-led didactic program to complement our longitudinal integrated clerkship (LIC) for students at our new regional medical campus (RMC) to achieve the same goals, objectives, and competencies as students at our main campus. These didactic sessions were developed and led by students for their peers with the assistance of community faculty members. Student scores on USMLE Step exams and National Board of Medical Examiner (NBME) subject exams for the core specialties were compared among the intervention group at the Regional Medical Campus, the main campus, and the national average. Finally, a student focus group and survey provided qualitative data about student perceptions of these sessions.

Results

Among participating students who completed the survey, 19 (95%) reported that the student-led didactics were relevant to their clinical work and 16 (80%) reported that these sessions enhanced their knowledge and the content was provided at the right pace and level. Students ranked preparing to teach student-led didactics as one of the most valuable learning experiences and “worth the time it took to prepare.” Students scored comparably to their main campus peers on all 7 NBME subject exams and the Step 2 CK exam.

Conclusion

Utilizing peer-led didactics as a part of a longitudinal integrated clerkship is feasible and effective in helping students achieve the goals, objectives, and competencies of the core clinical year. This educational method should be considered at other regional medical campuses and LIC-based programs.

The authors do not have any conflicts of interest to disclose. This project received no funding. As all data were completely anonymized and no patients were involved, this was not reviewed by an ethics board.

Introduction

In 2016, the University of Colorado School of Medicine, a large University-affiliated public medical school, launched its first regional medical campus (RMC) in a large urban setting in Colorado Springs, CO. Students at the RMC, which educates up to 24 students (n=21 for the inaugural class) during the core clinical year, were expected to achieve the same goals, learning objectives, and competencies as the students at the main campus, which utilizes a traditional block model with faculty provided didactics. Faculty utilize several different teaching modalities including Powerpoint lectures, Team Based Learning, and small groups discussions. To fulfill these expectations, students completed a longitudinal integrated clerkship (LIC) with comparable clinical experiences and a complementary didactic component. Since the RMC relied primarily on community-based, volunteer clinical faculty compared with full-time academic faculty on the main

campus, we utilized alternative teaching methods, in particular, peer-teaching for delivering core didactic content. Benefits of peer teaching have been described in the medical education literature; however, these benefits have not been specifically reported in the core clinical year.

Peer based learning is a well-established educational strategy in which peers teach peers with demonstrated educational advantages for peer teachers, and to a lesser degree, for peer learners.¹⁻³ One study showed that medical student peer teachers in an Advanced Cardiac Life Support (ACLS) course demonstrated improved understanding of the course concepts compared with peers who prepared to teach, but did not teach, both immediately following their teaching and in follow-up testing 60 days later.⁴ Another study showed improved confidence among medical student peer teachers in material they taught.⁵ Educators postulate that the time spent in teaching preparation allows for a deeper

Christine Waasdorp Hurtado, MD, FAAP

Erik Wallace, MD, FACP

Chad Stickrath, MD, FACP



understanding of the material.^{1,4,6} Re-accessing the material to teach to their peers allows for development of scaffolding to previous knowledge which improves retention. One study demonstrated improved testing outcomes for 29 of 36 courses taught by peers compared to faculty.⁷ Others have shown that these benefits occur without sacrificing the performance of peer learners.^{8,9}

In addition to the favorable peer learner performance found in peer teaching studies, previous studies found peer learners frequently preferred peer-led lectures to faculty-led sessions.⁹⁻¹² Other studies reported that students found peer-led sessions to be more interactive and taught at a more appropriate level.⁶ Finally, the literature suggests peer learning may lead to more frequent utilization of high-yield and interactive teaching modalities, which may improve learning and satisfaction.¹³

An additional benefit for medical student peer teachers is the development of teaching skills that are required in residency. The Liaison Committee on Medical Education (LCME) specifies that residents must be prepared to teach and evaluate medical students.¹⁴ Medical student peer teaching develops the knowledge, skills, and attitudes to be effective educators during residency. Moreover, evidence suggests that students who teach their peers in medical school go on to be better teachers in clinical practice, which may directly improve patient care.^{1,6}

Resources available at a RMC that utilize primarily community-based, volunteer clinical faculty are different than those at a traditional academic medical center. Effective methods, outside of the clinical setting, to help medical students learn the important concepts from the core clinical year are not well defined. We aimed to implement and evaluate a primarily student-led, faculty-assisted longitudinal 10-month didactic curriculum as a part of the LIC at our new RMC to help students achieve the goals, objectives, and competencies of the core clinical year.

Program Description

RMC students were selected prior to starting their first year of medical school. Upon acceptance to our institution they were asked their preference between several programs, including the RMC. In order to be considered they were required to complete an essay indicating their interest in our campus. A committee comprised of members of the admissions committee and the local RMC community selected 24 students from the incoming medical school class. All students complete the first 2 years and take the USMLE Step 1 at the main campus and RMC students then complete their core clinical year at the RMC. At the start of their fourth year all students complete a sub-internship at the main

campus. They complete their fourth-year rotations at the RMC, main campus or away, similar to their peers.

For the core clinical year, students at the RMC completed 8 weeks of inpatient clinical immersion experiences, followed by a 10-month LIC. In addition to working with preceptors in the clinical environment, students engaged in a year-long didactic curriculum. The didactic curriculum at the RMC was developed to cover learning objectives and content comparable to the traditional block clerkship model on the main campus. However, the RMC curriculum utilized an integrated, developmentally appropriate curriculum that was mostly student-led and faculty supported. To minimize clinical interruptions, 4-hour didactic sessions were held on Friday afternoons. Every student was assigned to provide one 4-hour didactic session. Students were assigned a topic with associated learning objectives and provided a community faculty advisor who was a subject matter expert. Each student/faculty team was given the liberty of presenting the material with PowerPoint, case-based learning, problem-based learning, algorithm development, games (i.e. game show formats) or other techniques. Sessions were developed over a 4-6-week time frame. Students led the sessions with faculty providing assistance through insights, personal examples, answering questions, and ensuring the accuracy of the materials and discussion.

Over the course of the year, there were approximately 140 hours of scheduled didactic time. Faculty-led sessions were utilized in the first 2 months while the students were on clinical immersions. Topics were interspersed over the course of the year with a focus on each specialty prior to the required National Board of Medical Examiners (NBME) subject exam.

Each week at the start of the didactic session, students were given a short quiz based on pre-reading to help prepare for the in-class material. The open-book quiz was completed in groups of 4 to 5 students over 20-30 minutes. Following the didactic session, students were given an individual 10-question quiz that covered all didactic sessions completed to date with 2 to 3 questions on the material covered that day.

Methods

To assess the feasibility and efficacy of the educational program, required NBME subject exams were used to assist in knowledge assessment in 7 of the institution's core clinical specialties in addition to 2 pass/fail in-house exams for musculoskeletal care and emergency medicine. These exams occurred every 2 to 4 weeks in the second half of the academic year. Students took United States Medical Licensing Exam (USMLE) Step 1 prior to starting the LIC and Step 2 one to 3 months after completing the LIC with a 30-day study

period to prepare. The main campus students had the same timing and study periods.

Students completed online evaluations after each didactic session to assess perceived efficacy of the session. To evaluate new RMC and the impact of the didactic curriculum, all students (n=21) participated in a focus group and were provided a survey at the end of the year, which included 5 questions about the overall didactic curriculum and a ranking of the efficacy of the various types of non-clinical learning methods they experienced. Statistical analysis utilized appropriate t-tests for comparison.

Results

The survey was completed by 20 of our 21 students (95.1% completion), with a few questions completed by only 19 students.

Our RMC students did not differ significantly on entrance into medical school with MCAT scores and GPAs not statistically different by t-test. On entrance into our RMC, their Step 1 scores were slightly higher, although not significantly, than the main campus. At completion of their clinical year at our RMC their Step 2 Scores were slightly higher than their main campus peers, although again not significantly.

Of the 140 hours of didactics, 85 hours (61%) were student-led and 55 hours (39%) were faculty-led. Among participating students, student survey data demonstrated 16 (80%) felt that student-led didactics were provided at the right level for their knowledge and skill base. Nineteen of students completing the survey (95%) reported the student-led sessions were relevant to their clinical work. Most students, 15 out of 19 responding to question, (79%) felt more engaged in student-led didactics compared to faculty led lectures (Table 1). Eighty percent of the students felt that student led sessions enhanced their knowledge. Students self-reported spending an average of 9.45 hours (2-23, Median 8) preparing to lead each session; however, 17 (85%) of the students thought the time required in preparation to lead the session was “worth it” with only 3 students disagreeing. A portion, 4 of the 19, (21%) reported they did not find the peer-led sessions more engaging and 4 (20%) did not feel the sessions enhances their medical knowledge.

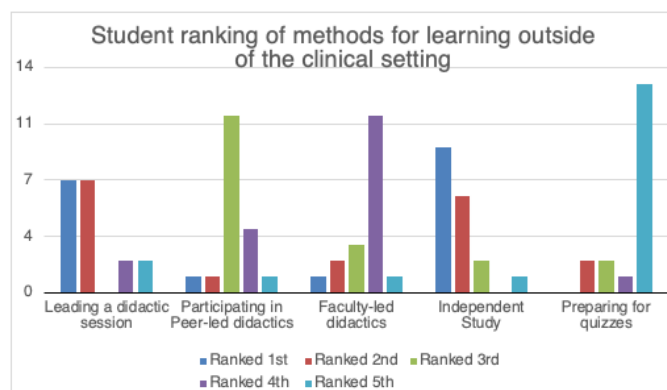
Table 1. Student Rating of Student-led Didactic Sessions

Student agreement with the following statements about Friday didactic sessions. (n=19 or 20)

Learning Techniques	Strongly disagree	Mostly disagree	Somewhat disagree	Somewhat agree	Mostly agree	Strongly agree	Total	% Positive responses
As a participant in a student-led session, I felt more engaged in the session than if led by a faculty.	2	2	0	2	10	3	19	79
As a participant in a student-led session, I enhanced my level of knowledge.	1	2	1	7	8	1	20	80
Preparing to lead a didactic session is well-worth the effort and time involved.	1	1	1	3	8	6	20	85
The weekly group quizzes enhanced my learning.	2	4	2	8	3	1	20	60
The weekly individual quizzes enhanced my learning.	1	3	1	6	8	1	20	75

In comparing the relative efficacy of various learning methods, students ranked independent study and leading a didactic session as the 2 most effective methods, followed by participating in student led-didactics, participating in faculty-led didactics, and preparing for required quizzes (Figure 2). Students commented that “(some) faculty-led sessions were too basic or superficial (and some) were overly detailed beyond relevance to us. Overall, I feel that the student-led sessions were at a better ability level and more practical.” Another student commented, “Preparing a didactic lecture was one of the most educational experiences of the year. I still remember the subject matter from my talk near the beginning of the year.”

Figure 2. Student ranking of preference of learning methods utilized outside the clinical setting at our RMC (N=18)



Evaluations were completed by students after each session (Table 3) and showed no significant difference between the faculty and peer-led session evaluations with the exception of faculty wrapping up sessions with clear take home points more consistently than peer educators. There was no

significant difference in audience-engagement or overall assessment.

Table 3. Summary of Post-session Didactic Student Evaluations key data for the academic Year

Evaluation	Faculty Average Score	Student Average Score
Clear Take Home Messages	4.5 (p= 0.05)	4.31
Audience Engagement	4.38	4.31
Overall Assessment	4.48	4.43

Finally, among the 7 required NBME subject exams, RMC students performed comparably to their main campus peers who participated in the traditional block curriculum with faculty lectures (Table 4). RMC students also performed comparably to main campus peers on their USMLE Step 2 Clinical Knowledge exam.

Table 4. Student Performance on all 7 NBME Subject Exams for the 2016-2017 Academic Year

NBME Subject Exam	RMC Student Mean (n=21)	SOM-Main Campus Student Mean (n=164)	NBME National Mean
OB/Gyn	79.0	76.5	76.6
Neurology	79.1	73.1	78.6
Psychiatry	82.1	80.6	79.8
Pediatrics	78.2	76.0	76.6
Surgery	75.1	72.2	72.8
Inpatient IM	78.5	74.0	74.7
Adult Ambulatory Medicine	81.0	74.3	75.5

Discussion

Students preferred peer-led didactics. Surveys indicated that students perceived peer-led didactics to be valuable as both a teacher and learner, worth the time required to prepare to lead a session, and typically presented at a more appropriate level and in a more engaging way than faculty-led sessions. The process of teaching peers ideally provides them with the knowledge, skills, and attitudes to be a better teacher as they transition to fourth year and residency. Most importantly, students at the RMC performed comparably on standardized tests compared with students on the main campus, supporting the feasibility of utilizing peer-led didactics in the core clinical year.

Our finding that students participating in peer-led sessions as a teacher perceived the experience to be a valuable learning experiences is consistent with the peer teaching literature in other settings. One study showed that peer teachers felt more confident than non-teacher peers in material they prepared and that teachers may have out-performed non-

teachers on exams.¹⁵ Peer teachers in an ACLS and Electro Cardio Gram (ECG) interpretation courses demonstrated the greatest exam score gains on material they prepared for and taught. These results were durable in delayed post-tests.⁴ We were encouraged to find that in our setting where students are intensely busy with their clinical obligations, they found time to prepare to teach sessions and found this time was worth it. However, because the students interacted with the material in such a deep manner, they may have experienced improved retention and therefore a reduction in the amount of studying required on that topic at exam time. The utilization of a longitudinal integrated clerkship model, with its attendant increase in student scheduling flexibility, may have also made preparing to teach a session more feasible.^{16,17}

Students also felt that participating in a peer-led session as a learner was beneficial and generally preferable to participating in a faculty-led session. Other medical education teaching methodologies that utilize a high amount of peer teaching, such as problem-based learning (PBL) and team-based learning (TBL), have been shown to be highly beneficial for peer learners. One study demonstrated improved clinical reasoning following TBL sessions, when directly compared to interactive seminars, without differences in multiple choice exam performance.¹⁸ Another study showed long-term improvements in team dynamics, problem solving, communications skills and perceived self-learning in addition to development of professionalism associated with TBL.¹⁹ Also, PBL techniques resulted in improved knowledge outcomes and perhaps more importantly, increases in self-directed learning.²⁰ The benefits of PBL include improved integration of basic science and clinical knowledge, improved team working skills and professionalism all in a model that students find more enjoyable and stimulating. Many of our peer-led sessions employed PBL and TBL approaches to learning and it may be that these relatively newer methodologies were more readily considered and more easily implemented in our peer-led sessions. In addition, the benefits of peer teaching may be related to feeling an increased sense of responsibility to their peers. This has previously been reported in one study which evaluated gross anatomy learning using reciprocal peer teaching (RPT) and found that 83% of students agreed or strongly agreed that they were more likely to read prior to RPT compared to 35% with traditional methods (i.e. – faculty led sessions).¹³

Although we did not explicitly measure the development of teaching skills by our students who were peer teachers, studies have shown that peer teachers develop teaching skills and are more likely to express an interest in continued involvement in teaching.²¹ Since medical students are expected to teach as residents and as practicing physicians, it is important to find mechanisms such as medical student peer

teaching to help them develop teaching skills in a mentored environment.

We must also consider the benefit of reducing the teaching burden on our volunteer clinical faculty. They spent an average of 2.5 hours in reviewing the material and preparation with the students. The majority of our faculty (82%) reported the process to be enjoyable a plan to continue supporting our peer led didactic program.

Many factors likely contributed to the success of our students during their core clinical year and it is difficult to attribute their performance on medical knowledge assessments, such as NBME subject exams and Step 2 Clinical Knowledge exam, entirely to the peer-led didactic component of their year. It is likely the LIC and other factors played a significant role in their testing outcomes. Regardless of these confounders, our experience and outcomes demonstrate peer-led didactics can be utilized as an effective methodology to accompany an LIC curriculum in the core clinical year.

Limitations of our study include a small sample size of selected students, the lack of higher level, downstream outcomes such as information on how our students transition to residency and how our curriculum affects their future teaching and learning.

Conclusions

It is feasible to utilize a student-led, faculty supported didactic curriculum as a part of a longitudinal integrated clerkship at a regional medical campus to help students achieve the goals, objectives, and competencies of the core clinical year. Peer-led didactics should be considered as a part of longitudinal integrated clerkships at other institutions.

Further evaluation of peer-led didactics can help us understand if they are more effective than traditional didactics. Longer term follow-up can allow us to employ more sensitive assessments to pick up other differences in this modality (the development of teaching skills, testing differences, and any benefit of having teaching presentations on residency applications).

References

- Bene KL, Bergus G. When learners become teachers: a review of peer teaching in medical student education. *Fam Med*. 2014;46(10):783-787.
- Bennett SR, Morris SR, Mirza S. Medical Students Teaching Medical Students Surgical Skills: The Benefits of Peer-Assisted Learning. *J Surg Educ*. 2018.
- Tai JH, Canny BJ, Haines TP, Molloy EK. Implementing Peer Learning in Clinical Education: A Framework to Address Challenges In the "Real World". *Teach Learn Med*. 2017;29(2):162-172.
- Gregory A, Walker I, McLaughlin K, Peets AD. Both preparing to teach and teaching positively impact learning outcomes for peer teachers. *Med Teach*. 2011;33(8):e417-422.
- Nestel D, Kidd J. Peer assisted learning in patient-centred interviewing: the impact on student tutors. *Med Teach*. 2005;27(5):439-444.
- Ten Cate O, Durning S. Peer teaching in medical education: twelve reasons to move from theory to practice. *Med Teach*. 2007;29(6):591-599.
- ten Cate O, van de Vorst I, van den Broek S. Academic achievement of students tutored by near-peers. *International journal of medical education*. 2012;3:6-13.
- Rudland J, Rennie S. Medical faculty opinions of peer tutoring. *Education for Health*. 2014;27(1):4-9.
- House JB, Choe CH, Wourman HL, Berg KM, Fischer JP, Santen SA. Efficient and Effective Use of Peer Teaching for Medical Student Simulation. *West J Emerg Med*. 2017;18(1):137-141.
- Escovitz ES. Using senior students as clinical skills teaching assistants. *Acad Med*. 1990;65(12):733-734.
- Jayakumar N, Srirathan D, Shah R, et al. Which peer teaching methods do medical students prefer? *Education for health (Abingdon, England)*. 2016;29(2):142-147.
- Mills JK, Dalleywater WJ, Tischler V. An assessment of student satisfaction with peer teaching of clinical communication skills. *BMC Med Educ*. 2014;14:217.
- Manyama M, Stafford R, Mazyala E, et al. Improving gross anatomy learning using reciprocal peer teaching. *BMC Med Educ*. 2016;16:95.
- AAMC. *Functions and Structure of a Medical School* 2018.
- Iwata K, Furmedge DS, Sturrock A, Gill D. Do peer-tutors perform better in examinations? An analysis of medical school final examination results. *Med Educ*. 2014;48(7):698-704.
- Hirsh D, Gaufberg E, Ogur B, et al. Educational outcomes of the Harvard Medical School-Cambridge integrated clerkship: a way forward for medical education. *Acad Med*. 2012;87(5):643-650.
- Latessa R, Beaty N, Royal K, Colvin G, Pathman DE, Heck J. Academic outcomes of a community-based longitudinal integrated clerkships program. *Med Teach*. 2015;37(9):862-867.
- Brich J, Jost M, Brustle P, Giesler M, Rijntjes M. Teaching neurology to medical students with a simplified version of team-based learning. *Neurology*. 2017;89(6):616-622.

19. Zgheib N, Dimassi Z, Bou Akl I, Badr K, Sabra R. The long-term impact of team-based learning on medical students' team performance scores and on their peer evaluation scores. *Med Teach*. 2016;38(10):1017-1024.