Piloting a Structured Student Observership to Prepare Medical Physics Graduate Students for Clinical Practice

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Introduction

- The number of applicants entering the MedPhys Match is increasing with each cycle
  - Increased from 348 to 430 registered applicants from 2025 to 2026 [1]
- Applicants will need ways to boost their application packages and remain competitive
  - Clinical experience can boost applications
- Discussions with SDAMPP have indicated residency program directors value hands-on experience and clinical observation as methods of preparation for residency
- CAMPEP does not currently require a clinical practicum in graduate programs, and the level of clinical experience offered varies greatly
- COVID and shifting to log-file based PSQA has limited student involvement in the clinic at University of Wisconsin

Motivation

- Develop a structured radiation oncology observership program with the goals of:
  - Enhancing clinical knowledge
  - Building confidence in clinical topics
  - Supporting career planning
  - Preparing medical physics graduate students for therapeutic medical physics residency

Program Design and Evaluation

- Two groups of four students were enrolled for our first two pilot groups
- Shadowed physics faculty, staff, and residents over a three-month period for approximately 80 hours total
  - Emphasize contextual learning, open discussion, and mentorship
- Students were paired with a member of the ”Student Observership Working Group” to provide longitudinal mentorship over the shadowing period
- Students had the opportunity to shadow the following topics:
  - General physics tasks
  - Physicist of the day coverage
  - Physics plan reviews
  - Brachytherapy and associated QA
  - Stereotactic radiosurgery
  - MR guided radiation therapy
  - Treatment planning
  - Protons
  - Radiopharmaceutical therapy
  - Patient specific QA
  - Monthly linear accelerator QA
  - Monthly CT simulator QA
  - Medical imaging in radiation therapy
- Surveys were administered to the students to evaluate perceived knowledge and confidence improvements, general program feedback, and feedback on faculty and staff
  - Knowledge and confidence improvements were evaluated with a 5-point Likert scale, with 1 indicating no improvement and 5 indicating significant improvement
- Surveys were also administered to the faculty to assess impacts on clinical efficiency, thoughts on timing/scheduling, and overall time commitment

Faculty Feedback

- Results are from the first pilot group
- The faculty survey had a 75% response rate
- 89% of respondents indicated some impact to clinical efficiency **[Figure 1]**
- Each member hosted students around 4, four-hour sessions over the three months
  - 78% indicated number of days hosting students was appropriate **[Figure 2]**
  - 67% indicated that the four-hour session was an appropriate length for each session **[Figure 3]**
- Overall faculty appreciated that students were inquisitive, engaged, and enthusiastic
- Some indicated they ran out of material to cover on slower days

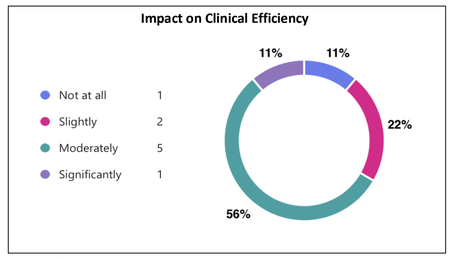

Figure 1. Faculty reported impacts of hosting students on clinical efficiency.

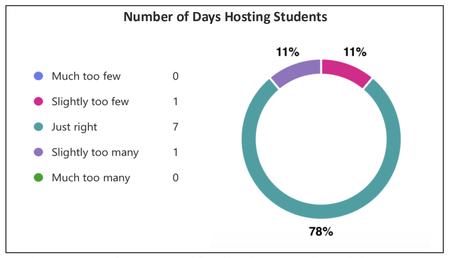

Figure 2. Faculty reported feedback on number of days spent hosting students.

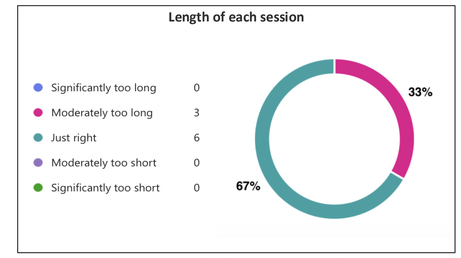

Figure 3. Faculty reported feedback on length of each shadowing session.

Student Feedback

- Results shown are compiled from the two pilot groups
- Student observers included 3 MS candidates and 5 PhD candidates
- The student survey had an 87.5% response rate
- Knowledge improvement scores across all categories averaged 4.0 (range: 2.7 - 4.9), with 1 indicating no improvement and 5 indicating significant improvement **[Figure 4]**
- Confidence improvement scores across all categories averaged 3.6 (range: 2.5 - 4.3), with 1 indicating no improvement and 5 indicating significant improvement **[Figure 5]**
- Students also indicated improvements in understanding of radiation therapy workflows, familiarity with common clinical systems, and understanding on how clinical teams collaborate
  - Also helped them connect coursework to clinical applications
- Students interest in pursuing a clinical career in therapeutic medical physics was strengthened
- Feedback on program structure was positive, with the opportunity to improve on hands-on experience and communication on the objectives of the program **[Figure 6]**
- Overall students found the overall length of time shadowing was appropriate, with varying opinions on length of time shadowing different topics **[Figure 7]**
  - Highlights the need to provide more hands-on opportunities and shadowing experience in some special topics
- Students valued diversity in topics shadowed, time spent asking questions, and observing collaboration
- Recommendations from students to improve the program included having a coursework requirement, finding ways to pivot on slower days, adding more proton and RPT content, and not having as many plan check days

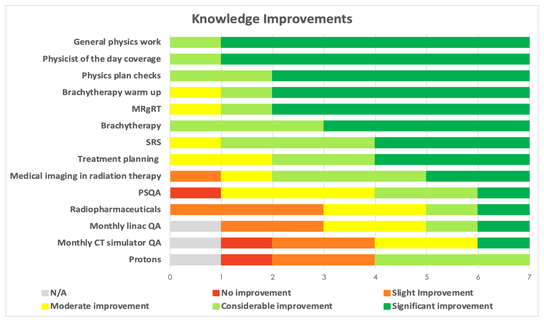

Figure 4. Perceived knowledge improvements across all categories observed. An answer of N/A indicates students were not scheduled to observe this topics.

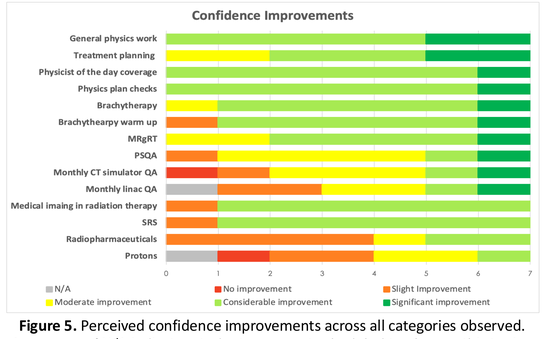

Figure 5. Perceived confidence improvements across all categories observed. An answer of N/A indicates students were not scheduled to observe this topics.

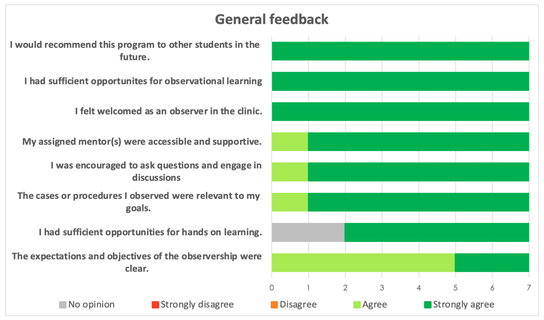

Figure 6. Summary of student feedback on structure of program.

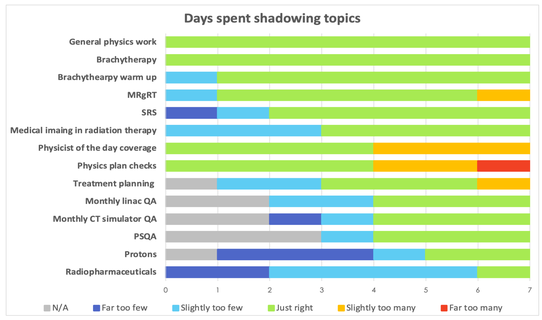

Figure 7. Student feedback on timing of observations of different topics observed in the clinic.

Summary and Future Steps

- We have successfully developed and implemented a student observership in our radiation oncology clinic
- Overall, the feedback from students and faculty was positive, with constructive feedback for areas of improvement
- Our goal is to use this feedback for formalize the program for long term implementation in our department
  - Would like to develop this into a formal course
  - Formalize coursework requirements for participation
- Gather pre- and post- observation surveys to better evaluate growth
- Gather information on MedPhys Match statistics
  - Two MS students from the first pilot group have successfully entered the Match
  - Both students matched with their second ranked program
  - Recommendation to increase hands-on learning opportunities

Acknowledgement

We would like to thank all the physics faculty, staff, and residents who have contributed their time to hosting students for clinical observation. This program would not be possible without the generosity of our colleagues. A thanks to the students as well who participated in this pilot and are helping us grow through their feedback and continued interest.

References

1. https://natmatch.com/medphys/statistics.html