Accident Analysis and Prevention 45S (2012) 1–5

Contents lists available at SciVerse ScienceDirect

Accident Analysis and Prevention

journal homepage: www.elsevier.com/locate/aap

Editorial

Fatigue research in 2011: From the bench to practice

A B S T R A C T

Over the last 20 years, academic, industry and community stakeholders have been meeting at a biennial scientific conference to discuss fatigue-related research and policy in the transportation, resources and health sectors. During this period, the research conducted around the world has progressed substantially: we now better understand the basic processes of sleep and circadian physiology that underpin performance; we better understand that fatigue risk management in the absence of any discussion about sleep is fruitless at worst and inadequate at best; and we are improving the capacity of models and other technologies to assist us to predict, monitor, identify, minimise and mitigate fatigue-related risk. At the same time however, the relationship between performance on simple cognitive tasks in laboratory settings and performance on complex tasks required to operate efficiently and safely in the workplace, remains a stumbling block. This special issue brings together fifteen papers that cover the range of areas in the field of fatigue research and challenges us as researchers, regulators, industry representatives and community members to continue the work of managing the risk of fatigue.

1. Introduction

In this special edition of *Accident Analysis and Prevention*, the editors have chosen a group of papers presented at a recent fatigue conference held in March 2011 in Fremantle, Western Australia. These papers showcase recent developments in fatigue science and fatigue-risk mitigation in the transportation, resources and health industries. The conference is one of the longest running international conferences focused on fatigue. It was first convened by Laurence Hartley in 1992 and has been held every 2–3 years since then in either Australia or the United States.

The conference remains relatively unique as it brings together all of the key stakeholders in the area to discuss fatigue in a collaborative multi-disciplinary forum. Scientists, industry representatives and regulators share their thirst for knowledge and discuss the causes and consequences of fatigue as well as the latest regulatory and technological developments for reducing fatigue-related risk.

The special issue presents 15 papers that illustrate the growth and diversity of research in the field over the last two decades. Since the first meetings of this group nearly 20 years ago, our understanding of the basic science of fatigue has increased significantly and community attitudes have changed fundamentally. We have a more detailed understanding of the basic physiology of the sleep and circadian systems and the effects of fatigue on simple task performance have been well documented. We have an emerging capacity to model the way in which work schedules shape subsequent sleep and wakefulness and the effect on sleepiness and simple task performance. Most recently, we have developed some very promising technologies that enable us to estimate monitor, identify and protect fatigued workers who are at risk.

During those 20 years of research, community, government and regulatory attitudes to fatigue have changed significantly, especially within the developed world. In 1992, when the conference first convened, many in the general population struggled to understand what the fuss was about. Regulatory authorities often saw fatigue as an industrial issue rather than a safety concern. In that era, it was still considered reasonable to address employee concerns about fatigue through the use of penalty payments and/or over-time premiums. Fatigue was seen primarily as one of the social costs of shift work.

Now, two decades on, fatigue is a clearly identified hazard under OH&S legislation and, in many developed countries, organisations are routinely required to develop and implement a fatigue risk management system with the same degree of rigour and procedural complexity as they would for long-accepted hazards such as carcinogenic chemicals or manual handling.

On the other hand, some areas of the field have remained remarkably static. Our understanding of the effects of fatigue on complex task performance at the individual or team level has not moved forward anywhere near as fast. As a field, we continue to over-simplify the effects of fatigue. Many still equate real world task performance with simplistic measures of response times or hand eye co-ordination despite significant evidence to the contrary (Gander et al., 2008; Dawson et al., 2011a).

Similarly, many of our frameworks for controlling or regulating fatigue-related risk remain essentially unchanged over that same period. Despite 30 years of research to the contrary, 19th century regulatory and industrial policy architectures remain our preferred tool for reducing fatigue-related risk in most industries. Rules originally designed to reduce physical fatigue by controlling shift and break times along with aggregate working hours continue

0001-4575/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.aap.2011.09.016