Can a simple balance task be used to assess fitness for duty?

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Abstract

Human fatigue, caused by sleep loss, extended wakefulness, and/or circadian misalignment, is a major cause of workplace errors, incidents and accidents. In some industries, employees are required to undertake fitness for duty testing at the start of a shift to identify instances where their fatigue risk is elevated, so that minimisation and/or mitigation strategies can be implemented. Individuals who undertake shiftwork at night are particularly at risk of these types of events because they are often exposed to high levels of work-related fatigue. This is largely due to the sleep restriction and sleep disruption associated with sleeping during the daytime, being awake during the normal sleep period, and working through the circadian nadir (Åkerstedt, 2003). Work-related fatigue is an important issue because it can result in reduced alertness and performance, as well as more serious consequences such as greater risk of injury and accident (Dinges, 1995; Dinges et al., 1997). For these reasons, suitable preventive and protective strategies are required to mitigate the adverse effects of work-related fatigue (Costa, 2003). In some industries, fitness for duty testing is used to detect instances where employees may have elevated fatigue risk, so that minimisation and/or mitigation strategies can be employed. However, such tests are only useful if they are sensitive to the major factors that contribute to work-related fatigue, namely disturbed or restricted sleep, sustained wakefulness, and time of day (Folkard and Tucker, 2003).

One particular assessment that has been proposed as a suitable fatigue-related fitness for duty test is postural balance. Maintenance of the upright posture is a fundamental homeostatic mechanism governed by input from the eyes, inner ears, joints, and muscles (Schlesinger et al., 1998; Swift, 1984). The degree to which this system operates efficiently and effectively can be determined from measurements of postural sway or standing steadiness.

1. Introduction

Human fatigue, caused by sleep loss, extended wakefulness, and/or circadian misalignment, is a major cause of workplace errors, incidents and accidents (Dinges, 1995). In some industries, employees are required to undertake fitness for duty testing at the start of a shift to identify instances where their fatigue risk is elevated, so that minimisation and/or mitigation strategies can be implemented. Individuals who undertake shiftwork at night are particularly at risk of these types of events because they are often exposed to high levels of work-related fatigue (Dorrian et al., 2008). This is largely due to the sleep restriction and sleep disruption associated with sleeping during the daytime, being awake during the normal sleep period, and working through the circadian nadir (Åkerstedt, 2003). Work-related fatigue is an important issue because it can result in reduced alertness and performance, as well as more serious consequences such as greater risk of injury and accident (Dinges, 1995; Dinges et al., 1997). For these reasons, suitable preventive and protective strategies are required to mitigate the adverse effects of work-related fatigue (Costa, 2003). In some industries, fitness for duty testing is used to detect instances where employees may have elevated fatigue risk, so that minimisation and/or mitigation strategies can be employed. However, such tests are only useful if they are sensitive to the major factors that contribute to work-related fatigue, namely disturbed or restricted sleep, sustained wakefulness, and time of day (Folkard and Tucker, 2003).

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