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# Postural analysis of paramedics simulating frequently performed strenuous work tasks

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**Abstract**

Paramedics who perform emergency rescue functions are highly susceptible to musculoskeletal injuries. Through an interview and survey process firefighters, many of whom are cross-trained paramedics in a consortium of 14 suburban fire departments, identified and rated tasks that were perceived to be both strenuous *and* frequently performed. The objective of the current study was to describe the working postures and the forces applied as firefighter/paramedics (FF/Ps) simulated specific roles within the following tasks identified by the survey: (1) transferring a patient from a bed to a stretcher using bedsheets, (2) transferring a patient from the ambulance stretcher to a hospital gurney, (3) carrying a victim down a set of stairs and around a landing using a stairchair, (4) carrying a victim down a set of stairs and around a landing using a backboard, and (5) carrying a victim down a set of stairs using a stretcher. Ten two-person teams of FF/Ps participated and were videotaped to obtain postural data for the upper and lower extremities as they performed each role in the simulated two-person tasks. Trunk postures were obtained using *lumbar motion monitors*. Static hand forces were estimated using a hand-held dynamometer at the most physically demanding points for each role within each task. The postural and force data were averaged across subjects performing identical roles to quantify the postures assumed by the FF/Ps at the most strenuous moments during task performance. Based on these analyses we concluded that: (1) when transferring victims from a bed to a stretcher the FF/P on the bed was able to maintain an upright and more stable posture by standing as opposed to kneeling, (2) an interface board should be used to reduce the frictional forces when transferring victims from a bed to a stretcher or from a stretcher to a gurney, thereby reducing the need to lift the victim with flexed torsos and /or shoulders, and (3) equipment and training that encourages the FF/P in the leader role to walk facing forward during victim transport, especially when descending stairs, potentially results in safer transit. 

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