How to Maintain Optimal Ergonomics During Fixation of Tibial Fractures

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Introduction: Orthopedic surgeons are at a high risk of work-related musculoskeletal injuries due to the repetitive and physically demanding nature of their tasks [1,2,3,4,5,6]. A 2023 systematic review estimates that nearly 40% of orthopedic surgeons reported experiencing a work-related musculoskeletal disorder, and more than 25% of them sought treatment for it [1]. Proper ergonomics in the operating room are essential to mitigate these risks and ensure both surgeon well-being and surgical precision. This study focuses on the significance of ergonomics during tibial fracture fixation using intramedullary nailing, specifically examining the infrapatellar and suprapatellar approaches.

Methodology: This video provides analysis of both optimal and sub-optimal ergonomic practices during tibial fixation surgeries. The video captures detailed steps of the procedure, highlighting the ergonomic principles applied in each case. Risk associated with specific positions was quantified using the Rapid Upper Limb Assessment. Key ergonomic variables analyzed include operating table height, surgical assistant placement, operating room space management, elbow positioning, X-ray monitor placement, and the use of operating room approved stools for height adjustment.

Conclusions: Video analysis revealed that poor ergonomic practices, such as operating at improper table heights, working above elbow level, and suboptimal monitor positioning, significantly compromise surgical precision and increase the risk of musculoskeletal injuries. Conversely, adhering to ergonomic best practices, such as maintaining elbows at 90 degrees of flexion, positioning monitors within the surgeon's direct line of sight, and using stools to achieve the correct operating height, enhances surgical performance and reduces physical strain. Emphasizing proper ergonomics during tibial fixation surgeries can lead to better surgical outcomes, prolonged surgeon careers, and improved patient care. These findings are broadly applicable to various orthopedic procedures, underscoring the critical importance of ergonomics in surgical practice.

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