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Disuse osteopenia: The short- and long-term effects of
post-traumatic and post-surgical immobilisation following
lower limb injury or total knee replacement.

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Disuse osteopenia: The short- and long-term effects of post-traumatic and post-surgical immobilisation following lower limb injury or total knee replacement.

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by

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ABSTRACT

Low trauma hip fractures, due to bone fragility, are a major healthcare burden with serious consequences for individuals in terms of long-term morbidity and mortality; and also for society due to the high medical and care costs associated with these injuries. Because of the association with low bone mass, these fractures are particularly prevalent in elderly populations and are likely to become more common as longevity increases globally. Avoidance of these fractures is therefore an extremely important goal.

Low bone mass, manifested in the conditions of osteopenia and osteoporosis, is the primary cause of bone fragility, and reductions in bone mass are the inevitable corollary of aging and menopause. Bone loss may be exacerbated by immobilisation and reduced weight-bearing activity, giving rise to the condition of disuse osteopenia. Immobilisation may itself be the result of low trauma leg fragility fractures that potentially causes further bone density loss. If this loss occurs at the hip, there is an increased risk for hip fracture as a sequela to the original injury. Osteoarthritis is also a condition strongly associated with aging that may necessitate knee arthroplasty as a last stage treatment, potentially causing a period of reduced mobility and weight-bearing activity following surgery. Leg fracture and knee replacement both present additional risk factors for hip fracture due to changes in muscle mass, gait and postural stability that may increase the risk of falls.

This study aims primarily to investigate the effects of immobilisation on leg fracture and knee replacement patients, immediately following injury or surgery, in order to quantify bone and muscle loss and to monitor recovery over a one year period. A

postmenopausal population were studied as they are already losing bone density systemically and may be at greater risk of further bone loss following immobilisation. Factors of activity, function, weight-bearing, pain, treatments, therapies, health perceptions and mental wellbeing, that potentially contribute to bone loss and recovery, were also investigated. Results from the study may provide information relating to increased future hip fracture risk and lead to treatment options to alleviate bone loss in these groups.

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