Validate entrustable professional activity (EPA)-based assessment in pathology residency training for common on-call activities

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Background

Entrustable professional activities (EPAs) evaluate a resident's performance of a specific activity and link to competencies, which can inform assigning graduated responsibilities (e.g. taking call). At the University of Vermont (UVM), the Clinical Competency Committee (CCC) decides whether a resident is competent to take call, but it is currently operating with limited data (personal communication with CCC chair). EPAs were implemented in 2019 as a way to assess residents' skills and abilities in frozen section training, a key On-Call activity, prior to starting taking call.

Methods

The proposed use of the EPAs in this study is to provide data to the CCC to inform decisions about a resident's competency to take call. This validation study follows the Kane Framework (*scoring—generalization—extrapolation—implication*) by providing multiple pieces of evidence for the CCC to review. Residents' performance of intraoperative consultations during their surgical pathology rotation were evaluated by multiple EPA-based formative assessments (*scoring*). Residents were assigned an entrustment level at the end of the rotation (*generalization*). Formative and summative assessments were reviewed by the CCC (*extrapolation, implication*) to determine readiness to take call.

The CCC was surveyed regarding their confidence in assessing resident readiness to take call, prior to the addition of EPAs to the assessment portfolio (December 2019).

EPAs were added to the PGY1s first week of frozen section training (Dec 2019-Feb 2020). Residents were instructed to ask for ~5 formative EPAs throughout the week. One summative assessment was completed on each resident in Spring 2020, based on review of all formative EPAs. Formative and summative EPAs were provided to the CCC for the Spring 2020 semi-annual review.

Residents, faculty, pathologists' assistants (PAs) and CCC members were surveyed in June 2020 about the ease of use and usefulness in EPAs in June 2020.

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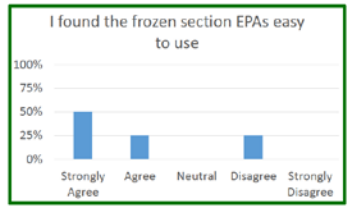
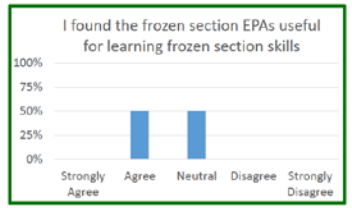
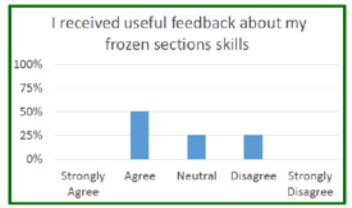
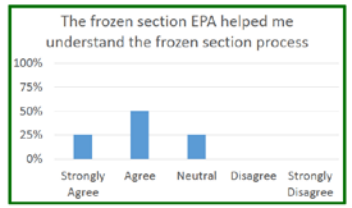
Survey Results

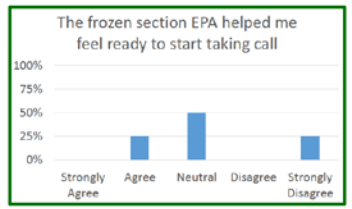
Residents (n=4)



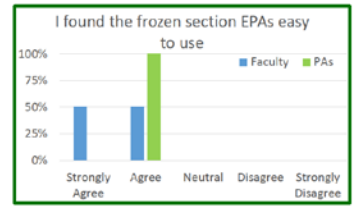


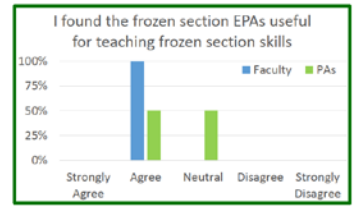


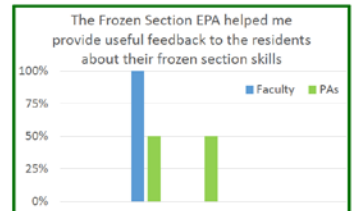


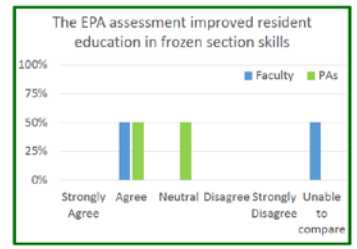


Faculty (n=4) and PAs (n=2)

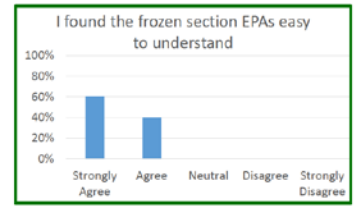


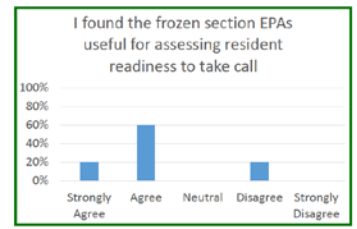


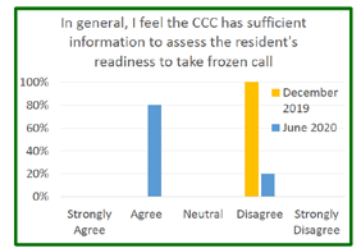


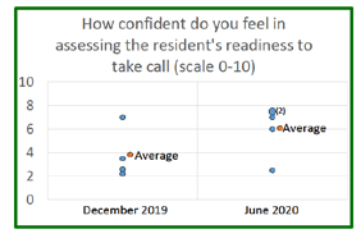


CCC (2019-n=4; 2020-n=5)









EPA Tally	Total # EPAs completed	# competed by PA	# Competed by Faculty
Resident 1	4	2	2
Resident 2	5	2	3
Resident 3	3	3	0
Resident 4	5	0	5

Results

Most survey respondents found EPAs easy to use, useful, and facilitated feedback. Those who were less positive about EPAs pointed out ways to improve the incorporation into training, including dividing into technical and interpretive aspects and having the formative assessment on hand in the frozen room for more consistent and timely completion. Residents had improved understanding of the frozen section process through the use of EPAs, as the knowledge and skills statement clearly lays out expectations of this professional task

When asked if the CCC had sufficient information to assess residents readiness to take call, 100% disagreed with that statement in December 2019, while 80% agreed with that statement in June 2020 (after EPAs were included in the residents' assessment portfolios). The average CCC member's confidence in assessing readiness to take call (on a sliding scale of 1-10), went from 3.8 to 6.1 between December 2019 and June 2020.

CCC members noted in December 2019 "more assessment and faculty input is needed" and "there is very little objective data on performance." Comments in June 2020 noted that "more information was provided than previously", and "EPAs on frozen section were very helpful with respect to frozen section call."

Conclusions

The majority of people responded favorable to the addition of EPAs in training and assessment, with some helpful suggestions on incorporating the formative assessment into workflow.

The Kane framework of validation focuses on building evidence (EPAs) for decision making (ready to start taking call). Residents and CCC members reported different levels of confidence around readiness to take call. With the addition of EPAs in the assessment portfolio, most CCC members agreed they had sufficient information and felt more confidence in assessing a resident's readiness to take call. In contrast, most residents found EPAs useful for learning, but did not feel ready to start taking call after one week of frozen training.

The COVID pandemic had a significant impact on resident training and assessment. All PGY-1 residents completed their foundational one week of frozen training, but continued frozen training (one morning each week during 2-3 subsequent SP rotations) was put on hold in March 2020 and has yet to be restarted. Therefore, no additional EPAs were available for the December 2020 semi-annual review, when the CCC makes a formal decision about residents starting call. The loss of 9 months of training and assessment undoubtedly impacted the *scoring* step in this validation study, which in turn weakens the *extrapolation* and *implication* arguments. Indeed, Kane cites educators tend to find validity in decision after reviewing limited evidence, which may be the case in this study given the sharp increase in confidence by the CCC in assessing resident readiness to take call. Nevertheless, this data shows a promising trend as EPAs were useful in assessing specific skills necessary for resident's clinical responsibility. Expanded and continued use of EPAs across training will likely continue to provide valuable data to residents and the CCC, along with further opportunities for validation.

Please contact Bronwyn Bryant at Bronwyn.Bryant@uvmhealth.org with any questions

The author attests that there is no conflict of interest in the research presented

Engage in Exploration

Ronald Bryant, MD; Rebecca Wilcox, MD; Bei Zhang, MD, PhD, CLS

Pre-class prep coordination
Paperwork
Station set up
Facilitator assistant
Clean up

Lab Manager

Print & laminate in-class questions
Scheduling
PPE supplies
Active Learning Team
Pre-class recordings uploading

Mr. Bruce Kimble

Active Learning in Gross Pathology

Pathologists

3. Pre-class recording production
2. Lab station design
1. Specimen selection
4. Facilitate in class

Students

Watch Recordings
Show up on time
Social Distancing
Look & think
Learn in pair
Provide feedback
Ask questions
Answer questions

"I am really interested in seeing the gross specimens and correlating the physical findings with what we are learning in class, such as seeing different aortas with atherosclerosis, or heart sections, or lungs, etc."

"I thought the gross pathology labs were incredible. They were a quick and easy way to really cement ideas in your mind and have visuals/tactile sensations to go along with these ideas and concepts."

"I find that if I can see the gross pathology in person, it helps lock in the disease process into my long-term memory."

"I feel like the faculty puts in a lot of time in preparing for these sessions, and as a student, I want to support the faculty just as the faculty supports us."

Mobile Syringe Exchange as an Opportunity for Community Engagement and Medical Education

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The Robert Larner, M.D. College of Medicine at The University of Vermont

INTRODUCTION:

- People who inject drugs (PWID) are burdened by infections, abscesses, and overdoses.[1]
- In rural areas, supplies to keep PWID safe are often far away and travelling is a barrier.[2]
- Medical students are often removed from the realities of rural drug use.[3]
- It is important for students to be cognizant of ways to care for PWID and decrease stigma.[4]

METHODS:

- We provided harm reduction equipment (sterile syringes, disposal methods, clean rigs, and fentanyl test strips), overdose prevention counseling, vein care information to PWID in Franklin county using a mobile van and texting app.
- We created a student interest group(SIG) at LCOM to stimulate conversations about harm reduction and PWID.
- We maintained relationships with PWID, and characterized the number of distinct and new participants, and secondary exchangers. We quantified syringes, fentanyl test strips, wound care kits and naloxone distributed to participants.
- We identified additional student leaders and completed the first overdose reversal training at LCOM.

RESULTS:

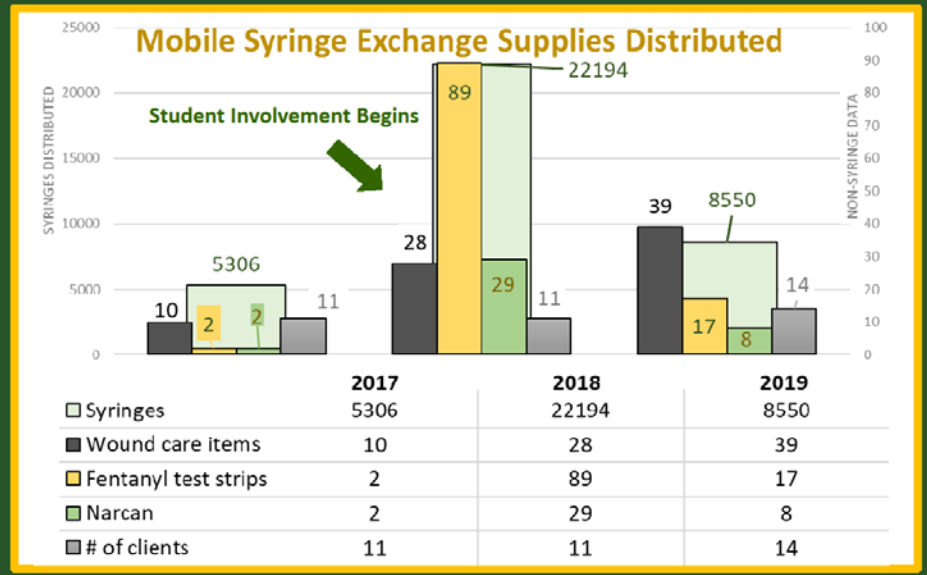
In 2018, medical students dispensed:
- 22,194 syringes
- 28 hygiene kits
- 89 fentanyl test strips
- 29 doses of naloxone

to 11 unique clients
of which 11 were secondary exchangers.

In 2019, medical students dispensed:
- 8,550 syringes
- 39 hygiene kits
- 17 fentanyl test strips
- 8 doses of naloxone

to 14 unique clients
of which 7 were secondary exchangers.

In 2019, LCOM's first Harm Reduction SIG was created.
- 38 medical students enrolled
- 4 student leaders were identified to continue the mobile exchange project
- 46 students were trained in responding to overdose, all of whom were equipped with naloxone.



	2017	2018	2019
Syringes	5306	22194	8550
Wound care items	10	28	39
Fentanyl test strips	2	89	17
Narcan	2	29	8
# of clients	11	11	14

DISCUSSION:

- Community engagement is an important educational experience for medical students to contextualize the lives of PWID.
- Such interactions generate powerful impressions that decrease stigma.[3]
- Medical students can play a role in serving PWID by providing an essential service, bringing educational components to their classmates, and engaging them in conversations about caring for PWID.

FUTURE DIRECTIONS:

- It is important to continue to expose medical students to the realities and medical needs of PWID through a variety of modalities.
- This could include service projects and sessions in which PWID are brought into the formal learning environment as educators.
- To gauge the effectiveness of these interventions, pre- and post-surveys regarding student perceptions could be administered, and service delivery should continue to be quantified.

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Evaluation of the Public Health Statistical Boot Camp Pilot Project

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LARNER COLLEGE OF MEDICINE

Background

Masters in Public Health (MPH) students are required to apply statistical thinking and techniques as part of their capstone project. However many students may not have taken quantitative courses recently, or may have gaps in their knowledge or skills. In the LCOM MPH program, capstone projects are done by teams of 4 – 5 students per team; two students on each team lead the data management and data analysis components, respectively.

MPH program faculty collaborated to develop a series of online, asynchronous self-directed learning modules addressing common areas where students need help in their capstone projects. Topics were identified based on observation of the areas where students have struggled in earlier capstone projects and include:

- Data cleaning and management
- Describing data
- Changing and recoding variables
- Statistical testing and regression
- Regression model building
- Working with weighted datasets

Pilot testing of the modules took place in the MPH capstone course *PH392: Culminating Project Experience* in the fall of 2020.

Methods

Each module contains a mix of instructor videos, screencasts, practice/application exercises and self-assessment/reflection questions. SPSS was the statistical software used, and students were given an example dataset that carried through most of the demonstrations and exercises. Completion time was estimated at 4 – 5 hours total per student, and there was no time limit. Students were allowed to leave and return to the modules, and could repeat the practice exercises and self- assessment and reflection questions.

To date we have developed 8 modules
- 6 core modules (summarized here)
- 2 introductory or supplemental modules

Self-assessment data were collected at the end of each module

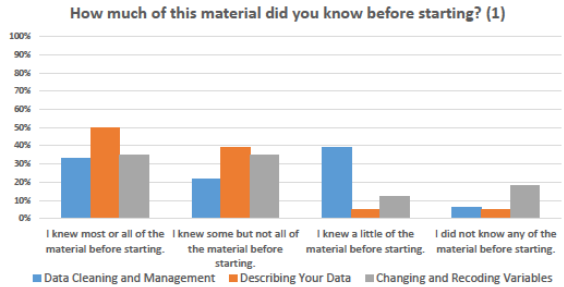
End of module questions assessed prior knowledge of the topic, acquisition of skills and readiness to apply what was learned
- Summaries were grouped by data preparation and analysis
- Used a 4 point response scale (displayed on the figures)

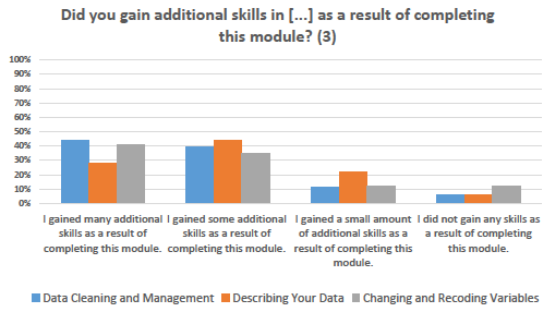
Student completion of modules varied from 9 to 20

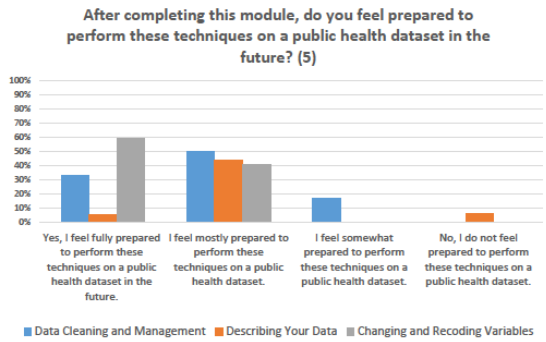
Participation was required for students with a data-specific role.

Results: Assessment/Reflection Questions

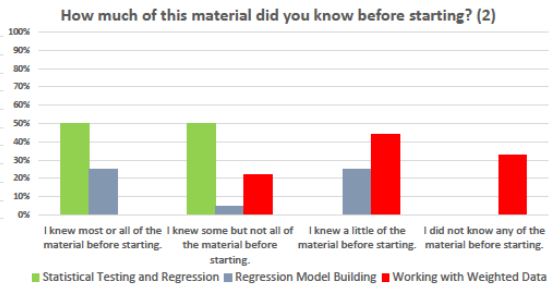
Data Preparation Topics

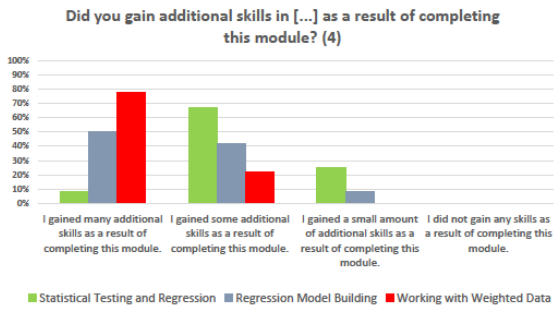


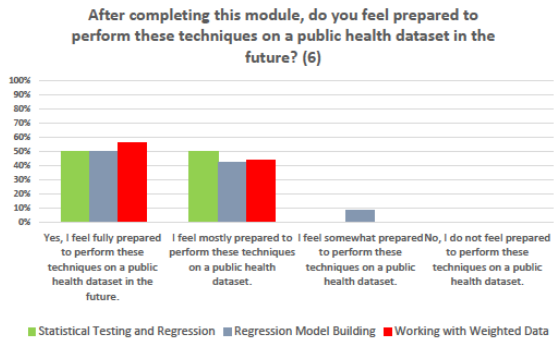




Data Analysis Topics







Conclusions

The UVM LCOM Public Health Statistical Boot Camp appears to be an acceptable and valued educational intervention, based on student feedback.

The different topics varied in terms of students' self-rated comfort and readiness to apply relevant skills and thinking. Very few students indicated higher levels of comfort with their prior knowledge across all of the topic areas. It is possible that future Boot Camp offerings could be tailored to specific areas of need for individual students. Additional topics (modules) will likely need to be added to further strengthen students' readiness to perform data analysis in the capstone projects.

The Boot Camp approach offers students an opportunity to better prepare for applying the quantitative competencies they develop during the MPH program, particularly for students who need to brush up on specific statistical topics.

Limitations

- Descriptive data summary
- No comparison group
- Assessment of changes in knowledge and skills is limited

Next Steps

- Formal qualitative analysis of open-ended responses
- Strengthen assessment of students' learning associated with the modules
- Examine if module performance is associated with application of quantitative skills in capstone projects
- Collect second MPH student cohort (and assess completion time better)
- Check alignment of topics with other MPH programs and curricula
- Expand qualitative assessment of students' experiences

Acknowledgements

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Impact of peer-to-peer discussion series on medical student assessment of racial justice education

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Special Thanks to our Faculty Mentor:
Dr. Prema Menon

Introduction

Medical schools have been increasingly made aware of curriculum gaps relating to social determinants of health in the preclinical curriculum. Following recent national attention to the significance of race and health, there has been an effort to improve bias training and didactic education on racism. However, these often take the form of online modules or lectures that do not allow peer-to-peer dialogue. Creating open discussions around race has shown benefits in healthcare work settings and faculty development, but there is limited research on its usage in medical schools. The "Race Dialogues" was designed as an elective summer discussion series. Participants were asked to complete pre- and post-surveys, and a post-series open-ended reflection.

Aims

Aims of discussion group:
- To create an environment for medical students to discuss race with their peers through open dialogue
- To help medical students learn tools to address systemic and internalized racism in healthcare

Aims of the study:
- To assess medical students' beliefs about the intersection of race, racism, and medicine after participation in the "Race Dialogues."
  - Assessing student understanding of race and racism in medicine, comfort discussing race and racism, and beliefs about discussing race and racism in medical school.

Methods

The "Race Dialogues" was designed as a weekly discussion series (total 6 weeks)
- Made available to medical students and staff at the Larner College of Medicine.
- Six sessions were conducted (1.5 hours each) led by a faculty, student, or community member via online video conference.
- Unique topics concerning the history and legacy of race and racism in the United States were presented each week with optional supplementary readings and videos available (see table for topics).
- Participants present at the first session were asked to complete a pre-survey (Survey A) after completion of the first session. All participants were invited to complete the post-survey (Survey A) and a post-series reflection (Survey B) after completion of the series.

Data analysis information:
- All communication with participants was conducted via email. Surveys were completed in RedCap software. No PHI was collected and surveys were anonymized.
- Study design and surveys were reviewed by the University of Vermont IRB committee and was granted category 2 exemption.
- Basic summative statistics and qualitative methods were used to analyze survey response

Session	Topic	Facilitator
Session 1	*Introduction to Racism in Healthcare*	Dr. Lee Rosen, PhD
Session 2	*Racism in Medical Education*	Dr. Tim Lahey, MD
Session 3	*Mass Incarceration: Discussion of 13th Documentary*	Student speaker: Krisandra Kneer
Session 4	*Maternal Mortality and Race*	Dr. Nathalie Feldman, MD
Session 5	*Vermont Racial Justice Alliance*	Guest speaker: Mark Hughes
Session 6	*Brave Spaces, Community Engagement, and COVID-19*	Guest speaker: Dr. Maria Mercedes Avila, PhD

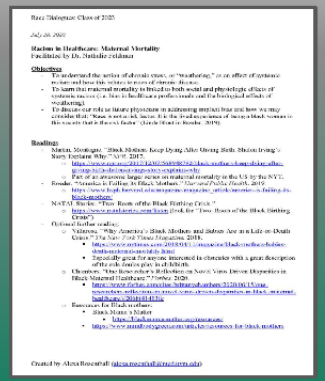

Figure: Example Session Guide

Results

Quantitative Analysis
- Weekly participants ranged from 12-35 persons.
- Data from the Race Dialogues Series post-survey indicated that 94.7% of participants (n=19) strongly agreed or agreed that medical schools should provide a forum to talk about race.
- Additionally, 94.7% (n=19) also strongly agreed or agreed that medical schools should integrate discussion of ethnicity and race throughout the curriculum.
- 100% (n=19) of participants strongly agreed or agreed that systemic racism occurs within the medical field.

Qualitative Analysis

Self-selection/Diversity of perspective:

"I wonder if there's anyway to make attendance required. There is such a self-selecting group of people that join. One of these sessions could also be integrated into Orientation. It would be such an important way to kick off medical school -- and start to open up with classmates early on. I would love to help on this front, if there is any opportunity."

Previous knowledge:

"Much of the material presented in the "Race Dialogues" was already familiar to me; however, I still found the sessions I participated in helpful because the discussion and perspectives of other students allowed me to reflect on these terms and concepts in a new way."

Value of peer conversations:

"I think always having the concepts in the back of my head as I interact with different people, whether that is patients, colleagues, or anyone else, will affect my relationships. Being aware of these concepts is not enough, and I hope to act in a way that allows me to make a positive impact through my interactions with people."

"Having the opportunity to speak with other students who had different perspectives and experiences to draw upon was valuable. I thought I could always conceptualize both sides of the spectrum, but the discussions helped me realize there were many more aspects along this spectrum that I had not considered."

Discussion

- This data indicates that students had a basic understanding of the intersection between race and medicine and understood the importance of having such conversations within medical school.
- Participants noted limited opportunities to engage in open conversations on race and racism in healthcare and were grateful for the opportunity.
- Limitations in survey participation led to inability to compare pre- and post-surveys and assess change in student viewpoints.
- It is imperative that medical schools across the country take steps to address the curriculum gaps relating to social determinants of health and racism in the preclinical years and beyond.
- After the events of 2020 regarding COVID-19 and the Black Lives Matter movement, the need for change in medical education is even more critical.
- The momentum to create this change should be recognized and acted upon.

Future Directions

- Create a sustainable model to continue the Race Dialogues at the Larner College of Medicine on a yearly basis.
- Better assess the change in student viewpoints from involvement in the Race Dialogues.
- Disseminate our lessons learned with other institutions to propagate more conversations surrounding social-determinants of health.
- Move towards integrating this material into the standard preclinical curriculum to grow effective citizen physicians, education regarding race, bias, and advocacy is essential in a medical education.

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What Information Resources do Students Use?

Analysis of Information Resources used in Convergence PBL

Jack Fitzsimons MS4, Alice Stokes MLIS, Laurie Gelles PhD, and Patricia King MD, PhD

Introduction

Convergence is a problem-based learning (PBL) course occurring in January of the second year, in which the students meet in small groups and work through seven clinical case problems. An important component of the PBL process is "self-directed" learning: students identify their knowledge gaps and formulate "case questions" to research outside the classroom and then return to present their findings to their peers. As they analyze and synthesize information relevant to addressing their questions, each student must assess the credibility of information resources and develop information seeking skills, a medical knowledge competency at LCOM.

Project

The resources students used to research Convergence case questions were analyzed in order to understand their information seeking skills and preferences at this point in their education.

EBM Decision Tree resources

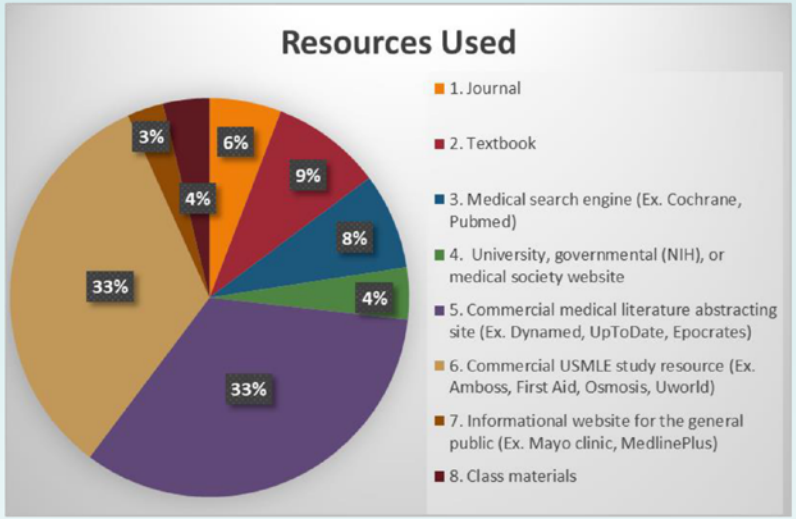
Background	Foreground	Public Health
• Textbooks • UpToDate • Class materials • PubMed - Review Articles • Micromedex • Epocrates • Prescriber's Letter	• Cochrane Library • Natural Medicines • UpToDate • VisualDx • CP Clinical Guidelines • Choosing Wisely • Guideline Central • TRIP • USPSTF • PubMed Clinical Queries	• CDC • VT Dept. of Health • Vermont 2-1-1 • CT Dept. of Public Health • CT Dept. of Mental Health • Danbury Dept. of Health and Human Services • Norwalk Health Dept.

Methods

At the onset of the course, students were given electronic tablets and received a presentation on information seeking skills. Students were introduced to the EBM Resources Decision Tree tool (https://www.uvm.edu/~dana/ebmtree/) to assist in identifying and locating appropriate information sources (see EBM Decision Tree chart). During the small group sessions and for each case question presentation, the students were asked to report the resources they utilized. These data were analyzed grouping the resources into 8 categories (see Resources Used chart).

Results

Resources data were collected from 15 groups of seven or eight students over seven cases. The group response rate over the seven cases was 65%. Overall commercial medical literature abstracting sites were cited most frequently at 33.5% of total citations, while commercial USMLE study resources were cited nearly as often at 33%. The remaining categories ranged from 3-9%.



Discussion

The high use of USMLE study resources is likely related to timing relative to taking USMLE step 1, and the students' regular reference to and use of USMLE Step 1 study guides during the course. The high use of highly abstracted resources such as UpToDate may reflect preference for quickly reviewed materials and familiarity with this resource. Information seeking skills should be evaluated at multiple times in the curriculum to evaluate competency development and identify opportunity for education intervention. Krasne et al. previously found that the provision of a resource matrix and librarian-guided workshops on locating authoritative sources "significantly increased citations to peer-reviewed journal articles and guidelines and decreased citations to general public Web sites and highly abstracted resources". Future work could include evaluating how resource utilization changes among students enrolled in Convergence after similar information seeking workshops. Additional work could also include how usage of USMLE study resources changes after Step 1 is changed to pass/fail in 2022.

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Beyond the Emergency Department: Perceived Effects of COVID-19 on Emergency Medicine Resident Education

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BACKGROUND

After the COVID-19 pandemic began in late 2019, many medical residents saw a rapid shift in their professional demands:

- Increasing numbers of patients infected with COVID-19[1]
- Decreased patient volumes[1]
- increased utilization of personal protective equipment
- Deviation from in-person education to virtual didactics[2]

OBJECTIVE

Determine the perceived effects of the pandemic on Emergency Medicine (EM) residents' educational experiences.

METHODS

Cross-sectional **Mixed-methods**
Survey Based

We administered a survey to Emergency Medicine (EM) residents at seven US programs, varying by length of training, geographical location, and local incidence of COVID-19 infections. We summarized quantitative data with comparisons of subgroups, and answers to open-ended questions were analyzed using the framework method to guide our inductive approach.[3]

ACKNOWLEDGEMENTS

We would like to thank Troy Madsen for his statistical expertise and Margaret Carlson for her efforts in research coordination.

Systems Experience

+
- Operational knowledge gained from participating in a disaster response
- Increased innovation
- Positive view of EM as a specialty
- More efficient hospital workflow and improved interdepartmental relationships

−
- Frustration with frequently changing protocols
- Changes to schedules or rotation cancellation
- Disruption in clinical workflow

Didactic Experience

+
- Experience with independent learning
- Increased convenience or flexibility with virtual didactics
- Inclusion of outside speakers with virtual didactics

−
- Less engagement with virtual didactics
- Decreased education in core content due to increased focus on the management of COVID-19
- Negative effect of virtual didactics on interpersonal interactions with colleagues
- Inability to travel to national conferences
- Decrease in simulation

Clinical Experience

+
- Increased knowledge and experience in the management of respiratory pathology
- Increased comfort with the implementation of infection control measures
- Increase in time available on shift
- Increased exposure to procedures and critical care for senior residents

−
- Frustration with protocolized restrictions on which patients provider could treat
- Limited experiences for junior residents
- Decreased patient volumes, clinical variety, and clinical acuity
- Decreased on-shift teaching opportunities
- Concern for the impact of anchoring bias

Wellness

+
- Increased time for residents to do things they enjoy
- Career affirmation
- Increased camaraderie and resilience

−
- Negative impact on mental health
- Frustration & discomfort related to personal protective equipment
- Concern for physical safety of self and close contacts
- Negative impact on social interactions
- Anxiety regarding future career implications

182 Responses included	5 Responses excluded	65% Report negative effect on their *education*	Junior residents disproportionately affected
45% Had a *rotation cancelled*	68% Report negative effect on their *wellness*	49% Report increased *career satisfaction*	More pronounced in areas with high incidence of COVID

Ford TR, Fix ML, Shappell E, et al. Beyond the emergency department: Effects of COVID-19 on emergency medicine resident education. *AEM Educ Train*. 2020. doi:10.1002/aet2.10568

CONCLUSION

We found mixed results of the pandemic on the EM residency experience with an overall negative effect on education, wellness, and clinical rotations, but an increase in satisfaction with EM as a career choice. This is further contextualized in our qualitative data analysis, highlighting the impacts of participants' systems, clinical, and didactic experiences during the pandemic in addition to the influence on resident wellness.

LIMITATIONS

These data examine subjective effects important to residents in the short term and do not explore long term or objective effects of the pandemic, an important area for future research. In addition, while we included residents from 7 institutions intentionally selected for diversity of training experience, these findings may not be generalizable to all programs.

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Wild Ortho Wednesdays: A Novel Online Curriculum for Multilevel Learners in Emergency Medicine

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Introduction

- Musculoskeletal complaints are common in the Emergency Department setting
- Many Emergency Medicine (EM) physicians are dissatisfied with their orthopedic training[1]
- Many providers and senior medical students have inadequate knowledge of common musculoskeletal conditions[1-3]

Description of Innovation

SUMMARY

- Online longitudinal orthopedics curriculum
- Targeted primarily for EM providers
- Case-based learning strategies[4]
  - Increased relevance for adult learners
  - Promotes learner inquiry

PLATFORM

- Wild Ortho Wednesdays (WOW)
  - Electronic mailing list
  - Weekly cases by email

CONTENT

- Image prompt and brief case presentation
- Questions relevant to ED recognition & management of specific condition
- Answers provided in the body of the email
  - Concise, high-yield format

Pilot Results

13	subscribers responded to pilot survey assessing impact
79%	of emails are opened
89%	of opened email content is reviewed
62%	of participants research a topic further after learning about it from WOW
100%	of participants report that WOW has changed their clinical practice

INPUTS	ACTIVITIES	PARTICIPATION	OUTCOMES

• Time
  • Authors
  • Peer-reviewers
  • Editors
  • Illustrators
  • Core team
• Distribution and team communication platforms
  • Google Groups
  • Gmail
  • Google Docs
• Case images
  • Original illustrations
  • Open-access content
	• Weekly emails
	  • Case-based
	  • Questions & answers
	  • Concise reviews
	• Repository of past cases
	• Training materials
		• EM providers
		• Medical students
		• Other providers without orthopedic residency training
		• Authors
		• Peer-reviewers
		• Editors
			SHORT
			• Increased learner inquiry & engagement
			• Increased orthopedic knowledge
			MEDIUM
			• Enhanced test performance
			LONG
			• Improved patient care
			• Better working relationships with orthopedic colleagues

Conclusion

While the implications of these results are limited by the small sample size of this pilot study, they suggest that WOW may be an effective tool to increase EM provider knowledge and independent investigation of clinically important musculoskeletal disorders. Further research is warranted regarding the objective effect of this curriculum on provider knowledge and retention of information.

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The Applied Practice Experience: Bridging distance education and in-person learning

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LARNER COLLEGE OF MEDICINE

BACKGROUND

The Applied Practice Experience (APE) bridges distance education and in-person learning. The APE is a required, 1-credit, 45-hour capstone course that encourages online Masters of Public Health (MPH) students to gain onsite, in-person, work experience. In their final semester, students identify a public health organization of their choosing to complete their APE. Under the supervision of the course instructors, students work closely with a Preceptor employed at their chosen organization to produce two final products that are of mutual interest to the student and the organization.

The chosen organization is typically near where the student lives or works but must be outside of their current professional role.

Typically, the APE is an on-site experience; students physically go to their chosen organization to complete the required hours of work experience. However, because many organizations have moved to remote work during the pandemic, the cohort of students in 2020 were primarily remote.

The purpose of this work is to demonstrate a model for combining in-person and remote learning strategies by analyzing reflections and feedback using qualitative data methods to identify successes and opportunities for future learning.

RESULTS

The "on-site" Experience

"...was an invaluable learning experience as both a public health student as well as a professional"

"The opportunity to work at a strategic level in the organization has increased my interest in further leadership, policy, and strategic direction as it relates to public health."

"This APE site influenced me going further with an MPH degree."

"I think APE is a great opportunity to experience a career in public health and build connections."

"The flexibility to apply and expand my MPH learnings to my current position was extremely useful and essential."

"I think the APE was an incredible addition to the MPH program because it provided me with a chance to connect my schoolwork in an open-ended way to my career."

Finding "on-site" Placements with Organizations

"I would recommend having a list of people interested in sponsoring students with projects already available that would be useful for their organization."

"I had a really hard time finding an APE experience and struggling for two months until I found one I settled into."

"Planning this APE site in the fall was very stressful because I didn't know what state I would be living in during the spring semester."

"I personally would have appreciated if UVM was able to match me with an organization, as opposed to have to connect with different folks on my own to pitch the unpaid preceptorship."

"It took longer than expected to find an internship site."

Time Commitment to the Course

"Finding the time within normal working hours to get to my APE site and meet with my preceptor was extremely difficult, as it is quite a burden to ask someone to meet and conduct work outside of normal work hours/days."

"Finding time to devote 20 hours to an on-site, in person internship is almost impossible for me."

"I found it a bit difficult to fully engage with this experience because I also had two other jobs concurrently with my schoolwork."

"I found it difficult to fit in an internship while working full time and working on my Master's degree"

APE Course Requirements

"I found it difficult to gather a thorough comprehension of what the APE should look and feel like"

"I struggled to understand the type of products that were expected, and it would have been helpful if there were more concrete examples online."

"I wasn't aware of this requirement until it appeared in my blackboard list of classes for fall 2019."

"Although it became difficult to devote as much time as I wanted to the products due to COVID-19, I am grateful for the amount of support and guidance from the faculty coaches."

Figure 1. Map of Potential APE Public Health Organizations

METHODS

We analyzed feedback from 43 students who completed their APE during Spring 2020, at the height of the COVID-19 pandemic. As part of the APE, students are required to complete a Reflective Writing Assignment. This assignment was the primary source of data for this work.

The Reflective Writing Assignment is a free-form assignment where students are asked to reflect on what their accomplishments during their APE, what they learned, how this experience influenced their professional or personal development plans, and what changes they would make to the APE.

Qualitative data analysis methods were used to identify major findings and relevant themes for measuring the success of this course. Specifically, all qualitative feedback was blinded, grouped by theme, and coded for analysis. Because of the small sample size, all coding was done manually without qualitative software.

DISCUSSION

Overall, students enjoyed the opportunity to gain "on-site" experience through the APE. The UVM MPH is entirely online and asynchronous; however, students seemed to enjoy the opportunity not because it was a change to online learning, but because it facilitated practical public health experience. Feedback on major challenges with the APE resulted in the following changes for the 2021 cohort:

Finding a placement with an organization. Beginning in 2021, students are provided with a list of potential organizations in map form. This allows students to identify organizations near where they live, while learning about different types of opportunities. Additionally, though the APE officially begins in the Spring, students are expected to begin preparatory work in the Fall. This allows students to have more time to identify an organization and actively plan for their APE.

Understanding the course requirements. Prior to the official beginning of the course in the Spring, students have access to a Fall Blackboard Page with the syllabus, course timeline, and description of assignments and dates. Future, the APE faculty team is working more closely with MPH student advisors to advertise and plan for the APE during their final semesters.

Finding the time to complete the required 20 hours on site. Students are encouraged to discuss time management with the course instructors and their Preceptors to ensure a successful and beneficial learning environment. In addition, the increased planning for the course will likely minimize this burden. Students will likely continue to struggle with this requirement.

CONCLUSIONS

The APE provides the opportunity for a valuable learning experience outside of the classroom.

This model may be applied to other disciplines, including medicine, to allow students to independently expand and build upon the knowledge gained in the classroom.

DISCLOSURES

The authors have no disclosures to report.

Personality and perceptions of online courses among students who chose and students who were forced to online learning

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Introduction

Online medical education may persist beyonsd the COVID-19 pandemic. Student perceptions of online learning have been shown to differ based on personality and motivation for online coursework.[1,2] Understanding these associations could assist medical faculty in preparing successful online curriculums.

We explored if associations between personality and perceptions of online learning differed between students who chose an online program and those who were forced to transition to online learning.

Methods

Three cohorts of students responded to validated survey instruments for personality type (Big Five Inventory, BFI [3,4]) and perceptions of online learning (Online Course Impressions, OCI [1]). All students were surveyed in Oct-Nov 2020.

- Master of Public Health (MPH, n=38): enrolled in a fully online program; only students in their first or second semester were invited to participate
- Medical student class of 2022 (co2022, n=33): forced to transition to online learning during the pandemic
- Medical student class of 2024 (co2024, n=45): expected some online learning due to the pandemic

Participant characteristics

MPH students were more likely to be 30 years or older, have more than 5 years of full-time work experience, and have taken an online class prior to their current program compared to co2022 and co2024. There were no significant differences in gender or marital status between cohorts.

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Results

Few significant differences in personality scores were observed between the cohorts.

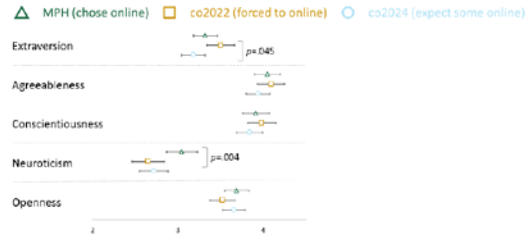

Figure 1: Mean BFI personality score by cohort, adjusted for age, gender, marital status, previous work experience, and previous online course experience (score range: 1-5)

Correlations

Significant correlations between conscientiousness and perceptions of online learning were observed among MPH students but not among medical students. Among co2022, extroversion and engagement in online courses were positively correlated.

Table 1: Correlations between BFI and OCI scores among MPH students

OCI dimension	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Engagement	0.01	-0.03	0.35 **	-0.25	-0.01
Value to career	0.09	0.05	0.37 **	-0.17	0.08
Overall evaluation	0.08	0.04	0.25	-0.31 *	0.10
Anxiety/frustration	0.04	0.11	-0.34 **	0.16	0.11
Prefer online	-0.12	-0.15	0.18	-0.01	-0.03

** Significant at $p<.05$, * Significant at $p<.10$

Significant differences in perception of online learning domains were observed between MPH and medical students. Fewer differences were observed between medical student classes.

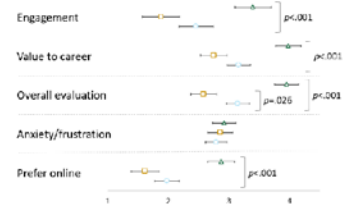

Figure 2: Mean OCI perception of online learning score by cohort, adjusted for age, gender, marital status, previous work experience, and previous online course experience (score range: 1-5)

Table 2: Correlations between BFI and OCI scores among co2022

OCI dimension	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Engagement	0.35 **	0.04	0.10	-0.15	-0.21
Value to career	0.13	-0.02	0.16	0.13	-0.25
Overall evaluation	0.24	0.11	0.12	0.02	-0.14
Anxiety/frustration	0.32 *	0.14	0.19	-0.19	0.10
Prefer online	-0.01	0.24	-0.13	-0.08	-0.15

** Significant at $p<.05$, * Significant at $p<.10$

Table 3: Correlations between BFI and OCI scores among co2024

OCI dimension	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Engagement	-0.14	0.02	-0.09	0.05	-0.12
Value to career	0.64	0.72	0.68	0.98	0.46
Overall evaluation	-0.17	0.02	-0.16	0.03	-0.18
Anxiety/frustration	0.19	-0.05	0.02	0.11	0.04
Prefer online	-0.18	0.03	-0.20	0.22	-0.19

** Significant at $p<.05$, * Significant at $p<.10$

Conclusions

Although personality scores were similar, significant differences in perception of online learning existed between students who chose an online curriculum compared to those forced to transition.

- Lack of correlations between personality and perceptions among medical students suggests that other mechanisms may affect their experience but more research is needed
- Stronger correlations among MPH students may exist because certain personality traits influence choice of an online program; medical students do not have this choice
- Transition to online for co2022 may have been particularly stressful because of the anticipated transition to clerkships

Our study includes some limitations:

- We could not control for the quality of online courses; MPH courses are intentionally designed for online learning
- Small cohort sizes may have limited our power to detect additional differences in personality and perceptions
- Although we controlled for key demographic factors, other differences in lifestyle and life circumstances between MPH and medical students may explain the observed differences

Future directions include exploring other mechanisms that affect medical student's online experience, understanding the faculty perceptions of the transition to online, and examining whether faculty perceptions may explain student perceptions.

Use of an online Q&A forum to enhance learning and community in an asynchronous quantitative class

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Introduction

Developing meaningful online learning communities is critical for student engagement and retention in asynchronous online courses.[1,2] This can present a challenge in quantitative classes due to the technical nature of the material.

We explored whether using an online discussion board as a student question and answer (Q&A) forum in an asynchronous epidemiology course had an impact on peer-to-peer learning and online community engagement.

Methods

Yellowdig™ is a social media-style online discussion platform that integrates with the Blackboard learning system.

We intentionally promoted using Yellowdig™ as a Q&A forum in an asynchronous graduate epidemiology class of 33 students. The Q&A forum simulated the "hallway conversations" that happen before or after an in-person class.

- Use of Yellowdig™ comprised 15% of the final course grade. Students did not have to participate specifically in the Q&A component, and could instead discuss any material relating to the course content.
- We highlighted the benefits of Q&A (quick response, peer-to-peer learning) at the start of and throughout the course
- Students were encouraged to collaborate on problem sets but not on quizzes, which were taken independently
- Students were encouraged to @tag the instructor in a discussion post for help as opposed to emailing

Statistical methods

We used linear regression to determine if asking and/or answering a question in the Q&A forum was predictive of final, problem set or quiz grades, controlling for overall discussion participation and previous coursework in the online public health program.

We compared community engagement metrics, including the average number of responses per discussion post and average number of discussion interactions per student, to the previous semester that used Yellowdig™ but not as a Q&A forum.

Results

Students actively used Yellowdig™ to ask and answer questions. Example posts:

Peer-to-peer learning

In fully adjusted linear regression models, answering a question in the Q&A forum was predictive of a significantly higher final grade and problem set grade, but not quiz grade.

After full adjustment, no significant associations were seen between asking a question in the Q&A forum or the number of questions asked or answered in the Q&A forum and course grades.

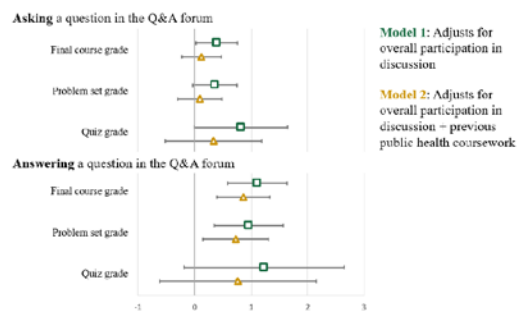

Figure 1: Adjusted difference in final, problem set, and quiz grades between students who did and did not use the Yellowdig™ Q&A forum to ask and answer questions during the semester

Community engagement metrics

Three community engagement metrics are identified by Yellowdig™ as primary indicators of student interaction and engagement.[3]

Each primary indicator improved significantly over the same course in the previous semester that used Yellowdig for discussion but did not promote a Q&A forum ($p<.001$).

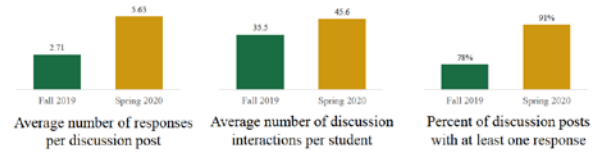

Figure 2: Key community engagement indicators, Fall 2019 and Spring 2020

Conclusions

In this case study of an asynchronous online epidemiology course, the use of a student Q&A forum may have conferred some benefit on assignments that allowed collaboration. However:

- Replication in other online quantitative courses is required
- Further replication among different instructors could isolate the specific impact of using the Q&A forum
- The study was underpowered to detect differences in grades using the number of questions asked or answered in the Q&A forum, which would give a more nuanced indication of impact

Community engagement metrics suggested a more connected online community than the previous semester. Subsequent investigations should consider a qualitative assessment of the students' perceptions of the Q&A forum. Anecdotal evidence from this case study appears positive:

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Virtual Peer Teaching in the Anatomy Lab

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Background

Previously, each class of first year medical students (N=124) at the Larner College of Medicine were split into dissection teams (N=20 with 6/7 students per team) for their anatomy dissections as part of the Foundations of Clinical Sciences (FoCS) curriculum. With this strategy, students performed only half of the course dissections. To transfer knowledge gained in the dissections in which they didn't participate, the 3/4 students who completed the dissection would teach their teammates about the anatomical structures they identified as well as information to assist in future recognition and pertinent facts about those structures (see figure below). Overall, this strategy enabled direct peer-to-peer teaching and provided an opportunity for students to learn from one another.

Motivation

Historical benefits of this approach included:
* An opportunity to teach/review the information reinforces the learning
* No single student feels overwhelmed by the requirement to teach others;
* Use of teams (blue/red) provides opportunities to work on team skills.

Historical drawbacks to this approach include:
* Lack of engagement of some students;
* Crowded and often noisy in the lab;
* Difficulty for faculty/TAs to visit all student groups to clarify any questions.

Due to the need to move the curriculum to a hybrid learning environment as a result of COVID-19, a virtual learning approach was developed for students to receive some of the benefits of peer teaching.

Peer Teaching

Peer teaching is defined as "the development of knowledge and skill through explicit active helping and supporting among status equals or matched companions, with the deliberate intent to help others with their learning goals" (1).
Utilizing a similar rationale, a peer-to-peer virtual teaching approach was established in which first year medical students were expected to share their anatomical knowledge with their fellow classmates.

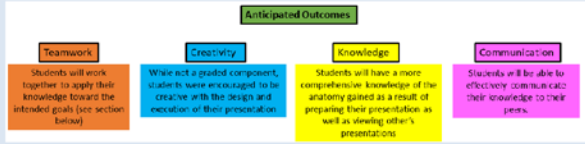
References and Acknowledgments

The author would like to gratefully thank Dr. Kathryn Huggett for advice on the project as well as leading the student focus group. The author would also like to gratefully thank Dr. Stephen Everse, the director of FoCS, for providing guidance on the setup of this new learning approach. Finally, the author would like to thank Dr. Eileen Cichoski-Kelly and Dr. Stephen Everse for critical review of this poster.

1. Topping K, Ehly S. Peer assisted learning: a framework for consultation. *J Educ Psychol Consult.* 2001, (12): 2113–2132.

Goals and Anticipated Outcomes

Establish a more effective and efficient means for students to teach and learn from one another.



Methods

Overview of Virtual Peer Teaching Setup

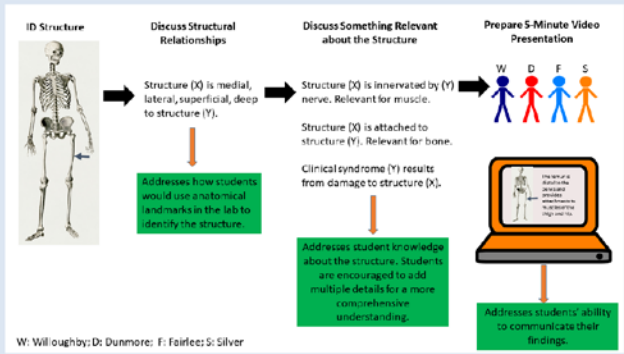
For ease of contact tracing should the need arise, the Office of Medical School Education split the first-year class into four communities (Dunmore, Fairlee, Silver, and Willoughby) of 31 students. Each community had at least one dissecting opportunity per Block.

*Thirty-two peer teaching groups consisting of 4 students each was established.

*Each peer teaching group had a member from one of the 4 communities. This allowed students from different communities an opportunity to meet and build friendships and it ensured that a member from each group had participated in each in-person dissection.

*Student groups were assigned 4-5 anatomical structures to label and discuss (see figure below).

*Cadaver-based images were provided for students to label.



The peer leader of each group was responsible for:
1. Creating a video presentation using Camtasia, software designed for creating video tutorials.
2. Uploading the video to Microsoft Teams.

All students were expected to review at least one peer teaching video/assignment and provide meaningful feedback to the members using a page dedicated to this in VicPortal.

Faculty were assigned 6-8 video presentations to review/assignment and utilized a grading template to provide feedback to student groups. Faculty and student feedback was posted in Teams." as that is what was actually done

Peer Teaching Topics and Student Performance

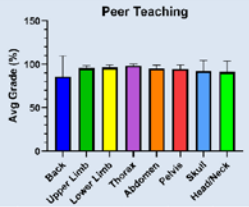
Students completed a total of 8 peer teaching exercises. These exercises accompanied each of the blocks during FoCS. See below the break down of the peer teaching assignments:

Topic	Block 2 Back	Block 2 Upper Limb	Block 3 Lower Limb	Block 4 Thorax	Block 5 Abdomen/Pelvis	Block 6 Head/Neck
Peer Teaching Assignments	1	1	1	1	2	2
Example Subtopics for Assignments	Superficial Back, Vertebral Column	Axilla Forearm Flexors	Gluteal Region Anterior Leg	Heart Superior Mediastinum	Gut Viscera Pelvis Anatomy	Skull Anatomy Orbit

Each structure that students were expected to identify in any block was included in the peer teaching assignment.

Students were provided with information on the groups and their assigned content so they could review any/all information they wished.

The data in the figure on the right represents averages from student group performance.



	Back	Upper Limb	Lower Limb	Thorax	Abdomen	Pelvis	Skull	Head/Neck
Average	86.2	95.7	96.4	98.5	95.3	94.8	92.5	91.4
SD	23.9	3.1	3.2	1.9	3.9	4.6	12.1	12.1

Preliminary Student Feedback

Several students indicated that they were spending hours re-doing their videos. Given these setbacks, we moved from a video presentation format to a power point presentation format in the mid-point of the course.

Six students participated in a virtual 45-minute focus session at the end of the course. Students were asked to provide feedback on the structure and learning opportunities from the peer teaching experience. Some major themes included the following:

Strengths:
1. Faculty care about student learning in the course.
2. Students appreciated faculty feedback on their work, but desired more of it.

Opportunities for Improvement:
1. Students felt that peer learning was most valuable in the lab environment.
2. Students were concerned with the accuracy of peer-provided information.
3. The timing of the peer teaching activities came too late in the block to have an perceived utility.
4. Students preferred submitting their materials on VicPortal as opposed to Microsoft Teams.
5. Students felt at times that the activity was more like busy work.

Future Directions

To address some of the concerns brought up by students, the following are improvements which can be implemented.

1. Accuracy of information being taught---students accomplish the activity with faculty involvement.
2. Peer teach in real time---students use cadaver-based images to teach their peers about structures they dissected.
3. Survey all students to determine whether anticipated learning outcomes were achieved.
4. Provide students with better training sessions/materials on the editing options of Camtasia.
5. Better communication to students on the importance of peer teaching.

SOCIAL DETERMINANTS OF HEALTH ROUNDS FOR OBSTETRICS & GYNECOLOGY CLERKSHIP

THE University of Vermont MEDICAL CENTER

UVMHealth.org/MedCenter

Department of Obstetrics & Gynecology, Robert Larner College of Medicine at the University of Vermont

PROBLEM STATEMENT

Can a model of "Social Determinants of Health (SDH) Rounds" improve medical students' ability to identify social determinants of health in a clinical context and propose system-based solutions?

BACKGROUND

Social determinants of health (SDH) are responsible for half of illnesses and play large role in patient wellbeing and in the health of communities[1]. Implementing curriculum about SDH into the clinical year enables future physicians to better identify social determinants and consider ways to improve the health system within which they work[2]. Currently, there is limited integration of these topics into clinical clerkships, including OB/GYN. The OB/GYN clinical clerkship presents a unique opportunity for students to see healthcare from several different perspectives, including the outpatient clinics, labor and delivery floors, inpatient wards, and operating rooms.

GOALS

1. Third year medical students can define social determinants of health.
2. Students can identify social challenges patients face in the clinical setting.
3. Students gain comfort identifying potential systems-based solutions to reduce social barriers to quality OB/GYN care.

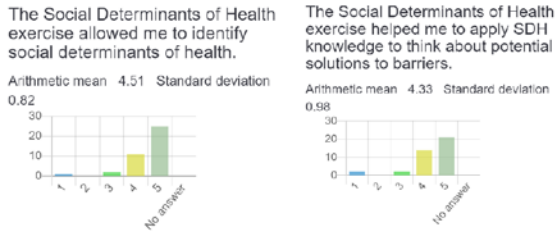
SOURCES

1. Hunter K, Thomson B. A scoping review of social determinants of health curricula in post-graduate medical education. Can Med Educ J. 2019
2. Importance of social determinants of health and cultural awareness in the delivery of reproductive health care. ACOG Committee Opinion No. 729. American College of Obstetricians and Gynecologist. Obstet Gynecol 2018.

STRATEGIES

- Brief pre-readings given to students defining social determinants of health.
- Students select one patient during their rotation who faced social barriers to receiving the highest quality of care.
- Students prepare a one-liner of the patient story, identify a social determinant, discuss what went right and what went wrong in the patient's care, and finally propose a systems-based solution to the barriers they observed.
- Cases are presented (5-10 minutes each) by each student during SDH "Rounds" via Zoom during the third week of the clerkship.
- Feedback survey is sent out immediately after rounds asking students to rate the importance of identifying social determinants, how effectively the activity helped them identify patients with social risk factors, and the impact of the activity on how they think about potential solutions to social barriers to care. All questions use a five-point Likert scale.

OUTCOME/IMPACT



LESSONS LEARNED

- 39 of the 44 students who participated in the curriculum as of December 2020 completed the feedback survey.
- Almost all students (97%) felt that understanding social determinants is important to providing quality health care.
- 92% of students agreed or strongly agreed that the rounds activity helped them to identify social determinants in practice.
- 90% of students felt the activity helped them to identify potential solutions to social barriers facing their patients.
- 79% of students recommended keeping SDH rounds in the OB/GYN clerkship curriculum.
- Creating small groups for discussion, scheduling sessions at convenient times, and reminding students about the activity were all important to student satisfaction.

DISCUSSION/NEXT STEPS

- Continue to refine format and timing of session to improve student satisfaction.
- Collect feedback for the remainder of the academic year and analyze results.
- Consider application of this format to other clerkships across Larner Med.

TEAM MEMBERS


Sidney Hilker, MS IV, Robert Larner College of Medicine


Jessica Chung, MD, PGY-2, Department of Obstetrics & Gynecology


Erin Morris, MD, Clerkship Director, Department of Obstetrics & Gynecology

A Discussion-Based Learning Session to Clarify Values Around Abortion

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The University of Vermont
LARNER COLLEGE OF MEDICINE

Background

- Abortion is a common medical procedure, with over 800,000 performed in 2017.[1]
- By the age of 45, 24% of women will have undergone an abortion.[1]
- Exposure to general abortion education during medical school is scarce at both the pre-clinical and clinical level.
- A 2005 study reported that 44% of OB-GYN clerkship directors at medical schools stated there was no formal abortion training or session in the preclinical setting and 23% reported none during the third-year clerkships.[2]
- It is ***imperative*** for medical schools to develop tools to educate students about this impactful procedure.
- This study aims to evaluate the effectiveness of a small-group session at providing access to educational materials and facilitating conversations about abortion.

Materials and Methods

- 90-minute small-group session
- Materials: Pre-session questionnaire, an abortion fact sheet, an article representing a "pro-life" stance, a personal essay about an abortion experience, and a post-session six-item Likert-type questionnaire
- Structure: 30 minutes to discuss readings and survey results; 45 minutes to discuss different clinical scenarios, patient stories and pregnancy lengths; and 15 minutes to debrief

1. This PCR session prompted discussions with classmates surrounding abortion care that I would not have had otherwise.

2. The session activities helped me to clarify my own attitudes toward abortion.

3. The structure of the session helped me to voice my true opinions.

4. I found it valuable to listen to my classmates talk about their opinions in this session

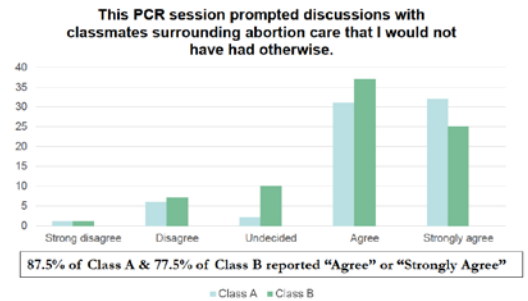
5. Abortion is an important topic to approach in PCR.

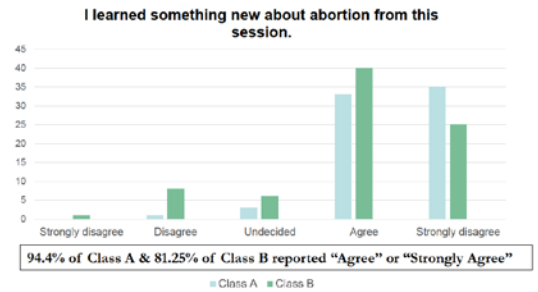
6. I learned something new about abortion from this session.

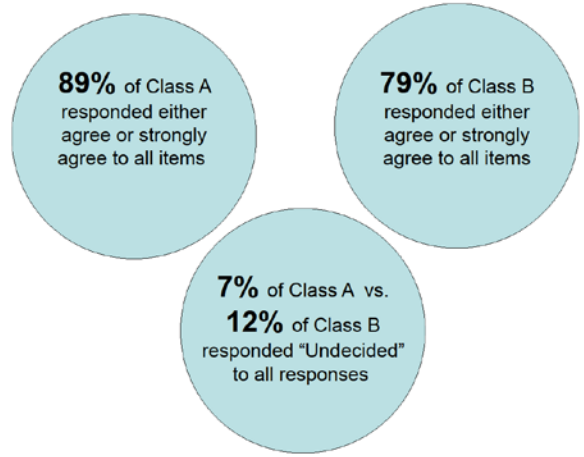
Post-session questionnaire. Responses correlated on Likert scale: 1=Strongly disagree; 2=Disagree; 3=Undecided; 4=Agree; 5=Strongly agree

Results

- Two first-year Professionalism, Communication, Reflection classes (Class A: n = 72; Class B: n = 80)







"I elected not to attend this session for personal reasons. But you should know that the readings alone had a tremendous impact on me. I learned things I wouldn't have known otherwise, which led me to some powerful personal realizations and empowered me to fully clarify my own beliefs and opinions personally and in my role as a clinician and advocate for my patients. I almost feel...uncloseted. It's a new feeling and I'm not sure what to do with it, but I'm grateful."

"It was one of the first times at Larner that I felt like I could actually voice my opinions without having to worry about offending someone, being judged, or assimilating to the values this school projects upon its students. It was refreshing to be able to actually have an opinion."

"In many cases, a person's spiritual beliefs presupposes any argument or statement about abortion. I think the curriculum did a great job of not debating the topic but simply examining the topic from 30,000 feet, allowing different viewpoints to converge at a very high level."

"Would have been nice to talk more about how abortion actually works (the procedure). It was hard to talk about things like whether you would or wouldn't perform abortions as a physician (question from the survey) if you didn't really know what that required."

"I wanted to hear more of the pro-life side. That perspective was absent in our group."

Samples of post-session comments.

Discussion

- Students overall responded **positively** to the session.
- Thus, **this is an appropriate method** to deliver objective information regarding abortion as well as to stimulate thoughtful discussion.
- It is important to note the political and cultural climate of New England when viewing the data, as application of this session in other regions might yield different results.
- Limitations:
  - Only two cohorts were included in analysis.
  - Questionnaires and session attendance were not mandatory which could have resulted in more homogenous responses.
  - Could not guarantee all sessions were identical or all exercises were completed.

References

1. Guttmacher Institute. 2020. *Induced Abortion In The UnitedStates*. [online] Available at: <https://www.guttmacher.org/fact-sheet/induced-abortion-united-states> [Accessed 18 April 2020].
2. Espey, E., Ogburn, T., Chavez, A., Qualls, C. and Leyba, M., 2005. Abortion education in medical schools: A national survey. *American Journal of Obstetrics and Gynecology*, 192(2), pp.640-643.

Active learning in the clinical years: Improving pediatric ECG competency through a novel PACE (Pediatric ACtive Learning Electrocardiography) module

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[1]The Larner College of Medicine at The University of Vermont; [2]Department of Pediatrics, UT Southwestern; [3]Division of Cardiology, Department of Medicine; [4]Division of Pediatric Cardiology, Department of Pediatrics

BACKGROUND

- Active learning (AL) improves academic performance and is the primary preclinical pedagogy at LCOM.
- Data are lacking regarding feasibility and efficacy of AL for clinical-level medical students.

PROJECT

- Evaluate AL for teaching pediatric ECG competency.
- LCOM medical students, faculty, and active learning team developed the 31-case module for learners enrolled in the LCOM pediatric cardiology elective (Figures 1 & 2).
- **Study Aims:**
  1. **Evaluate change in student ECG competency after using the PACE module.**
  2. **Assess learner satisfaction.**

METHODS

- 4th-year medical students and residents enrolled in pediatric cardiology (Aug 2020-Jul 2021) invited to participate (study design, Figure 3).
- Immediate ECG competency and sustained retention tested using 25 pediatric ECGs.
- Repeated-measures ANOVA and Wilcoxon rank-sum tests will assess ECG competency and user satisfaction, respectively.

PRELIMINARY RESULTS

- Enrolled students (n=4) and residents (n=5).
- Students demonstrate module completion during elective time (1-4hrs).
- Students positively review the module, consistently would recommend it to peers, and report case examples with interactive, real-time feedback as module strengths.

DISCUSSION

- Adapting AL to remote learning has become increasingly important during COVID-19 related educational disruptions.
- Study findings may offer insights about broader integration of web-based AL into clinical training.

The PACE module offers **online** and **asynchronous active learning** experiences during a **pediatric cardiology elective** and will help **evaluate student pediatric ECG competency**.

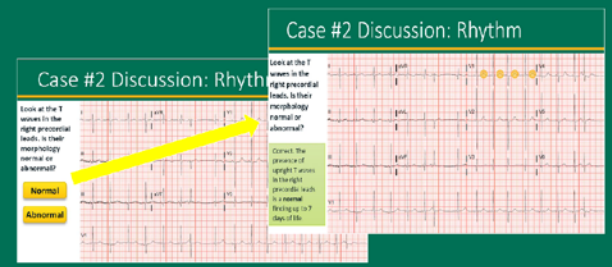

FIGURE 1. PACE Module Case #2: Example of a multiple-choice question with immediate feedback and instruction.

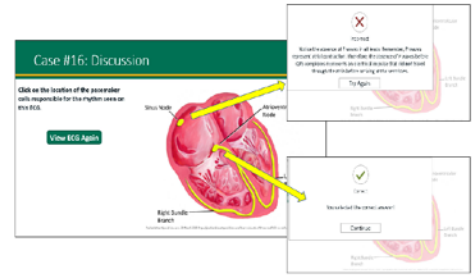

FIGURE 2. PACE Module Case #16: Example of a formative question to test learner knowledge and provide immediate feedback.

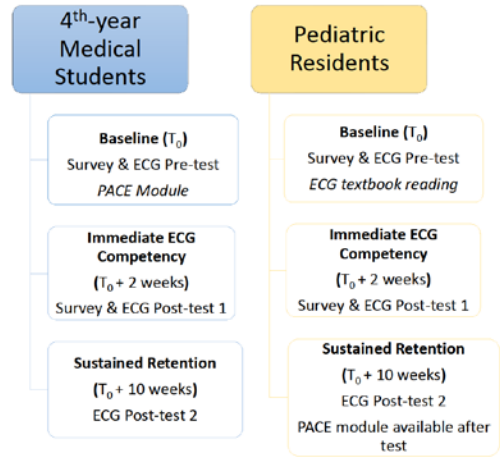

FIGURE 3. PACE Module Study Design: Participants complete 25-question ECG test at three time points, and LCOM students provide qualitative module feedback.

DISCLOSURES

This study was deemed exempt by the UVM IRB. This project is funded by a Teaching Academy Curriculum Development and Educational Scholarship Award, authors have no further disclosures.

Global Health Teaching Elective:
Creating a Reading Course for Senior Students Focused on Five Major International Health Themes

AM Kardys[1], CA Dawson[1], KP Thornburgh[1], A Frey[1], M McNamara[1], B Clements[1]
[1]Robert Larner MD College of Medicine at the University of Vermont

Introduction

- During the COVID-19 pandemic traditional global health trips have been suspended, leaving a gap for students wishing to receive exposure to global health during medical school.
- Originally chosen as international teaching assistants (TAs), fourth year medical students Amanda Kardys, Nina Dawson, and Trina Thornburgh were affected by COVID-19 and were unable to travel for their elective in July 2020. In the spirit of flexibility, they embraced the opportunity to safely explore global health through multimedia resources online for one month. At the end of the month, their goal was to share their new global health knowledge with other students through a novel reading elective.

Methods

- The three TAs met with their advisor, Dr. Benjamin Clements, virtually to discuss topics and create the structure of the course.
  - **Week One**: Discuss themes and narrow to five core themes
  - **Weeks Two-Three**: Each TA explored 1-2 themes through articles, podcast, YouTube videos, and multimedia interactive websites and presented the findings to the group
  - **Week Four:** TAs worked collaboratively on curating a succinct required reading list for week one of the elective, structuring the second week of the elective, and writing learning objectives
- In addition, in week four global health partners input on these themes was elicited to diversify the viewpoints on these topics. The partners were sent questions pertaining to each topic and asked to respond in written or video form. They were also encouraged to describe experiences with other pertinent global health topics.

Description

- As TAs, the three students created a two-week reading course for fourth year medical students at The Larner College of Medicine (LCOM) on five major themes of global health:

1. *Global burden of disease*
2. *Global health organizations*
3. *Ethics and impact of international aid*
4. *Access, health literacy and cultural context*
5. *Climate change*

- Of note, international health partners play an integral part in teaching these themes through pre-recorded lessons, as well as participating in in-person sessions when available.

Structure of Course

- In week one, enrolled students receive a preset reading list for one topic per day, video talks from global partners teaching on these themes, and a supplemental reading list. They then produce a one-page reflective essay per day on what they discovered about each theme.
- In week two, students apply what they learned about each theme to a specific area of global health such as women's health, mental health, or chronic diseases in global health. This application culminates in a 15–20-minute virtual presentation to other elective students and available global health partners.

Results

- The proposed two-week reading course curriculum was virtually presented by the three TA students on August 28, 2020 to LCOM faculty and international partners, where it was positively received. This confirmed the importance of this course and its link to international partners.
- The course was submitted to the LCOM medical curriculum committee (MCC) and was accepted. It will be offered during typical residency interview months. Students are currently signed up for January 2021.

Fig 1. A snapshot of Tendai Machingaidze, an international Zimbabwean partner, providing perspective on the concept of "Brain Drain"

- International partners submitted videos, as seen in Figure 1, with first-hand descriptions of their experiences with these topics.
- The effectiveness of the curriculum will be reviewed through evaluations provided by the medical students participating in the course, highlighting positive aspects of the course and areas where improvement is needed.

Discussion

- In this uncertain time, creating a virtual link to global health, enhanced by instruction from international partners, can prove vital for creating a foundation for future physicians' global health careers.
- Organizations such as the World Health Organization, World Bank, and Global Fund are important entities in global health which students are exposed to in this elective.[1]
- Students are challenged through this course to think of the ethics of clinical electives they participate in, and the impact they have on the international communities.[2]
- Limitations of this course include time-zone differences for working with international partners, no hands-on, in-person experience currently available, and motivation of participating students to engage with materials independently.
- When the pandemic and restrictions have lifted, this course can continue to be offered to students as an online elective because it builds a strong foundation without requiring travel. In addition, this curriculum has the potential to be integrated into the resources available to students who travel abroad in the future, giving them a better understanding of the context in which their experience occurs.

References

1. Clinton, C., Sridhar, D., & Sridhar, D. L. (2017). *Governing global health: who runs the world and why?*. Oxford University Press.
2. Holland, T., & Holland, A. (2011). *First, Do No Harm: A Qualitative Research Documentary.* [Video]. Vimeo. https://vimeo.com/22008886

Virtual Academic Detailing with Vermont Prescribers: A COVID-19 Inspired Educational Innovation

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OFFICE OF PRIMARY CARE & AHEC PROGRAM

Virtual academic detailing is similar to in-person academic detailing for self-reported satisfaction and behavior changes.

Academic Detailing Defined

- Academic detailing (AD) is one-to-one or small group continuing education for prescribers
- Over 100 randomized AD trials since late 1970s
- Educational focus is evidence-based prescribing and non-pharmaceutical care options
- Conceptual model is a blend of motivational interviewing and social marketing
- AD visits, or educational sessions, traditionally occur in community prescribers' offices
- Goal is to facilitate prescriber adoption of "key messages" or evidence-based behavior changes

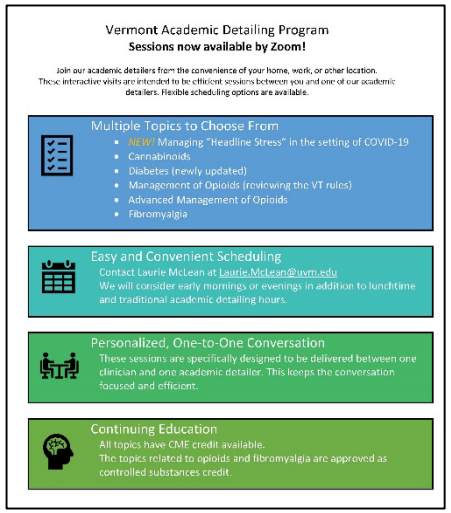
Vermont Academic Detailing Program

- Longest-running university-based AD program in the country, operational since 1999
- Target audience: VT primary care prescribers
- Funding support: State of Vermont; UVM Larner College of Medicine Office of Primary Care & AHEC Program
- Staffing: 2 physician and 3 pharmacist academic detailers plus administrative support
- Current topics: Management of Opioids, Fibromyalgia, Type 2 Diabetes, COPD, Cannabinoids

Educational Innovation

- In-person sessions suspended during the pandemic
- There are little data supporting a model of virtual AD
- In May 2020, AD transitioned to a virtual format, using Zoom software
- Virtual sessions were intended to maintain a similar format to in-person sessions
  - Sessions were between 30-60 minutes long
  - The same visual materials were used, except they were presented in PDF format rather than on paper
  - Participants were asked to complete an evaluation survey following the session (collected in Redcap for virtual sessions versus on paper for in-person sessions)

The objective of this evaluation was to compare in-person to virtual visits, with a hypothesis of non-inferiority between formats.



Example Promotional Flyer Emailed to Prescribers

Evaluation

- Survey data from virtual sessions delivered between May to October 2020 were compared to survey data for in-person sessions from May to October 2019
- Data were compared with a hypothesis of non-inferiority between formats using Fisher's exact tests

Results

Academic Detailing to Vermont Primary Care Prescribers

	May-Oct 2019 In-person	May-Oct 2020 Virtual
Sessions Delivered	61	98
Total Prescribers	274	265
Prescriber Evaluations	233 (85%)	88 (33%)

Comparison of In-person to Virtual Formats

	May-Oct 2019 In-person		May-Oct 2020 Virtual		
Evaluation Question	**N***	**(%)**	**N***	**(%)**	**P**
Would you be willing to attend a similar session in the future?	224/226	99.1	86/87	98.9	1.00
Do you feel the information presented will impact your practice/patient care?	214/217	98.6	87/88	98.9	1.00
Do you feel the information presented will impact your prescribing?	178/195	91.3	74/82	90.0	0.82

*The numerators indicate a "yes" response to the question.

Key Findings and Reflections

- A virtual AD format is non-inferior to an in-person format
- Although the number of prescribers who received detailing decreased slightly during 2020, the number of sessions increased. This demonstrates a shift towards more one-to-one sessions, which is the most evidence-based model of academic detailing.
- Teaching virtually required several adjustments:
  - Actively looking at the camera, rather than at the provider directly
  - Requesting all participants keep video on, to assist with reading body language
  - Starting all sessions face-to-face to establish a social connection, prior to screen-sharing materials
  - Establishing a back-up plan in case of technology failures

Advantages of a Virtual Format

- Easy to catch people up in a one-to-one session if they missed a small group session
- Less travel time for academic detailers
- Efficient and convenient for prescribers
- Potential for increased reach and capacity for more geographically distant practices

Limitations and challenges

- Low survey completion in virtual group (possible selection bias)
  - It is not known whether the low completion was due to the timing of survey administration, factors related to the format, lack of time by participants, or other factors. However several prescribers attended multiple sessions, strengthening the chances that prescribers are satisfied with the sessions but are not completing surveys for a different reason.
- Unable to access data on actual behavior changes
- Limited qualitative data to evaluate preferences for in-person or virtual formats

Conclusions and Next Steps

- Virtual academic detailing is a feasible and acceptable format for delivering this style of continuing education
- Future efforts must address the low post-session evaluation rate in the virtual group
- It will be important to understand educational preferences to better plan for which formats to offer in a post-COVID environment

Experience with converting Continuing Medical and Interprofessional Education to a virtual format during the Pandemic

John G. King MD MPH, Terry Caron MEd, Martha Allen, Mary Gagne, Sandra Gauthier, Kate Martin, Michele Morin, Karen Whitcomb, and Kristina Perry

Background

The COVID-19 pandemic shut down in-person Continuing Medical and Interprofessional Education (CMIE) at the Larner College of Medicine in March 2020. Seven large CMIE meetings were canceled, and all programming pivoted to video conferencing to continue its programing to meet the needs of practicing clinicians.

Methods

With the inability to have in-person conferences, directors of CMIE used prerecorded or live sessions on video platforms to offer education virtually. This study compares available results for the time period March through December of 2019 (prepandemic) to Marth through December of 2020 (pandemic) in a quasi-experimental pretest-posttest design. We compared numbers and types of conferences, attendance, and evaluations between these two time periods. A two tailed paired sample T-test was used to assess for significant differences. In addition, a qualitative thematic analysis was done of a course director survey completed in December 2020.

Results

Conversion to the virtual format for regular recurring series resulted in no change in number of hours of instruction presented or attendee hours (see Figure 1).

Core specialties directly treating the SARS C0V2 disease (Anesthesia, Emergency Medicine, Family Medicine, Medicine, Pediatrics, Pulmonary and Critical care, and Radiology) saw a large increase in attendance (see Figure 1).

Evaluations of conferences were not different between the time periods (Figure 2). A survey of 18 of 40 CMIE directors (response rate 45%) gave qualitative evidence for the success and future direction of virtual CMIE education and identified positive and negative aspects. (Figure 3).

Figure 1: Pre and Post Pandemic session numbers and attendees

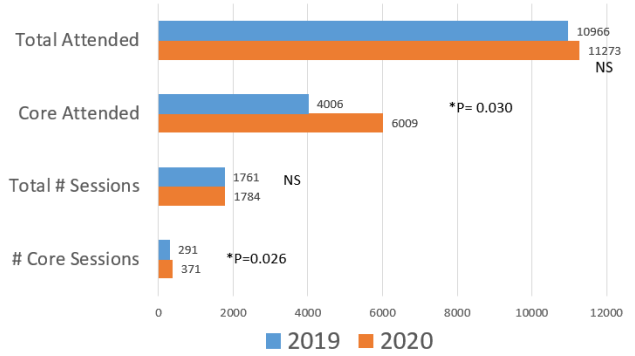


Figure 2: All Conference Evaluations

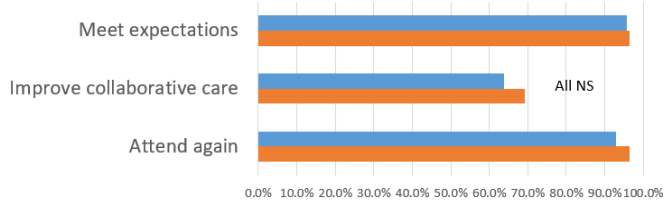


Figure 3: Thematic analysis of course directors survey

Feedback Thematic analysis

Positive themes	
# responses	
6	Higher attendance due to less travel, scheduling (OR, night, off-site), home, out of town
4	Wider geography of speakers due to less travel cost and time
3	Generally has worked well
2	Good opportunity for discussion/questions
1	Questions in chat could be answered asynchronously
1	Side discussions in chat
Neutral themes	
2	Information convenience (slides easily visible)
1	Conferences that were already virtual not affected
1	Discussion of tough topics
1	Sufficient
Negative themes	
1	Audience initiated discussion more difficult
1	Can't read the room
1	Confusing topics more difficult
1	Difficult or controversial topics more difficult
1	Harder to make interactive
1	Less support staff participation
1	Level of engagement and interaction less
1	Lost camaraderie
1	Technical kinks early on
1	"Zoom" fatigue

Future Direction	
4	Stay virtual
7	Hybrid
5	Back to all in-person
3	Virtual outside speakers

Discussion

In March 2020 the global pandemic necessitated suspension of all in-person CMIE conferences and meetings for 2020 and an increased need for continuing education directed at SARSCoV2. There were many canceled conferences and meetings. There was a rapid transition to all virtual meetings allowing for the presentation of the same number of conference hours and attendees during the pandemic as the previous year.

There was a significant 50% increase in attendance at core specialty conferences. The increased attendance can be attributed to the virtual format as shown in the thematic analysis of a survey of course directors. Another explanation for the increased attendance appeared to be content focused on the SARSCoV2 disease and social justice topics. There was a drop in attendance at some specialty conferences and meetings.

Other factors that could have affected attendance are the clinical and psychological stresses produced by the pandemic and regression to the mean since results were only compared from two time periods. The later is less likely as 2016-2018 had similar volumes as 2019.

Positive and negative themes emerged in a course director survey which may be helpful in planning for future CMIE events. Higher attendance, asynchronous questions, active discussions in the chat function, and ability to have outside speakers at a low cost were significant positives. Negatives included lack of camaraderie, some topics and discussions are more challenging virtually, and fatigue with the format.

Conclusion

Virtual conferences can provide a valuable alternative to in-person education in CMIE with comparable learner satisfaction. CMIE learners missed in-person interactions especially for complex, challenging topics. Most course directors felt that a virtual option will remain after the pandemic. Learner comfort with virtual platforms offers an opportunity for innovative active learning and

Infographics as a Means to Integrate Social Determinants of Health Principles into the Pre-clinical Medical Curriculum

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The University of Vermont
LARNER COLLEGE OF MEDICINE

All infographics generated with VENNGAGE

Abstract

We envision a healthcare system that promotes prevention of illness rather than purely relying on treating and curing disease. It is therefore imperative that future physicians are trained to identify and address the social factors that impact health. Despite the clear need for teaching the social determinants of health in pre-clinical medical education, integrating these principles into the curriculum continues to be a challenge. The University of Vermont's Larner College of Medicine has recently incorporated a "Social Medicine Theme of the Week" to acknowledge the specific ways social and economic factors influence health outcomes and contribute to persistent disparities within the health care system.

The aim of this project was to present these themes through online infographics to provide students with a resource to acquire foundational knowledge specific to social medicine topics. To create content that was both engaging and accessible, we utilized the infographic generator website Venngage. Each infographic integrated a social medicine theme that pertained to the basic science content taught that week. The body of the infographic included a summary of the topic along with visually enhanced representations of data (e.g., timelines, charts, statistics). In addition, embedded hyperlinks directed students to multimedia resources including podcasts, TED talks, documentaries, and recently published articles. Infographics were delivered to students as an independent learning session within their curriculum calendar.

Advantages of this format include the ease in accessibility and the ability cover a wide range of topics in an easily digestible manner. Because these topics evolve rapidly, this approach allows materials to be continually updated to reflect the most recent literature. This meaningful approach to teaching the social determinants of health is an important step towards inspiring the next generation of physicians to address inequities and actively work towards social change.

Introduction

The Social Medicine Theme of the Week was developed in 2018 when a group of student advocates at UVM Larner were concerned that their medical curriculum was not adequately addressing the Social Determinants of Health. These concerns drove this group, now known as the Social Justice Coalition, to create a Social Medicine Theme of the Week (SMTW) intervention as part of a larger Social Medicine Curriculum. For each week of the first and second years of the preclinical curriculum, this group developed a Social Medicine Theme with learning objectives connected to what was being taught in the foundational science curriculum.[1] The theme of the week was originally introduced through student led in-class announcements with learning objectives posted to the medical student calendar with other coursework. In March 2020, the curriculum delivery became fully remote in response to the nationwide Covid-19 pandemic. To adapt to the loss of in-class announcements, we formatted the theme of the week into infographic-styled newsletters. These newsletters included a brief introduction of the theme of the week as well as hyperlinks to variety of optional multi-media resources to encourage independent learning on the topic.

Methodology and Results

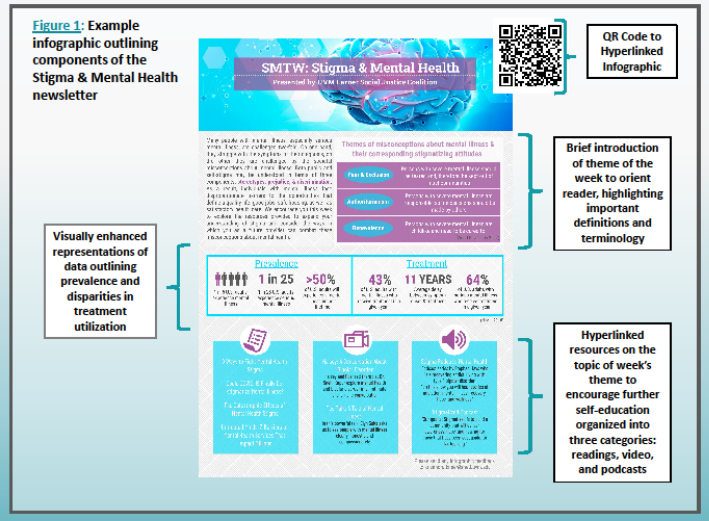

Figure 1: Example infographic outlining components of the Stigma & Mental Health newsletter

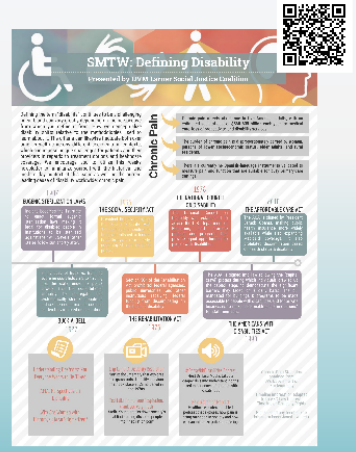

Figure 2: SMTW Defining Disability Newsletter
Newsletter focused on the historical context of disability rights in the United States including an abbreviated timeline of notable legislation along with spotlight statistics on chronic pain

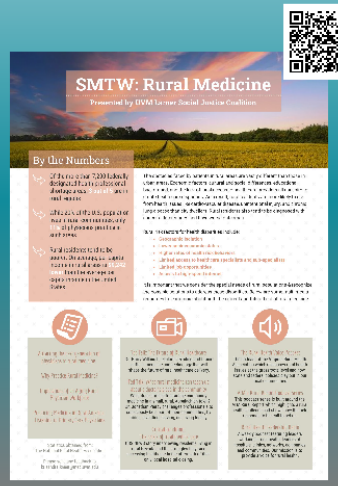

Figure 3: SMTW Rural Medicine Newsletter
Newsletter with statistics highlighting the shortage of health professionals in rural regions and the specific risk factors that contribute to disparities among individuals living in rural settings.

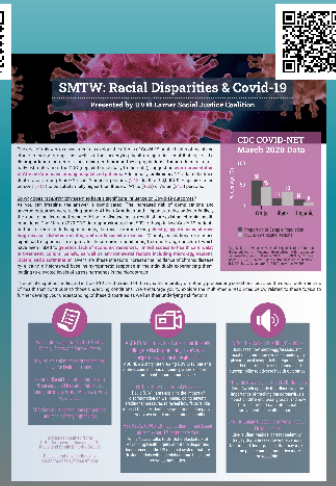

Figure 4: SMTW Racial Disparities & Covid-19 Newsletter
Newsletter with statistics highlighting the disparities seen in Covid-19, with data demonstrating the disproportional impact of adverse outcomes across minority populations.

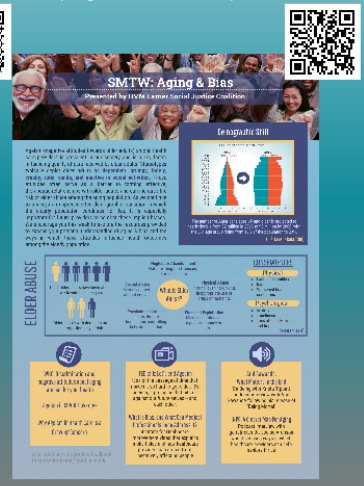

Figure 5: SMTW Aging & Bias Newsletter
Newsletter outlining the common stereotypes of older adults and the ways in which underlying bias contributes to elder abuse among the aging population.

Discussion

The use of infographics in higher education settings is becoming more and more prevalent as a tool to convey complex information in a manner that is both eye-catching and easily understood. A recent study assessing the effectiveness of this delivery method found infographics to be associated with higher reader preference and lower cognitive load.[2] This format also allows for rapid dissemination of information to the entire LCOM community. For example, when several evidence-bases resources revealed racial disparities in medicine related to Covid-19, we created and quickly disseminated an infographic of this evidence to both the students and faculty. Though we have not yet had the opportunity to evaluate our approach, the findings of other groups suggest that students will be more inclined to engage with the Social Medicine Theme of the week in a meaningful way when presented information in this manner. It is our goal that through this method of delivery, students will become better equipped to draw connections between social medicine topics and their coursework as well as inspired to address the social changes necessary to achieve health equity for all.

Future Directions

- Continue generating infographics until there is one to complement every Social Medicine Theme of the Week for the entire pre-clinical medical curriculum at UVM Larner
- Increase visibility of infographic resources to both students and faculty through collaboration with other UVM Larner resources such as the Library website and UVM Larner College of Medicine Blog
- Continue to expand this intervention with each entering Larner College of Medicine class with the goal of increasing student dialogue on the topics of social medicine and possibly expanding to Global Health topics
- Formal evaluation of student feedback on the utilization of infographics to introduce Social Medicine topics to determine effectiveness and worth of this intervention

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DEVELOPMENT OF LEARNING MODULES TO IMPROVE THE INFORMED CONSENT PROCESS

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Background

- Informed consent is defined as the "process of communication between a patient and physician that results in the patient's authorization or agreement to undergo a specific medical intervention."
- Informed consent is required for all major therapeutic treatments and diagnostic procedures where the disclosure of significant medical information, including the major risks involved, would assist the patient in making an intelligent decision whether to undergo the proposed treatment or procedure.
- Process is frequently insufficient leaving patients and physicians at odds
- Prior research has demonstrated that patient comprehension of the key elements of informed consent is often poor and physicians receive little training on how to carry out informed consent discussions.
- To seek to improve the informed consent process at UVMMC the current project was developed.

Identify important elements of informed consent as outlined in the UVMMC Informed Consent policy.

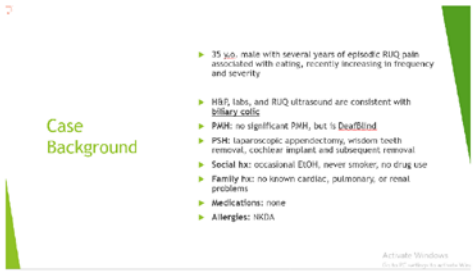
Understand the key tenets of the Informed Consent Policy.

Goals

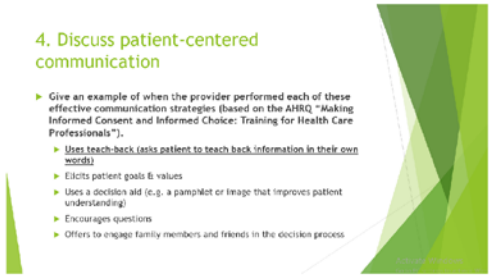
1. Evaluate current UVMMC policies and practices
2. Develop simulation based cases of the most common procedures performed and the informed consent process for these procedures.
3. Create simulated patient informed consent interactions and generate learning modules from these interactions.
4. Disseminate learning modules to physicians partaking in the informed consent process and evaluate outcomes following the intervention.
5. Improve patient satisfaction with informed consent process

Current Progress

- General surgery case, laparoscopic cholecystectomy, has been created along with corresponding standardized patient checklist.
- Checklist includes discussion points and practitioner interaction goals that must be met during the interaction



- Learning module PowerPoint with embedded interaction with Deafblind patient informed consent process has been created.
- Learning module has been reviewed by UVMMC committee working to improve informed consent process.



- Additional filming has taken place to provide "gold standard" practitioner with example of informed consent process

Next Steps

- Recruit physicians to partake in filming of proper informed consent process videos
- Create learning modules for Department of Surgery most common procedures and Department of Anesthesia most common procedures
- Disseminate learning modules to providers throughout UVMMC who partake in the informed consent process
- Evaluate effectiveness of learning modules as a tool to improve the informed consent process at UVMMC

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Active Learning for Budding Entrepreneurs: Lessons Learned from Going Virtual in 2020

Tina Thornton[1], Erik Monsen[2], Alison Howe[3], Mercedes Rincon[4] and Charles G. Irvin[1]

[1]University of Vermont, Larner College of Medicine, [2]University of Vermont, Grossman School of Business, [3]Geisinger Commonwealth School of Medicine, Medical Education, [4]University of Colorado Anschutz School of Medicine, Immunology and Microbiology

Motivation:

The growth of biomedical entrepreneurship within academia is driven by the desire of scientists to have their innovative, medically related discoveries benefit patients. Research scientists do not have the appropriate skills to translate their ideas into successful business ventures. This is particularly true in the Institutional Development Award program (IDeA)-defined states.

Approach:

The I-Trep program provides education and skills development in entrepreneurship to facilitate generation and competitiveness of start-up biomedical businesses and to foster economic growth in IDeA states. Our flagship offering is a intensive summer course in biomedical entrepreneurship.

Intensive Biomedical Entrepreneurship Summer Course Topics

Participating States

Participants

- 3 In-person cohorts 2017-2019 (n=51), Virtual Pilot (n=12)
- Wide range of career stage and business experience

Course Design

- Team-based and organized by participant technologies
- AM Lecture>Expert Seminar>PM Team work
- Teams give final pitch and receive outside expert feedback

Evaluation

- Pre/Post course surveys
- Retrospective survey (74% response rate) and then selected interviews (37%)

Outcomes

- Retrospective feedback was highly positive: 94% found the course to be applicable to their careers; 86% rated it as very good or excellent; 91% reported the course helped to provide foundational knowledge and develop skillset in biomedical entrepreneurship

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Experimental Virtual Course

- Opportunity to pilot virtual course due to the pandemic
- Recruited participants (n=12)
- Retained AM Lectures and afternoon Seminar with experts
- Asynchronous team work was expected to allow learner flexibility

Lessons Learned

- Similar to our in-person course, participants reported an increase in confidence as an entrepreneur
- Comments however indicated issues/shortcomings with the virtual format:
  - Time spent in lectures took away time for team work
  - Range in experience was challenging
  - Difficulty in engaging with the course materials in such a short timeframe

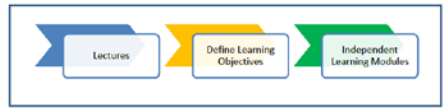
Conclusions

- ❖ **Overall, the team-based active learning provided is very effective with this unique set of learners**
- ❖ **The virtual delivery of the course is possible but it must be redesigned to optimize the use of Zoom time**

Contemplated Course Redesign

- Focus on beginner level of experience
  - ➢ Convert past course technologies into Technology Portfolio

- Convert lectures to independent learning modules



- Convert from a daily schedule to a weekly one to allow participants to have more time to engage with the course material and prevent Zoom burnout
- Each week will include the independent learning modules, individual assignments, group assignments (limit to three hours Zoom time)

"MS4 Report": A Student-led and Remote Model for Case-Based Learning In Preparation for Residency

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INTRODUCTION

- The arrival of COVID-19 within the United States prompted unprecedented changes in medical education due to the pause in medical student clinical rotations
- Medical students required new outlets to practice advanced clinical reasoning skills outside of traditional clinical settings
- While students are frequent attendees at resident case conferences such as "Morning Report," there are few known initiatives which teach students to design and present case conferences themselves

LEARNING OBJECTIVES

1. Participants will gain comfort with forming a broad differential diagnosis for a given clinical presentation
2. Participants will feel more engaged in their medical education
3. Participants will gain comfort with contributing to a case discussion
4. Presenters will gain comfort with preparing a case presentation
5. Presenters will gain confidence leading a case-based discussion
6. Presenters will gain confidence communicating learning objectives

EXAMPLE PRESENTATION

METHODOLOGY

- Fourth-year medical students volunteered to virtually present real clinical cases over 1 hour to a group of their peers and to guide clinical discussion and learning
- 1 general internal medicine faculty member mentored each student in presentation design to ensure effectiveness of delivery and teaching points
- 2 medical student leaders coordinated student presenter sign-ups and provided technical and logistical support
- 1 Invited faculty discussant per case provided expert input and clinical pearls throughout the presentation
- Educational quality measured by feedback survey upon series completion using a standard 1-5 Likert scale

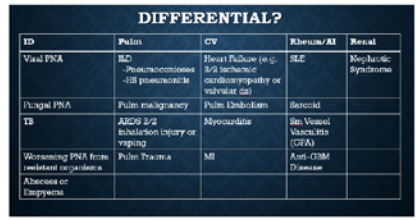
Presenting team during each session

RESULTS

- 7 presentations scheduled on a weekly basis from April to May 2020, delivered with Microsoft PowerPoint on the virtual platform Zoom
- Session topics included differential for dyspnea, anemia workup, liver disease, emergency medicine decision-making, neonatal resuscitation, and a morbidity and mortality discussion
- Attendance ranged from 2 to 11 attendees (mean 6.57), excluding student coordinators and presenters

Quality Measure (n=9[a])	Average agreement on a standard 1-5 Likert Scale, 5 indicating strongly agree (SD)
Increased comfort with forming a broad differential	4.2 (0.44)
Feel more engagement in medical education	4.4 (0.53)
Increased comfort contributing to a case discussion	4.3 (0.71)
Preference for the student-led format of MS4 Report over the resident-led format of other conferences	3.8 (0.83)
Interest in participating in a similar activity in student's intended specialty of practice	4.7 (0.5)
Enough variety among MS4 Report cases	4.3 (0.71)
ZOOM as an effective delivery platform	4.6 (0.53)
Presenters Only (n=4[b])	
Increased confidence in ability to prepare a case presentation	4.5 (0.58)
Increased confidence in ability to lead a case-based discussion	4.5 (0.58)
Increased comfort with clinical content presented	4.0 (0.82)

[a]Average number of MS4 reports attended 4.1 (2.3), [a,b] Student administrators excluded



Sample teaching slide from a student presentation

DISCUSSION

- The MS4 Report model may improve students' abilities to prepare and deliver a case conference presentation with faculty mentorship in preparation for residency
- Attendees collectively indicated increased comfort with forming a broad differential diagnosis, developing assessments and plans, increased engagement in their medical education, and increased comfort with contributing to a case discussion
- Limitations include small sample size, short duration of study, and selection bias, considering participation was voluntary
- Additional research may enlighten the role similar programs may play in a post-COVID medical education curriculum

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ACKNOWLEDGEMENTS

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Development of the Partnering Guide to Educate Clinicians in PCOR/CER

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BACKGROUND

Patient-centered outcomes comparative effectiveness research (PCOR/CER) requires direct inclusion of new partners on research teams.

A current PCOR/CER study, Integrating Behavioral Health and Primary Care (IBH-PC), engaged patient stakeholders in developing a Patient Partner Guide (PPG) to advise and support inclusion of patients on quality improvement teams.

OBJECTIVE

Adapt and trial the IBH-PC PPG to educate ALL stakeholders (clinicians, researchers, patient partners, others) in reciprocal relationships, equity, trust and partnerships in teams.

METHODS

Engage stakeholders in three online, team-based tools:

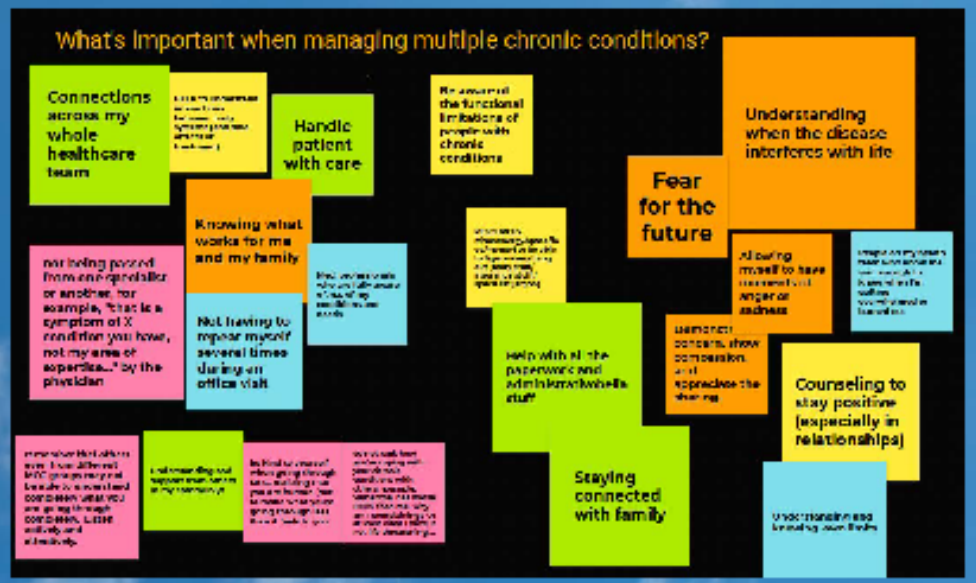
Affinity Diagram Exercise

Callout Production Process

Appreciative Response Process

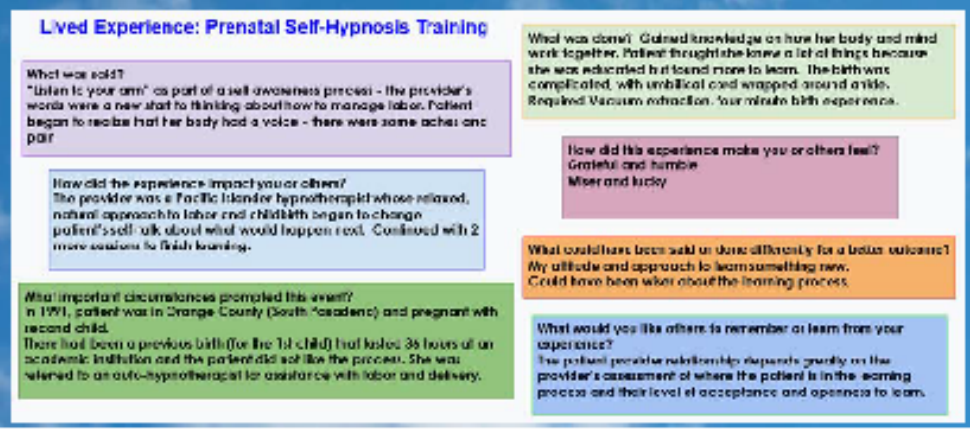
AFFINITY DIAGRAM EXERCISE

Share understanding of what matters most to patients



CALLOUT PRODUCTION PROCESS

Highlight lessons to be learned from lived experiences



Results to Date

Using **Appreciative Response Process** to solicit feedback & collaboration has been successful in developing a Partner Guide in PCOR/CER

Currently recruiting Clinicians, Practice Members, Patients, and others to trial tools and methods

All will engage in:

- Reciprocal Relationships
- Shared Experiences
- Shared Learning
- Collaboration

JOIN US!

cvaneegh@med.uvm.edu

This work was funded through a Patient-Centered Outcomes Research Institute (PCORI) Award (PCS-1409-24372). The views, statements, and opinions presented are solely the responsibility of the authors and do not necessarily represent the views of PCORI, its Board of Governors or Methodology Committee.

The Impact of a Preclinical Medical Student Mentored Summer Research Experience in Cardiovascular Disease on Scholarship and Career Trajectory: A Six-Year Report

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The University of Vermont LARNER COLLEGE OF MEDICINE

Cardiovascular Research Institute of Vermont

BACKGROUND

- Developing a sustainable preclinical training infrastructure for future cardiovascular clinician-scientists is a priority.
- While more medical students are participating in research during school, data suggest research career interests diminish by graduation.
- ***We studied the impact of a mentored cardiovascular summer research fellowship (SRF) on medical student scholarship and***

PROJECT DESCRIPTION AND METHODS

- Six-year study, competitive SRF: implemented by the Cardiovascular Research Institute of Vermont (CVRI-VT) at the University of Vermont Larner College of Medicine (LCOM).
- SRF: merit-based selection, mentored research experience between LCOM first and second year (**Figure 1**).
- Survey of all SRF awardees (2015-2020): current position, research engagement, SRF experience.
- Comparisons to national American Association of Medical Colleges Graduation Questionnaire (GQ) data from equivalent years were made using chi-squared tests.

RESULTS

- Survey **response rate: 87%** (20/23); 55% female, 80% white. Older cohort age at graduation, compared nationally (p<0.0001).
- Median time from SRF completion: 2.0 years (IQR 0.75-2.25).
- ***45% had published a peer-reviewed abstract or manuscript, equal to the national rate for graduating students (53%, p=0.47; Figure 2A).***
- **75%** were still enrolled in medical school.
- **80%** were involved in other research projects during medical school.
- **90% anticipate a career involving research (vs 53% nationally, p<0.001; Figures 2B-C, Table 1); 75% plan to pursue a career in cardiovascular medicine.**
- Participants identified valuable SRF experiences:
  - Mentorship (80%)
  - Research stipend (75%)

CONCLUSIONS AND NEXT STEPS

- LCOM students who completed a cardiovascular SRF after their first year **anticipated careers in cardiovascular research and published equivalent to the national rate for graduating peers, *even though the majority had yet to graduate.***
- Longer-term SRF study is needed to understand the impact of preclinical mentored research experiences on clinician-scientist scholarship and academic career performance.

LCOM students completing a ***cardiovascular summer research fellowship*** after their first year ***publish at the national average for graduates*** and ***anticipate careers in research.***

Figure 2. SRF Scholarship and Career Planning

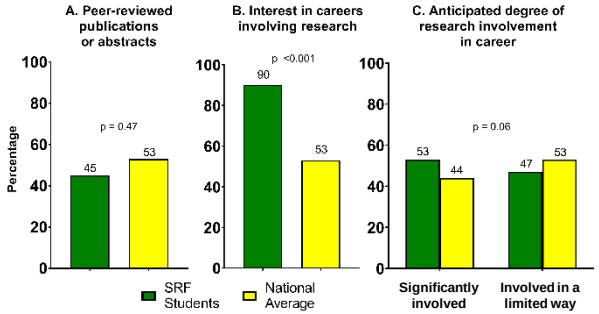
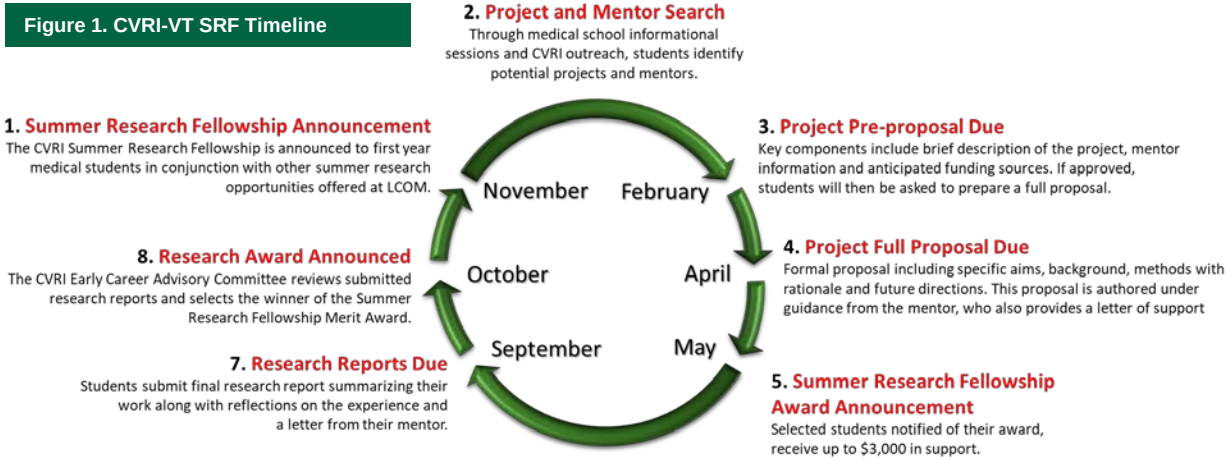


Table 1. SRF Career Interests, Mentorship & Scholarship

	Survey responses (%)	National average (%)	p value
Participation in other research projects during medical school unrelated to SRF	16 (80)		
If in residency, participating in research	3 (60)		
Awarded grants/funding related to SRF	6 (30)		
Research award or honors	6 (30)		
Future career interests:			
Patient Care	19 (95)	97	0.60
Research	18 (90)	53	**<0.001**
Teaching	17 (85)	83	0.81
Medical school faculty	13 (65)	45	0.07
Public health	6 (30)	29	0.92
Administration	5 (25)	28	0.77
Military service	0 (0)	4	0.36
Other	0 (0)	3	0.43
Satisfaction with mentoring during SRF:			
Very satisfied	15 (75)		
Satisfied	5 (25)		

Figure 1. CVRI-VT SRF Timeline



DISCLOSURE INFORMATION

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Updating Pediatric Morning Report: Increasing Educational Quality and Satisfaction among Residents and Faculty

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BACKGROUND

- Morning report (MR) is a case-based conference commonly used in resident education.
- Recent studies highlight participant dissatisfaction with MR educational value; at UVM Children's Hospital pediatric residency program, residents and faculty were also dissatisfied.
- Utilizing educational theory and quality improvement (QI) science we created a new standard MR educational process (intervention), with the **global aim to increase pediatric MR quality and participant satisfaction.**

INTERVENTION*	
5 required checklist elements	(1) Objectives (2) Take home points (3) Alignment with American Board of Pediatrics content specifications (4) Primary literature (5) Review question
Formalized resident-faculty mentorship	Assigned faculty mentor responsibilities: (1) Review presentation before MR (2) Attend MR (3) Provide feedback after MR
Feedback Form	Filled out by faculty mentor, co-resident, and chief resident

* adapted to virtual format in due to COVID-19 pandemic

METHODS

- Pediatric residents and faculty were surveyed at baseline and 6 months post-intervention.
- Standardized feedback forms completed after every MR, and tracked using QI run chart.
- Mixed effects logistic regression was used to compare pre- and post-intervention survey responses.

RESULTS

- Resident response rates: 90% (18/20) baseline and post-intervention.
- Faculty response rates: 66% (51/77) baseline, 44% (34/77) post-intervention.
- 17 MRs during study period: Jan-June 2020.
- Sustained increase in MR checklist adherence (Figure 1).
- Statistically significant improvement for majority of MR quality and satisfaction measures for both residents and faculty (Figure 2).
- Participation and mentorship processes were clear (Figure 3) and utilized (Figure 4).
- Intervention: did ***not*** 1) increase time burden for residents and faculty (Figure 5); 2) negatively influence pediatric board exam pass rate.

DISCUSSION

- Standardizing the MR educational process improved pediatric MR quality and satisfaction for residents and faculty.
- Ongoing QI science will be used to refine the MR process, focusing on feedback satisfaction and program sustainability.
- Future studies are needed to evaluate effects of standardized pediatric MR on resident teaching skills and educational outcomes.

LIMITATIONS

- Small single center pediatric residency program.
- Lower faculty response rate compared to residents.
- Mid-project transition from in-person to remote learning due to COVID-19.

Standardizing the pediatric morning report educational process increased quality and satisfaction for residents and faculty.

FIGURE 1. MR CHECKLIST ADHERENCE (OUTCOME MEASURE)

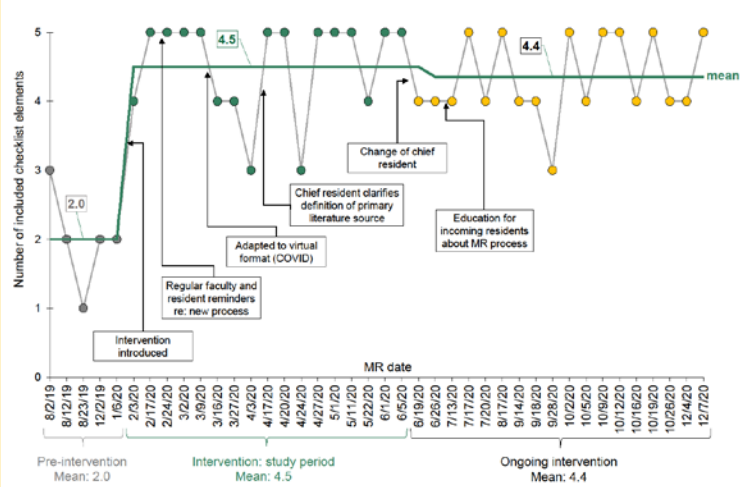


FIGURE 2. MR QUALITY AND PARTICIPANT SATISFACTION (OUTCOME MEASURES)

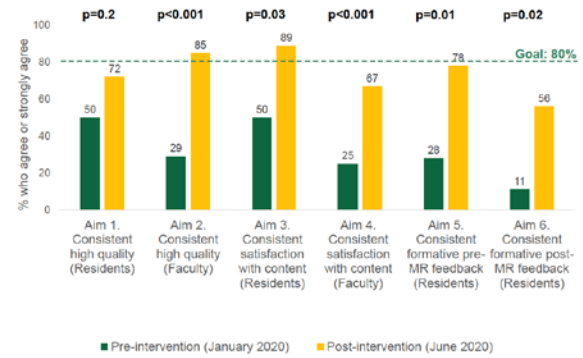


FIGURE 3. INTERVENTION CLARITY (PROCESS MEASURES)

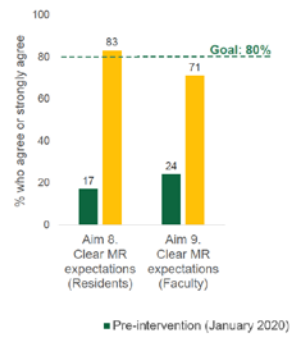


FIGURE 4. UTILIZATION OF MENTORSHIP (PROCESS MEASURES)

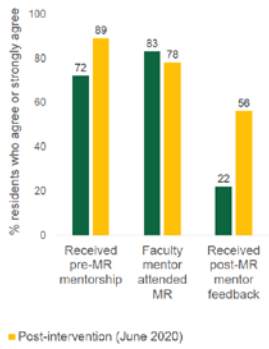
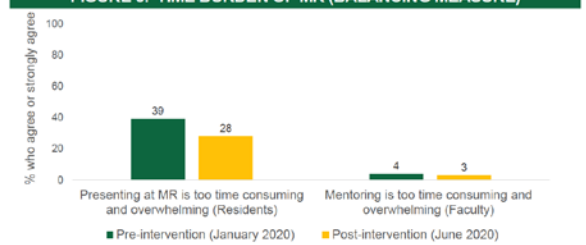


FIGURE 5. TIME BURDEN OF MR (BALANCING MEASURE)



DISCLOSURES

The authors have no disclosures to report.