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Project Title

Development of Clinical Tools to Guide Diagnosis and Treatment of Osteoporosis in Older Adults

Project Summary

Hip fractures are one of the leading causes of mortality in older adults. A major contributor to hip fractures and fragility is osteoporosis, a disease commonly associated with age that reduces bone mass and strength. The current method of diagnosis relies on a bone mineral density score which is shown to be poorly correlated with actual fracture risk. Our technology uses machine learning and image processing techniques to improve the prediction of fracture risk by considering geometry and distribution of bone material, while still using standard clinical scans. We will use the Canadian Longitudinal Study on Aging database to ensure the technology works for a wide range of patients, and to look into the effects of factors such as sex, age, ethnicity, exercise, smoking, medication, and previous fractures on osteoporosis progression. Clinicians will then use this information to develop individualized treatment plans to prevent fractures from occurring.

Keywords

DXA scan, Hip fracture risk, Image processing, Statistical shape and appearance modelling, Bone mineral density, Osteoporosis