MEDICAL PHYSICS AS AN ANCHOR FOR PHYSICS LEARNING

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Medical physics is a diverse and dynamic field in which principles in physics are used in a healthcare setting. Scientists in medical physics often hold graduate degrees after focused studying and research on specific subtopics within medical physics, but topics in medical physics may be explored in more general introductory physics courses at the university and secondary school levels. Individual lesson plans, units, or even full survey courses covering medical physics topics may be taught to introduce students to topics including medical imaging, nuclear medicine, radiation therapy, health physics, and biophysics.

Previous work has shown that curricula that students perceive as applicable to the “real world” and/or connected to content from other coursework is considered by students as engaging and interesting (Geller, Turpen, & Crouch, 2018). Medical physicists describe finding their field rewarding, often reporting high levels of career satisfaction (Chen et al., 2015). However, students interested in physics early in their studies may not be aware of the existence of this field, or of the possibility to pursue medical physics as a career (Buckley, 2016). Integrating topics in medical physics into the curricula may then serve two purposes: first, it may stimulate learning as a relevant and connected topic to students’ prior knowledge and interests; and second, it may inspire students to consider pursuing physics as a serious topic of study in preparation for a possible career opportunity.

Examples of medical physics topics that may be used in the physics classroom could include examining the concept of radioactive decay to explore basic statistical processes and distributions; reviewing magnetic resonance imaging (MRI) physics to discuss introductory topics in quantum mechanics and electricity and magnetism; using radiation protection and radiation shielding design to discuss practical applications of the inverse square law; and reviewing medical ultrasound to explore oscillations and waves. Physics educators are encouraged to consider integrating some examples from medical physics into their curricula to spur student engagement and to acquaint students to one example of a rewarding career opportunity in physics.

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