Offer of topics for Ph.D. study projects in Third Faculty of Medicine, Charles University in Prague

Project:	**Development and validation of an assessment tool for predicting fragility fractures in the thoracolumbar spine.**
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Project Narrative: *(max. 500 characters including spaces):*	Osteoporosis and its consequent increase in fracture risk is a major health concern in both men and women, especially with an ever growing population of the elderly. Studies indicate that a Caucasian woman over 50 years has a 16% life-time risk of a hip fracture and a 32% chance of a vertebral fracture. This has major socio-economic implications for healthcare planning. Several multi-factorial diseases [e.g., diabetes, stroke] are defined on the basis of important risk factors to assess clinical outcomes. Many well-controlled prospective studies with dual energy X-ray absorptiometry (DXA), particularly in the elderly indicate that the risk of fracture about doubles for each SD reduction in bone mineral density (BMD). But the risk of osteoporotic fragility fractures, like other diseases (heart disease etc.) are multifactorial. The imperfect capture of risk with BMD alone poses several problems for the clinical assessment of fracture risk with the performance characteristics of the test being less than optimal due to lack of sensitivity. The use of other risk factors that add information on fracture risk independent of BMD improves sensitivity. The FRAX (fracture risk assessment tool) was based on the use of clinical risk factors with or without bone mineral density tests to assess the hip fracture probability in men and women and has provided a validated framework which enhances the assessment of hip fractures. A similar assessment tool for predicting fracture risk in postmenopausal women has been developed. The FRACTURE Index comprising a set of seven variables to include age, BMD T-score, fracture after age 50 years, maternal hip fracture, body weight and gait pattern was shown to be predictive of hip fractures as well as vertebral and non-vertebral fractures. Vertebral compression fractures are the most common osteoporotic fractures. However they are often found incidentally on imaging done for other reasons, since they are often asymptomatic, but also associated with high rates of morbidity. While there are effective treatments to reduce fracture risk and also it's acute management, only a fraction of patients receive osteoporosis care and follow-up or an

	intervention for acute fractures. There is no clinical tool dedicated to the assessment of vertebral osteoporotic fractures. The aim of the present study is to develop a model for the clinical assessment of fracture probability in the thoracic and lumbar spine in men and women aged more than 60 years and to further validate it.
Requirements for student applicants: *(specify your requirements such as degrees or period after degree was granted)*	**Orthopedic or trauma surgeon with minimal 2-3 years of clinical experience**