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"Determining the role of physical activity in the development of hip impingement morphology in adolescents during the final stages of skeletal maturation"

Femoroacetabular Impingement (FAI) is the leading source hip pain in healthy active young people, and the hypothesized underlying etiology in primary hip osteoarthritis (OA) which is the most common reason for undergoing total hip replacement surgery. Recent evidence has made it clear that the development of the morphology of the proximal femur that leads to this clinical pathology occurs during adolescence, and appears to have an association with physical activity. Our hypothesis is that the development of the morphological skeletal changes does in fact take place during this timeframe, and that physical activities that load the hip, and in particular the proximal femoral growth plate, play a causative role. We propose to better define the role activity plays, the relevant risk factors, and to construct a developmental model for the morphological changes, by prospectively studying two groups of early-adolescent volunteers: those involved in organized competitive athletics and those involved only in recreational physical activities. By using magnetic resonance imaging (MRI) at three key time points during maturation, and examining in depth the levels and types of physical activity, we will be able to determine more definitively the role that activity plays. Ultimately, the prevention or diminution of the development of FAI morphology could have significant effects on the incidence of clinical FAI and primary OA of the hip.