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"Accelerating the Learning Curve in Pediatric Musculoskeletal Radiograph Interpretation for Orthopedic Surgery Post-Graduate Trainees"

Orthopedic surgeons practice as experts in the diagnosis of fractures in children and adults. However, x-rays of children's bones can be difficult to interpret since the skeleton changes so much between birth and adulthood. Right now, orthopedic surgery trainees primarily learn to interpret these x-rays as a result of case-by-case experience. This means that orthopedic trainees experience common examples of bone x-ray findings but may see only a few or no examples of less common injuries, which may result in knowledge gaps. Interpretation error can lead to the wrong diagnosis of a child's injury and late presentations for definitive care. Some of these children will face significantly more invasive and complicated surgical interventions and ultimately worse outcomes. Our group has developed an evidence-based customized web-based learning platform that teaches doctors how to interpret image-based cases. The main goal of this project is to adapt 1,800 x-ray-based cases of children's bones to this learning platform and permit orthopedic surgery trainees at several sites in Canada and the United States to practice the x-ray diagnosis and risk-category to a mastery level of performance. After every case they do, they will get feedback on their responses, so they will learn from every case encounter. We will ensure that the trainees are exposed to a breadth of case examples necessary for safe practice once they graduate. From our data, we will determine the orthopedic surgery trainee learning journey and identify the participant factors that result in a steeper (i.e. more efficient) slope in learning. We will also identify the most difficult to diagnose cases that are the biggest threats to patient safety. Upon conclusion of this work, the learning platform will be accessible to any orthopedic surgery trainee globally, and therefore orthopedic surgeons worldwide can potentially improve their bedside diagnosis of these injuries.