Dr. W. Brent Edwards and Dr. Prism Schneider

"Effects of high-dose bisphosphonate treatment on fatigue properties and fracture patterns in ovariohysterectomized rabbits"

Osteoporosis is a disease characterized by low bone mineral content and quality that affects approximately 2-million Canadians. The clinical consequence of osteoporosis is an increased risk of bone fracture, which accounts for more hospital time than heart attack, stroke, and breast cancer combined. Bisphosphonates are a class of osteoporosis drugs known to reduce fracture risk up to 50%; however, the use of bisphosphates has declined and for the first time in 20 years osteoporosis fractures are on the rise. The decline in bisphosphonate use has been attributed to fear of rare side effects, including atypical femoral (thighbone) fracture, which is a brittle-like fracture of the femoral shaft. The exact cause of atypical femoral fracture has yet to be identified, and this study will quantify the effects of high-dose bisphosphonate therapy on changes to bone quality and fracture patterns in an animal model of osteoporosis. Our approach will take advantage of state-of-the-art mechanical testing and advanced imaging techniques that will allow us to answer questions about the mechanisms of atypical femoral fracture that have long concerned the osteoporosis scientific and medical communities. Our research team includes clinicians on the front line of osteoporosis management to ensure our research extends beyond the scientific community and into the advancement of clinical knowledge and healthcare strategies to improved bone quality and fracture risk across Canada. The burden of osteoporosis can only be addressed through the safe and effective use of osteoporosis drugs, and identifying the causal link between bisphosphonate therapy and atypical femoral fracture represents a critical first step towards achieving this goal.