

# **TENNIS SERVE BIOMECHANICS IN RELATION TO BALL VELOCITY AND SHOULDER JOINT INJURIES**

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Tennis players are confronted with a crucial problem: how being more efficient by increasing serve's ball velocity and limiting risks of shoulder overuse injuries? The aim of this presentation is to analyze, identify and understand the biomechanical determinants of the tennis serve responsible for the performance's enhancement and the arrival of overuse upper limb joint injuries. Any kinematic or temporal pattern that significantly increases joint kinetic values without increasing ball velocity is thus considered as "pathomechanical". Indeed, even minor technical and temporal errors during the tennis serve, which are continually repeated throughout a match, a competitive season, or a career, may affect the performance, increase kinetics, and consequently cause tendon overuse instability problems in dominant shoulder. Conversely, proper temporal mechanics may enable players to achieve maximum performance with minimum chances of injury. Among these pathomechanical factors, an improper energy transfer during the tennis serve can decrease ball velocity, increase upper limb joint kinetics, and thus increase upper limb overuse injuries.