

VIRTUAL ROOM I POSTERS

Faculty Moderator: Marisa M. Clifton, MD

Poster 1: Medical Student Clinical Skills Confidence and Procedural Exposure in the Neurology Clerkship: Comparison of Experiences Before and After COVID-19

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Background: National Neurology clerkship guidelines emphasize the importance of procedural skills, including completing histories, neurologic exams, and presentations, and performing lumbar punctures (LPs). However, it is unknown whether students gain exposure and confidence in procedural skills during the Neurology clerkship and how the COVID-19 pandemic may have affected their experience.

Aims: We aim to: 1) understand students' concerns related to procedural skill experience in the setting of COVID-related clerkship changes; 2) assess whether clerkship students gain confidence in Neurology clinical skills, both pre- and post-COVID; 3) quantify the proportion of students exposed to various procedures.

Methods: Johns Hopkins Neurology clerkship students between 11/2019-10/2020 completed pre- and post-clerkship surveys to assess confidence (on a scale from 1 to 5) in three clinical skills (history-taking, exams, presentations). Post-clerkship surveys also investigated procedural exposure. We used paired t-tests to evaluate differences in confidence pre- vs. post-clerkship for each skill. Students in an interdepartmental orientation (05/2020-07/2020) were surveyed regarding concerns about procedural skills in the setting of clerkship changes.

Results: Among orientation survey respondents (n=140), the majority were concerned (mean concern 3.46 out of 5) they may lack adequate procedural skills exposure due to COVID-related clerkship changes. Additionally, 82.9% anticipated neurologic examinations would be most difficult to learn, relative to history-taking and presentations, due to clerkship changes. Among both pre-COVID (n=40) and post-COVID (n=43) respondents, there were significant increases in confidence performing neurologic examinations ($p<0.05$), obtaining neurologic histories ($p<0.05$), and delivering oral presentations ($p<0.05$) after the clerkship. Regarding procedure participation pre-COVID (n=44), 81.8% had exposure to at least one procedure and 68.2% to LPs specifically (20.5% observed, 36.4% assisted with, 11.4% performed LPs under supervision). Among post-COVID respondents (n=55), 90.9% had exposure to at least one procedure, including LPs (70.9% overall; 36.4% observed, 25.5% assisted with, 9.1% performed under supervision), EMG/NCS (20%), and NG tube insertion (12.7%).

Conclusion: Despite students' concerns about developing clinical skills in the post-COVID era, we continued to see significantly improved confidence in three key clinical skills after the Neurology clerkship. Most students had exposure to at least one procedure and gained experience with LPs, both pre- and post-COVID.

Poster 2: Implementing an In-Person Simulation-Based Training Workshop for Critical Care Workers in Pakistan After the First-Wave of COVID-19

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Background: The COVID-19 surge in Pakistan revealed apparent deficits in the availability of qualified critical care staff. This led to an increased investment in deploying a multitude of educational interventions to train various categories of healthcare workers in the critical care setting. According to the Inclusive Index of 2020, only 35% of Pakistan's population has internet access. Therefore, Aga Khan University developed a novel hands-on workshop to expand the cadre of critical care workers.

Objective/Aim: To expeditiously train healthcare professionals in Pakistan in the management of COVID-19 patients through a combination of didactic lectures and simulation-based workshops. Methods: 76

participants affiliated with 30 hospitals across Pakistan underwent two-day intensive in-person courses consisting of case-based lectures and twelve hands-on sessions. This workshop focused on the basic principles of diagnosing, managing, and monitoring COVID-19 patients. All participants completed pre- and post-tests consisting of 30 multiple choice questions. Evaluation forms were also disseminated to all the participants to assess the workshop in terms of course content, duration, and methodology.

Results: The course participants were predominantly males (80.0%), with medical officers (51.9%), and postgraduate residents (15.2%) representing the largest groups. Majority (21.1%) had a background in internal medicine. Most (36%) had >5 years of experience. While the mean pre-test score was 11.25 ± 4.09 (37.50%), the post-test score showed a significant improvement with a mean of 15.41 ± 5.04 (51.34%) ($p < 0.0005$). All participants completed the feedback form, where 91% felt that they will be able to use the skill-set and knowledge acquired during the workshop, 96% expressed that they would recommend this workshop to their colleagues, and 84% indicated that the mode of teaching was conducive to learning.

Conclusion: Our results indicate that there is a dearth of baseline knowledge in critical care, highlighting the need for dedicated educational interventions in this field across Pakistan. The significant improvement in knowledge proves that such a model can be used as a prototype to implement future investments into training critical care workers. This study is currently being used to develop a similar workshop aimed at critical care nurses and paramedical staff.

Poster 3: Assessing Medical Student Exposure to Surgical Procedural Skills During COVID-19

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Background: The Coronavirus (COVID-19) pandemic has led to multiple curricular changes within the Johns Hopkins Surgery Core Clerkship. Specifically, shortening the clerkship to 6 weeks decreased the amount of dedicated time available for students to practice their clinical skills. It is currently unknown how these changes will impact students' ability to gain exposure to, and confidence in, certain core surgical skills.

Aims: This study aimed to characterize medical students' perspectives on the potential impact of COVID-19 on procedural skills exposure, and to determine whether students in the Surgery Core Clerkship were able to gain exposure to, and confidence in, specific core procedural skills in the midst of the pandemic.

Methods: Johns Hopkins medical students enrolled in the Surgery Core Clerkship between 07/2020 and 12/2020 completed post-clerkship surveys to assess concerns regarding the potential impact of COVID-19 on clinical experiences. Additionally, we assessed students' exposure to a variety of procedural skills, with a particular focus on four primary skills: closure of surgical incisions through suturing or stapling, foley catheter insertion, administering dressing changes, and removal of surgical drains.

Results: Of the 67 students enrolled in the Surgery Core Clerkship, 61.2% ($n=41$) completed the post-clerkship survey. 48.8% of students reported that procedural experience was "very important" in helping them decide on a future specialty. Additionally, 31.7% of students were either "slightly concerned" or "very concerned" that they may not receive adequate exposure to procedural skills as a result of clerkship changes related to COVID-19. With respect to procedural experience, 80.4% of students were either "somewhat satisfied" or "very satisfied" with their exposure to procedural skills during this clerkship, and 85.4% either "somewhat agreed" or "strongly agreed" that these experiences increased their confidence in performing future bedside procedures. Nearly all students (95.1%) either observed or performed all four of the primary procedural skills of interest.

Conclusion: Medical students consider exposure to procedural skills an important component of their medical education. Despite the curricular changes related to COVID-19, the Surgery Core Clerkship was able to continue fostering confidence in students' procedural skills, thus providing them with a strong foundation for future clinical experiences.

Poster 4: A Journal Club Is Born

Author: Natasha Dole, Senior Registrar, Department of Emergency Medicine, Oxford University Hospitals, UK

Description: Clinicians struggle to keep abreast with rapidly evolving & enlarging volumes of contemporary medical literature. To circumvent this, Sir William Osler established the first journal club in 1875, which has since been a popular form of continuing professional development. By 1900, journal clubs were a routine part of medical education and have evolved immensely since enabling clinicians of varied levels to review current evidence-based research which focus on the relevance & impact on daily clinical practice. 3 June 2020 gave birth to the first monthly Journal Club at the John Radcliffe Hospital. Scheduled on the first Wednesday of every month, clinicians can either attend in person or online via Microsoft Teams. The latter is the preferred option as this facilitates less work disruption whilst adhering to pandemic guidelines.

Objectives:

- Provide, incorporate & promote evidence based, current & relevant literature
- Disseminate effective, innovative clinical practice & cost effectiveness
- Fine tune & develop critical appraisal research skills
- Identify needs for Trust service improvement & redesign of existing protocols
- Facilitate informal dialogues in safe, enjoyable environment
- Promote interdisciplinary collaboration & engagement
- Reduce knowledge to practice gap
- Improve patient care
- Improve presentation & communication skills

Setting and Participants:

- Flexible, varied presentation formats
- No template
- Informal & didactic
- 1 hour sessions
 - X2 Presenters (volunteer)
 - X2 Presentations
 - § x30 minutes each

- Interactive, structured discussion
- Citations circulated beforehand
- Attendance & article log recorded
- CPD certificates awarded

Lessons Learned:

- Virtual interaction & engagement preferred
- Attendance rates affected by preparation, staff constraints & varying schedules
- Need to increase staff confidence & familiarity in presenting scientific data

Proposed Solutions to Increase Attendance Rates:

- Regular feedback surveys
- Record virtual sessions
- Mandatory attendance
- Incorporate curriculum linked articles
- Discuss renowned articles with varied study design
- Generate questions prior to sessions
- Engage multidisciplinary teams

Evaluation: An average of 15 people have attended Journal Club since its inception. This has been a well-received, successful, educational modality among staff. These sessions empower likeminded clinicians keep up with the current literature whilst enabling networking and knowledge dissemination thus improving patient care. Further research to evaluate and optimise this new, evolving concept is underway.

Poster 5: The Future of Neurology Virtual Education: Translation of a Telemedicine Pilot Elective to the Neurology Core Clerkship During COVID-19

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Background: During the COVID-19 pandemic, medical schools suspended in-person electives and rotations. In response, the Neurology Clerkship Team designed and piloted two offerings of a virtual rounding elective titled, *Virtual Patient Rounds in Neurology*. This elective laid the groundwork for the teleneurology week now incorporated within the Neurology Core Clerkship.

Aim: To demonstrate the value of adding teleneurology education to the Neurology Core Clerkship.

Methods: We piloted a two-week faculty-led virtual rounding elective in April and May 2020. A comparison of student's self-reported confidence in clinical skills was conducted based on pre- and post-course surveys. Inspired by this pilot, a teleneurology week was incorporated into the Neurology Core Clerkship (July-October 2020). During the three-week clerkship, students were assigned each week to either an inpatient neurology service or the teleneurology service which consisted of teleneurology clinics and synchronous live sessions. Teleneurology week results were compared to the combined in-person service data. Post-course surveys reported satisfaction on a Likert scale. Student's t-tests and Mann-Whitney U tests were used for statistical analysis.

Results: Fourteen Johns Hopkins medical students participated in the *Virtual Patient Rounds in Neurology*. Following elective completion, students reported an average increase in confidence obtaining a telehistory (2.14 to 3.93; $P < 0.0001$) and an increase in confidence conducting a teleneurology physical exam (1.36 to 3.14; $P < 0.0001$). 57% of participants reported an increased likelihood of choosing a career in neurology.

In the Neurology Core Clerkship, there was no metric demonstrating a statistically significant difference in learning experiences between the teleneurology week ($n=34$) and in-person services ($n=131$). Mann-Whitney test did not show a difference in faculty teaching efficacy between the telemedicine (Mdn=5) and in-person group (Mdn=5), $U=2001$, $p=0.1814$. There was no difference between overall education experience in the telemedicine (Mdn=5) and in-person group (Mdn=4), $U=2022$, $p=0.2061$. The top student concern during the teleneurology week was limited experience conducting independent histories and teleneurology physical exams.

Conclusions: Due to the COVID-19 pandemic, the virtual clinical education format has become a more common component of the curricular paradigm. In our study, formal telemedicine education increased student clinical confidence and did not show inferiority to in-person experiences.

Poster 6: Flipped Ophthalmology Classroom Augmented with Case-based Learning

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Introduction: The flipped classroom is an effective way to teach ophthalmology to medical students. Nonetheless, there are significant drawbacks to the flipped classroom environment, the most significant of which are concerns of burden and pressure on the part of the learner. The purpose of this study was to examine medical students' perceptions of a case-based flipped classroom style compared to a traditional didactic lecture series, and to evaluate the impact of case-based learning on students' confidence managing common ophthalmic complaints.

Hypothesis: By allowing students to take advantage of the flipped classroom lecture content before the in-person case-based lecture series, we hypothesized that students would feel more confident during the case-based discussions thereby mitigating feelings of anxiety and burden.

Methods: We created an interactive case-based flipped classroom ophthalmology curriculum. Paired pre-/post-clerkship surveys were distributed to students on the first and last day of the 2-week clerkship. Questions were formatted as statements using a 6-point Likert scale to assess students' prior exposure to a flipped classroom, perceptions of the flipped classroom curriculum, and confidence in evaluating ophthalmic complaints.

Results: Seventy-five students were included in our analysis from July 2019 to March 2020. Pre-clerkship questionnaires revealed no preference for either teaching modality. Wilcoxon signed rank test comparing pre-/post-clerkship data revealed a significant increase in student ratings favoring the case-based flipped classroom model. Students reported significant reductions in pressure to perform, course burden, and overall anxiety; and increased confidence triaging common eye complaints.

Conclusion: Students favor the case-based flipped classroom modality which prioritizes key learning objectives while increasing participation and confidence. The reproducibility and accessibility of standardized prepared video lectures and cases will help other institutions better incorporate ophthalmology into pre-existing rotations. Because this model utilizes electronic lecture delivery and synchronous discussions, this model provides a sustainable and efficacious curriculum as educators adapt to the COVID-19 pandemic.

Poster 7: Medical Students' Perspectives on COVID-19: Preliminary Findings from a Qualitative Analysis

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Background: The COVID-19 pandemic has had a profound impact on medical students, bringing forth challenges that are academic, socioeconomic, professional, and psychological in nature. Given the recency of the pandemic, literature on such impacts is limited.

Hypotheses/Aim: The purpose of this project is twofold: first, to understand the perspectives of medical students and how the pandemic impacted their professional identities; second, to explore opportunities for medical education reform during and after the pandemic. We hypothesize that medical students experience myriad challenges in the face of COVID-19 and develop unique perspectives on their roles as members of the healthcare team.

Methods: The study design is qualitative. Eligible participants were all medical students at Georgetown University. After obtaining IRB approval, participants were recruited via electronic class announcements and snowball sampling. Interview guides were developed after performing literature review. Twenty interviews were conducted virtually, anonymized, audio-recorded, transcribed, and analyzed to identify themes.

Results: Thematic analysis was organized with social ecology as the sensitizing concept. Each level of the ecological model was used to examine medical student perspectives on the impact of COVID-19 on medical education: individual, interpersonal, community, and society. At the individual level, students felt burdened by the heroism narrative in the media, financial strains of being in medical school, personal issues (e.g. loss of a relative or employment due to COVID-19) and challenges posed by a virtual curriculum. At the interpersonal level, students felt isolated and missed opportunities to develop camaraderie with their colleagues due to social distancing guidelines. At the community level, students felt compelled to utilize their limited clinical skills to help their communities. At the society level, some students expressed a desire for a more coordinated federal government response to the pandemic. All of these components interacted with one another to influence professional identity formation.

Conclusion: This study seeks to contribute to evolving literature on the impact of COVID-19 on medical education. Medical student perspectives offer valuable insight into opportunities for education reform during and after the COVID-19 pandemic.

Poster 8: Evaluation of an Ophthalmology Virtual Elective during the COVID-19 Pandemic

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Background: The COVID-19 pandemic has urged residency programs to create virtual platforms to provide applicants with away rotations, residency interviews, and open houses, to the same level of quality of in-person activities. In order to provide applicants the opportunity to learn more about the Weill Cornell Ophthalmology program and faculty members the ability to evaluate applicants, the two-week Weill Cornell Ophthalmology Virtual Elective was created.

Aim: This study seeks to evaluate the effectiveness of the learning materials (i.e. lectures, assignments) offered in the elective and to understand the subjective experiences of applicants and faculty.

Methods: A two-week virtual ophthalmology curriculum was offered to fourth-year medical students. The curriculum included lectures on common ophthalmology topics in addition to assignments. The students also participated in Grand Rounds and resident morning lectures and gave a presentation to the faculty. At the beginning and end of the elective, we provided a knowledge assessment. At the end of the elective, the students and faculty filled out a survey focused on their subjective experience. Mixed modalities will be used to assess the data.

Results: A total of 17 fourth-year medical students participated in the elective. 11 students underwent both the pre- and post-assessment. The average pre-assessment score was 76% +/- 0.12% and the post-assessment score was 96% +/- 0.07%. 16 students and 4 faculty members completed their respective subjective experiences survey. 50% (8/16) of the students did not have an ophthalmology department at their home institution. 87.5% (14/16) of students had completed an in-person ophthalmology elective prior. 69% (11/16) strongly agreed that the virtual elective provided them the opportunity to learn more about the WCM ophthalmology program. 81% (13/16) of students strongly agreed or agreed that they were able to establish rapport with the WCM faculty. 100% of faculty members strongly agreed or agreed that they were confident in assessing the students in various areas and were able to establish rapport with the students.

Conclusions: Our virtual elective served to be an appropriate substitute during the COVID pandemic and offers the opportunity to establish a virtual component to our future away rotations.

Poster 9: Work in Progress: Learning analytics for medical education, a primer

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Background: Learning Analytics (LA) is an emerging interdisciplinary field that analyzes data about learners and their contexts. Its aim is to understand and improve students' academic performance and learning environments. The Covid19 pandemic has accelerated the incorporation of Technology Enhanced Learning (TEL) in the teaching and learning process of health science students due to the need for remote learning and the reduced access to physical clinical immersion. This scenario poses a clear opportunity to implement data-related processes and learning analytics strategies to improve the development and assessment of TEL in higher education institutions. We believe that there is a range of possibilities that have not yet been explored in depth for institutions to take advantage of the momentum and adapt learning modes to take advantage of hybrid modalities that could enhance learning and assessment of procedural and other skills in health education.

Aim: The purpose of this work is to describe the current state of the art regarding learning analytics in health science education.

Methods: In the first stage, a scoping review was carried out. We defined the research question and the inclusion criteria. In the second stage, we conducted a narrative literature review on a set of articles to first sort out the information and then to categorize it using a chart for dissemination.

Results: This work presents the results of a thorough literature search. The selected studies were analyzed, extracting frequently used concepts, used sources for obtaining student performance indicators, methodological quantitative and qualitative approaches for data analysis, and artificial intelligence strategies used for analysis of learning data.

Conclusion: This work in progress synthesizes the body of knowledge for LA in Health Science education in a span of 10 years, but relying heavily on the last 5. It will discuss some of the needs for learning analytics strategies to teach medical procedures, and potential benefits from the perspective of both teaching staff and students. Considering COVID19, this review will serve as a primer for any institution willing to incorporate LA in their training.