Assessment in the Medical Physics Graduate Program – Jay Burmeister, PhD

Wayne State University's Peer-to-Peer Program Assessment Forum Presentation

In the Winter 2016 semester, 31 faculty and staff were invited to share program assessment examples with their peers in open forums to demonstrate the use of data to improve student learning, program curricula, or support for student success and recognize the important work of our Wayne State colleagues. This document is a brief version of one of those examples.

Jay Burmeister, PhD – Professor, Department of Oncology, WSU School of Medicine

My assessment example comes from the 2014-15 assessment plan for the Medical Physics graduate program. Our graduate program trains graduate students with backgrounds in physics or engineering for careers in the application of physics in medicine. Our graduates participate in research and development, education, and clinical service in the areas of Radiation Oncology, Diagnostic Imaging, Nuclear Medicine, and Health Physics. In this example, we chose to evaluate the quality of our preparation of graduates for clinical service in Radiation Oncology.

Learning Outcome:

One of the program learning outcomes my colleagues and I are interested in assessing is our students' understanding of the practice of clinical medical physics within Radiation Oncology and how well we are preparing our students to apply fundamental physics principles to these clinical practices.

Assessment Method:

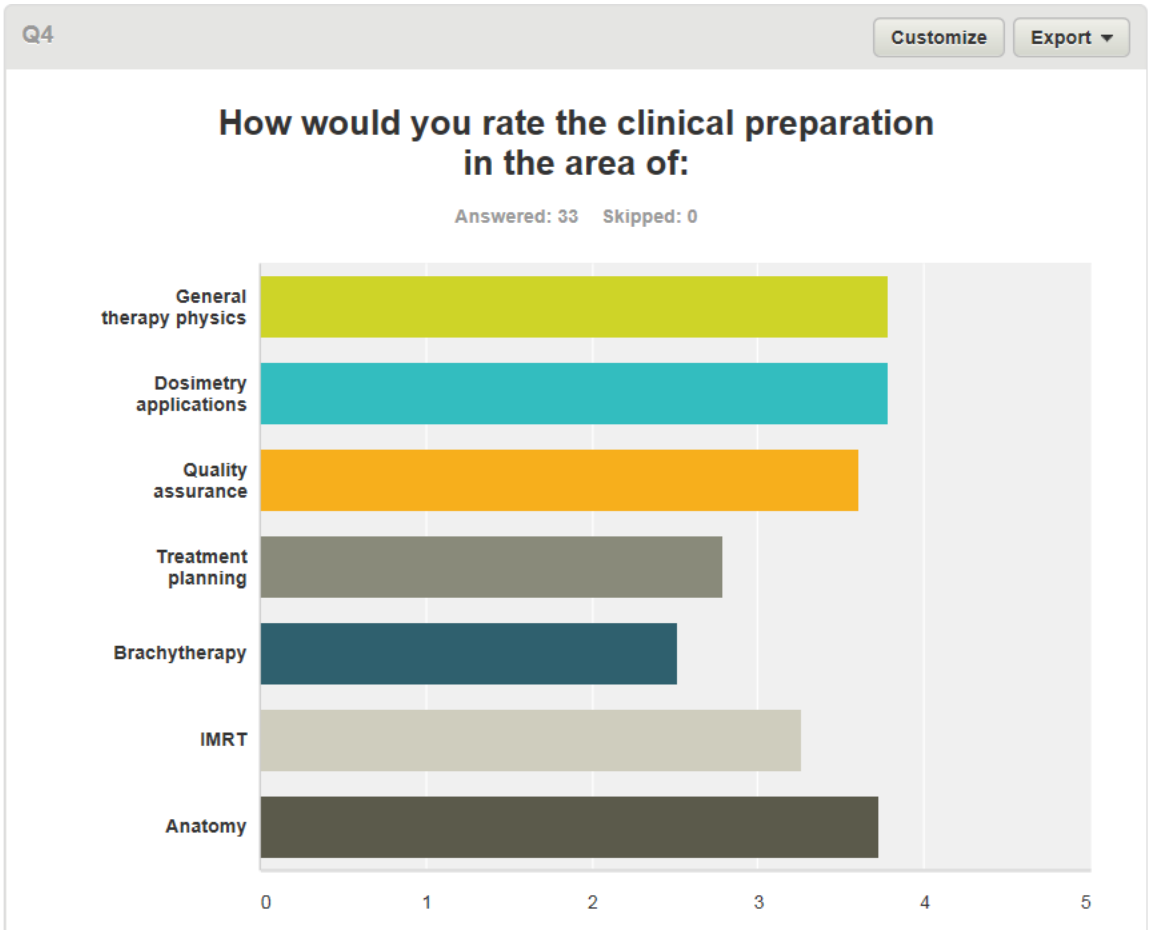
We collected evidence about that learning outcome by creating a survey to evaluate the level of understanding and preparation which was used to collect data from graduates over the previous ten years. Following our educational training, most of our graduates enter clinical medical physics residency positions or go directly into clinical jobs. Within three years, almost all of them will be board certified by the American Board of Radiology for clinical practice in one of the subspecialties of medical physics. The vast majority of our graduates will enter practice in radiation oncology physics. Upon graduation, most students don't have a good appreciation for how well they are prepared for clinical practice. Over the coming years, as they complete residency training, on-the-job training, and become board certified, they understand where they were well prepared as well as where they had weaknesses. For this reason, graduates who are now in clinical practice represent our best measuring stick for the quality of the educational preparation we provide.

The survey was built using the Survey Monkey software and sent to 80 graduates from the prior 10 years, which included all graduates for whom we had contact information. We received 33 responses. Alumni were asked to rate their preparation in our graduate program in 7 different

areas on a 1-5 scale with the following scale ratings: 1=Poor, 2=Fair, 3=Good, 4=Very Good, 5=Exceptional. Our goal is to have alumni rate their preparation in the "Very Good" range for each area (>3.5/5).

Results:

The results from this assessment are shown below in figure form:



And in numerical form:

–	Poor –	Fair –	Good –	Very Good –	Exceptional –	Total –	Average Rating –
General therapy physics	3.03% 1	6.06% 2	24.24% 8	42.42% 14	24.24% 8	33	3.79
Dosimetry applications	6.06% 2	6.06% 2	15.15% 5	48.48% 16	24.24% 8	33	3.79
Quality assurance	3.03% 1	6.06% 2	24.24% 8	60.61% 20	6.06% 2	33	3.61
Treatment planning	12.12% 4	24.24% 8	39.39% 13	21.21% 7	3.03% 1	33	2.79

–	Poor –	Fair –	Good –	Very Good –	Exceptional –	Total –	Average Rating –
–	12.12%	39.39%	33.33%	15.15%	0.00%		
Brachytherapy	4	13	11	5	0	33	2.52
–	9.09%	9.09%	39.39%	30.30%	12.12%		
IMRT	3	3	13	10	4	33	3.27
–	0.00%	15.15%	18.18%	45.45%	21.21%		
Anatomy	0	5	6	15	7	33	3.73

Our areas of weakness were clearly identified as Radiation Therapy Treatment Planning, Brachytherapy, and Intensity Modulated Radiation Therapy. These results were not entirely unexpected. Treatment planning and brachytherapy are specialized technical skills that are usually provided within residency or on-the-job training. However, providing these skills within the graduate education program will give our graduates an advantage in obtaining these residency and clinical positions. IMRT is not only a specialized technical skill, but was still in its infancy when many of these graduates came through the program.

Action Plan:

Based on these results, we set out to improve the three areas with average ratings less than 3.5. The Treatment Planning and Brachytherapy courses have already been overhauled and the IMRT section of the Radiation Therapy Physics course has been expanded. In addition, we have created a 6 month clinical internship within which students participate directly in patient procedures, treatment planning, technical physics duties, and quality assurance processes. We hope that this will provide a substantial improvement in the competency level of our graduates within these areas upon graduation and make them even more competitive for post-graduate opportunities. We plan to survey our graduates again in a few years when we have enough graduates who have come through the improved program structure.