The Promise of Computer-Aided Ergonomics in Intensive Care

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Introduction

Computer-Aided Ergonomics is a novel method, which is quickly establishing itself in the advanced industry [1,2]. This paper describes the promise of this technology for assessment of working situations typical for intensive care.

Methods

In the present case we use the AnyBody Modeling System, which is based on inverse dynamics and recruits muscles by a minimum fatigue criterion [3]. This enables the system to handle very complex models on ordinary personal computers. The system computes individual muscle forces and joint reactions, and therefore allows for comparison of loads on the body in different postures and working situations.

Fig. 1. A forward-leaning working posture.

Results and Conclusions

Fig. 1 illustrates a typical forward-leaning working posture. As indicated by the muscle thicknesses, the model is recruiting primarily the hamstrings and spine muscles to balance the effect of gravity. A continuous variation of the angle between thighs and thorax from 0 to 90 degrees reveals the effect of the posture on body loads such as muscular activity and pressure on the spinal disk between L5 and sacrum as illustrated in Fig. 2. Such investigations allow for detailed assessment of the influence of the design of the intensive care environment on the performance and safety of the personnel.
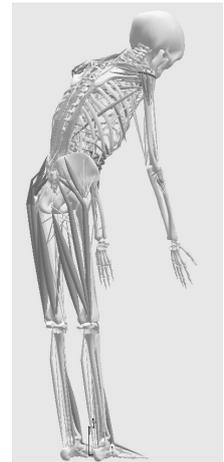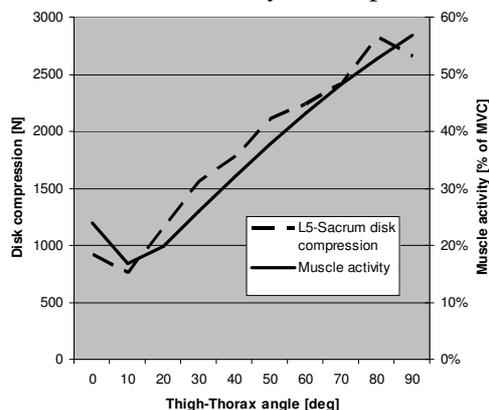
Fig. 2. Effect of posture on body load.

References

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