The 5 M’s and More: A New Geriatric Medical Student Virtual Curriculum During the COVID-19 Pandemic

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The COVID-19 pandemic forced many medical schools to remove students from clinical rotations. This situation brought a sudden demand for online curricula to fill the place of in-person clinical teaching. At the same time, the disproportionate impact of the pandemic on older adults triggered a focus on geriatric populations often underrepresented in medical education. We developed a 2-week virtual elective for clerkship students to meet the increased demand for both online learning and geriatrics education.

The geriatric 5 M’s is a succinct way to describe the core competencies of geriatric medicine. This framework consolidates many tenets of geriatrics into five topics (Medications, Mobility, Mind, Multicomplexity, and what Matters most), and it has been used as a teaching tool at all levels of medical education. We used the 5 M’s and the context of the COVID-19 pandemic to structure our curriculum. Given previous work showing that medical students prefer multiple learning styles, we intentionally incorporated a combination of synchronous and asynchronous modalities to meet the needs of learners within the confines of a virtual educational environment. Here we describe the design, implementation, and evaluation of our novel virtual geriatrics elective.

METHODS

We developed a 2-week multimodal virtual geriatrics elective (Table 1 and Supplementary Table S1). Each day of course instruction included a combination of short online didactics (presented live or prerecorded), readings, podcasts, interactive cases, discussion board posts, and virtual group discussions. We used a learning management system (Canvas; instructure.com) to organize the course. Assignments encouraged students to reflect on the relevance of the principles of the 5 M’s in the COVID-19 pandemic to underscore the importance of course content. The curriculum was offered as an optional elective; our institution does not require geriatrics rotations during the preclinical or clinical years.

Teaching Modalities

Multimedia with Discussion Posts

We selected articles, podcasts, and other online resources that corresponded to each of the 5 M’s (Supplementary Table S2). Students were asked to review material independently and respond to discussion prompts on Canvas for both preceptor and peer review.

Case-Based Learning

Aquifer Geriatrics is a set of 26 virtual patient cases designed to help students learn principles of geriatric medicine. We selected six cases that fit with the themes of the course for independent completion.

Small Group Assignments

Students worked in groups of three to eight for select course assignments and discussions (Supplementary Table S3). All group meetings were virtual. Some occurred as breakout groups within a scheduled large group meeting, and others were coordinated by students.

Large Group Meetings

The course faculty hosted two to three large group meetings per week on a virtual meeting platform. This included short slide presentations and discussion of small group work.

Older Adult Interview

Students identified and interviewed a relative, community member, or primary care patient by telephone during the
| Curriculum | Student feedback |
|------------|-----------------|
| **Day 1 Intro** | -Reading: Health care for older adults, ageism, and COVID-19 (A)  
- Virtual Lecture: Geriatrics Assessment (S)  
- Case: Aquifer Geriatrics 13 (function and prognosis) (A)  
- Discussion Board: Care for older adults during a disaster (A) | -“Very helpful and applicable to many fields of patient care.”  
- “The geriatrician’s perspective is an invaluable one.” |
| **Day 2 Mobility** | -Reading: Gait exam, assistive devices (A)  
- Podcast: Falls in the Emergency Department (A)  
- Case: Fall risk assessment (A)  
- Discussion Board: Mobility challenges in Philadelphia, impaired mobility during COVID-19 (A) | -“I really liked the selection of readings/Aquifer cases/podcasts.”  
- “It was nice to hear about stuff that is applicable to my grandparents as well as patients.” |
| **Day 3 Mind** | - Recorded Lecture: Dementia overview (A)  
- Podcast: Dementia diagnosis and management (A)  
- Case: Aquifer Geriatrics 4 (dementia) (A)  
- Virtual Discussion (large group with small group breakouts): Dementia case, dementia care challenges in COVID-19 (S) | -“I liked the lectures that were prerecorded by faculty or done on BlueJeans as it was a good chance to see what the main points I should focus on were.” |
| **Day 4 Mind** | -Reading: Depression in older adults (A)  
- Recorded Lectures: Depression treatment, delirium review (A)  
- Case: Aquifer Geriatrics 7 (depression, cognitive screening) (A)  
- Discussion Board: Depression and delirium cases, visitor restrictions during COVID-19 (A) | -“I love how it taught the fundamentals of geriatrics while drawing good examples in the current pandemic!”  
- “The material on dementia vs delirium vs depression was extremely helpful.” |
| **Day 5 Multicomplexity** | -Reading: Managing patients with multiple illnesses (A)  
- Podcast: Multimorbidity (A)  
- Case: Complex patient case (small groups) (S)  
- Discussion Board: Multimorbidity case reflection, triage of complex older adults with COVID-19 (A) | -“I found case discussions very helpful and would like to have done more.”  
- “It would be nice to ask students to turn cameras on, especially for small group time.” |
| **Day 6 Multicomplexity** | - Podcast: IDT in the hospital (A)  
- Case: Aquifer Geriatrics 23 (hazards of hospitalization) (A)  
- Discussion Board: Questions about IDT colleagues (A)  
- Virtual Discussion (small group preparation with large group student presentations): Sites of care (S) | -“I think more small group discussion would be nice over large group discussions. I think this comes with the use of online meeting technologies that makes talking in a large group particularly confusing.” |
| **Day 7 Medications** | -Reading: Polyparmacy article, AGS Beers Criteria® list, STOPP/START criteria (A)  
- Case: Aquifer Geriatrics 1 and 2 (medication risks/benefits) (A)  
- Virtual Discussion (large group with small group breakouts): Deprescribing case (S) | -“I really liked the polyparmacy activity—was fun trying to interpret and reconcile the ‘patient’s’ list of medications and make new recommendations in small groups.” |
| **Day 8 Matters Most** | -Reading: Patient value-based care, communication tools (A)  
- Podcast: Prognostication (A)  
- Case: Cancer screening in older adults (A)  
- Discussion Board: Difficult conversations (respond to peers), advanced care planning during COVID-19 (A) | -“I really enjoyed the assignments that involved responding to other students’ discussion posts; this kept me engaged.” |
| **Day 9 Matters Most** | -Reading: Healthy aging (A)  
- Discussion Board: Create and share a community resource infographic, reflection on “aging well” (A)  
- Patient Telephone Interview: Older adult patient or relative (A)  
- Virtual Discussion (small groups): Interview reflections | -“I loved the discussion about our elder adult phone calls.”  
- “I liked the focus on community resources. It’s definitely awesome to be given prompted time to see what’s out there.” |
| **Day 10 Wrap-up** | - Final Writing Assignment: Social determinants of health in older adults, challenges in disaster management (A)  
- Virtual Discussion (large group): Recap (S) | -“Will recognize the importance of representation of geriatricians on policy committees/boards.”  
- “Considering the number of geriatric patients we see throughout our rotations, I’m honestly surprised it’s only an elective.” |

Abbreviations: A, asynchronous learning; IDT, interdisciplinary team; S, synchronous learning; STOPP, Screening Tool of Older Persons’ Prescriptions; START, Screening Tool to Alert to Right Treatment.
second week of the course using selected question prompts (Supplementary Table S4).

Course Instructor Time
Two geriatrics faculty and two geriatrics fellows created and led the course. While the course was running, feedback for assignments was divided among course leaders. Course leaders also divided 4 hours of synchronous instruction during week 1 of the course and 8 hours during week 2.

Evaluation
We used a designated Canvas discussion board for real-time feedback throughout the course including any technical difficulties. At the end of the elective, we distributed an optional and anonymous survey via Qualtrics asking students to rate course components and their experience on a 5-point Likert scale. The University of Pennsylvania institutional review board (IRB) determined that the project qualified as quality improvement work and thus was exempt from full IRB review.

RESULTS
A total of 34 students completed our virtual elective, of whom 23 completed the course survey on Qualtrics (67.6%). All students had completed at least one clinical clerkship and were in their second (n = 25), third (n = 8), or fourth (n = 1) year of medical school. Overall, 95.6% of respondents agreed (somewhat agreed or strongly agreed) that the course was well organized and objectives were clear (n = 22). We asked respondents to evaluate the different course modalities. A total of 74% agreed that the discussion posts enhanced learning (n = 17), 83% agreed that the Aquifer cases enhanced learning (n = 19), 74% agreed that the group activities enhanced learning (n = 17), and 87% agreed that the large group virtual meetings enhanced learning (n = 20).

After taking the course, almost all respondents felt more prepared to take care of older adults (96% [n = 22]). In addition, almost all felt more aware of the impact of the pandemic on older adults (91% [n = 21]).

Open-ended course feedback highlighted new appreciation for geriatric principles, especially the 5 M’s framework and polypharmacy/deprescribing. Feedback also included a range of opinions regarding different teaching modalities. One recurring theme was a preference for small group discussion (Table 1).

DISCUSSION
Our virtual geriatrics elective made students feel more prepared to care for older adults by increasing students’ appreciation of geriatric principles represented by the 5 M’s framework. The context of COVID-19 increased student engagement with course content. Moreover, the multimodal format allowed for both synchronous and asynchronous learning. Consistent with prior research, comments from learners highlighted individual preferences for different learning modalities. Notably, many favored interactive small group sessions using virtual meeting software.

From a faculty perspective, asynchronous assignments such as discussion board posts allowed course instructors to participate around clinical obligations. One limitation to this format is the time-intensive nature of providing written feedback to multiple student assignments. When this was noted, we did alternate between individual and class-wide comments. Both were well received. Based on real-time feedback, we were able to convert one written assignment to an additional small group session, and we plan to include more group-based virtual learning in future iterations of the curriculum.

Geriatrics has long been underrepresented in medical education. This course demonstrates that broadening medical student exposure to geriatrics through multimodal online learning is both feasible and well received. Moving forward, we must continue to foster student awareness of geriatric principles after the COVID-19 pandemic has passed from the national spotlight.

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SUPPORTING INFORMATION
Additional Supporting Information may be found in the online version of this article.

Supplementary Appendix S1: Supporting Information