

## VIEWPOINT

# Medical Aspects of Fitness to Drive in the Developing World: Time to Act!

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## Abstract

Driving of motor vehicles is a highly coordinated process involving a series of learned reflexes and carefully made conscious decisions. Many medical conditions with cognitive dysfunction, neuromuscular coordination or vision consequently affect driving safety. The medical profession, transport authorities and regulatory bodies have been interested in the medical aspects of fitness to drive. Legislations have been established in almost all developed countries. Good examples include legislations in North America, Europe and Australia. Sadly the global situation is not as promising. There is an urgent need for the rest of the world to adopt the latest evidence-based and well-tested guidelines, legislations and experiences from the developed countries in this area. Raising the awareness among the public, professionals and regulators about the importance of the issue is urgently needed.

**Key Words:** Motor vehicle, Drivers, Transport, Driving

safety legislation, Hypoglycemia, Diabetes. Fitness to drive, Developing world.

## Introduction

Driving of motor vehicles is a highly coordinated process. It involves a series of learned reflexes and carefully made conscious decisions. Medical conditions which inhibit cognitive dysfunction, neuromuscular coordination or vision may affect driving safety (1-3). Several medical conditions have been identified as putting the drivers, road users and others members of the public at serious and avoidable risk of being involved in motor vehicle accidents in one shape or form (Table 1). Consequently, the medical profession, transport authorities and regulators have been interested in the medical aspects of fitness to drive for long time and legislations have been established in the developed countries (1-3). Fairly sophisticated levels of regulation have been passed and a process of complex plans are in place being implemented. Examples are legislations in

**Table 1.** Some of the common medical conditions that are widely recognized to affect driving safety. The extent of driving restrictions are country/region-specific.

Arthritis and other joint conditions
Diabetes on insulin treatment associated with increased risk with hypoglycemia,
Poor eyesight: loss of vision acuity and vision fields
Epilepsy
Eye disorders such as glaucoma, cataracts, macular degeneration
Cardiovascular conditions including high/low blood pressure
Heart disease
Injuries and disabilities, including limb amputation or paralysis
Parkinson's disease
Other neurological disorders
Sleep disorders like apnea
Stroke



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## DUBAI DRIVER'S MEDICAL STANDARD

**This document is provided by the Dubai Roads and Transport Authority and the Dubai Health Authority for the guidance of Medical Professionals in the medical assessment of drivers.**

**Figure 1.** The cover page of the driver's medical standard adopted by Dubai Government (UAE) based on a UK guidelines following a very high profile fatal road traffic accident caused by a young type 1 diabetic patients who drove through red traffic light due to hypoglycemia. Available at: [http://www.rta.ae/wpsv5/links/Medical\\_Standard\\_Dubai.pdf](http://www.rta.ae/wpsv5/links/Medical_Standard_Dubai.pdf)

North America, Europe and Australia (1-3).

Several excellent review articles have been written on the medical aspects of fitness to drive with particular emphasis on specific conditions such as diabetes, Parkinson's disease, dementia and epilepsy and in the elderly (4-9). These

articles have reflected on better understanding of various problems, research evidence, highlighting the changes in clinical practices with the availability of new and emerging therapies. This editorial is not an attempt to review the literature on the medical aspects of fitness to drive but rather an attempt to highlight the importance of oh this

topic for developing countries to take steps towards better regulation of the driving privileges of people with diabetes and learning from the western experiences.

### **Medical Aspects of Fitness to Drive**

#### ***The Principles and Evidence Base***

A large number of studies have attempted to assess how various health conditions of drivers increase the risk of their involvement in accidents. Elvik proposed a framework for a critical assessment of the quality of these studies from a methodological point of view (10). Examples were given of how various sources of bias and confounding can produce study findings that are highly misleading. He identified ten potential sources of error and bias in epidemiological studies of the contribution of driver health impairments to road accidents. These included 1) poor description of the medical conditions whose effects are studied (measurement error), 2) inadequate control for the effects of exposure on accident rate, 3) Sampling indigeneity with respect to assessment for fitness to drive (i.e. outcome-based sampling; self-selection bias), 4) combined exposure to several risk factors, 5) poor control for potentially confounding factors, 6) failure to specify potentially moderating factors (i.e. interaction effects), 7) failure to consider a severity gradient with respect to the effect of health impairments, 8) failure to specify the compliance of drivers with medical treatments or treatment effectiveness, 9) lack of data on the population prevalence of various health conditions and 10) the use of multiple study approaches and methods making the comparison and synthesis of findings difficult. He gave examples of how all these items may influence the findings of a single study or make synthesizing findings from multiple studies difficult and he provided a checklist for assessing study quality.

Molnar et al. (11) attempted to provide a background for physicians' in-office assessment of medical fitness to drive, including legal risks and responsibilities. They reviewed opinion-based approaches and current attempts to promote evidence-based strategies for this assessment. More than 1500 articles, on health-related and medical aspects of fitness to drive, have been published. More than 1500 papers were reviewed to find practical approaches to, or guidelines for, assessing medical fitness to drive in primary care. Only level III evidence was found and evidence-based approaches were available. Three practical methods of assessment were highlighted the American Medical Association guidelines, SAFE DRIVE, and CanDRIVE. The authors concluded that no evidence-based information

exists to help physicians make decisions regarding medical fitness to drive and that current approaches are primarily opinion-based and are of unknown predictive value.

The principle underlying assessment of fitness to drive is twofold. Firstly to ascertain the presence of certain medical conditions that can put the driver himself to risk and endanger other members of the public; for this, there is a plenty of guidance (Table 1). Secondly, to evaluate these medical conditions with view to assessing their severity and any impact on driving safely. This later task needs more expertise and condition-specific knowledge.

#### ***The Practical Aspects***

Predictably, medical practitioners would be required to assume the responsibility for assessing fitness to drive. In undertaking these tasks it is not clear how capable these practitioners are in performing this role. In 2007, Shanahan et al. (12) determined the clinical practice, knowledge and attitudes of public hospital doctors in the area of fitness-to-drive decision-making. A survey of public hospital doctors in Adelaide, South Australia was undertaken in 2003, shortly after the promulgation nationwide of guidelines to assist in the assessment of patients' fitness to drive. They demonstrated that hospital doctors have poor knowledge of the content of published guidelines in the area of fitness to drive. If this situation is to be improved, alternative approaches to the education of this group with respect to this significant public health problem should be considered. Many doctors are uncomfortable with their responsibilities in this area and alternative models of decision-making should be considered.

Furthermore, Hawley et al conducted a survey of all UK medical schools (13). Two thirds of schools reported specific teaching on medical aspects of FTD but few covered it in depth or in relation to specific medical conditions. Only one school taught FTD in relation to elderly medicine. FTD was an examination topic at only 12 schools. Thus teaching on FTD is inconsistent across UK medical schools and many new doctors will graduate with limited knowledge of medical aspects of FTD. It is, therefore, not surprising to find that medical students and doctors tend to lack confidence regarding the medical aspects of FTD and DVLA medical standards. In response to this inconsistency an innovative new learning module was developed to teach medical students the importance of giving appropriate advice to patients about driving, the role of the DVLA regarding medical aspects of FTD, how

to recognize when patients should be referred to a driving assessment center and what adaptations are available to allow patients with physical disabilities to drive safely (14).

It is noteworthy that the legislations in the developed countries are dynamic. For example, the European Union Third directive on driving (2006) has necessitated changes in statutory regulations for driving licenses for people with diabetes in all European States, including the UK. Stricter criteria have been introduced for Group 1 vehicle licenses while those for Group 2 licenses have been relaxed. Insulin-treated drivers can now apply to drive Group 2 vehicles, but in the UK must meet very strict criteria and be assessed by an independent specialist to be issued with a 1-year license (15).

### The Current Status in the Developing World

Sadly the global situation is not as promising. Though it is getting old, a global survey in 1993 revealed lack of regulation of driving by people with diabetes in many countries even in taking up jobs as risky as heavy good vehicles (HGV) and public transport vehicles (16). This international survey studied the licensing policies applied to professional lorry drivers with diabetes treated with insulin. Responses from 24 countries indicated that regulations differ considerably; ranging from a complete ban on professional driving to no restrictions at all. Many reasons may explain this difference, including the lack of data on the effects of hypoglycaemia on the incidence of traffic accidents. A proper account of the risks of diabetic drivers is necessary to balance fairly the rights of employment against the risks. There is currently severe lack of information on the regulations and practices with regard to driving. Only a few reports are related to the situation in the developing countries (17-19). A recent critical review from South Africa highlighted that there are no rulings that allow for a rational decision as to when a diabetic is medically fit to drive. They cited The Road Traffic Ordinance simply stating that 'Patients with uncontrolled diabetes should be forbidden to drive'. However, they could not find any guidelines as to what constitutes 'uncontrolled diabetes'. There were no known actual statistics for South Africa (20).

### The Way Forward

It is time to act and address this important topic in a responsible manner. A particular group of vulnerable drivers in need of urgent regulation are a group of diabetics who are at increased risk of hypoglycaemia (add a reference of DVLA driving and diabetes guidelines).

Based upon the increasing frequency of diabetes of both types in the developing world, the wider increased use of hypoglycaemic therapies including insulin and the expanded usage of motor vehicles of all sorts in developing countries, there seem to be an urgent need to take action. There is no need to "reinvent the wheel". Developing countries who wish to catch up can readily adopt the latest evidence-based and well tried and tested guidelines, legislations and experiences from the developed countries or regions such as the European, UK or Australian, Canadian Guidelines provide excellent examples to follow. A pragmatic approach was the adoption of the UK guidelines almost in their entirety by the Government of Dubai in the United Arab Emirates (Figure 1). Such approach will certainly save time and effort and avoids any teething mishaps. It was previously proposed elsewhere that any rational guidelines on driving for diabetics on insulin will need to be based on international experience (20), mostly gleaned from the USA and Western Europe (1-3). Most certainly, the status quo of complacency and turning a blind eye on such major issues in the developing world can no long be sustained. We propose that regional and international agencies take the lead in facilitation of sharing experiences between north and south. In the first instance, perhaps raising the awareness among the members of public, health care professionals and licencing regulators about the importance of the issue is urgently needed. Reviews of the current challenges and potential solutions of medical aspects of driving safety can be easily incorporated in relevant continuous medical education programs for diabetologists, neurologists, and geriatricians.

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