

DRIVING WITH UPPER EXTREMITY IMMOBILIZATION: A COMPREHENSIVE REVIEW



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Background

Driving with upper extremity immobilization is potentially dangerous. The aim of this study is to review current medical literature, state laws, and guidelines on driving with upper extremity immobilization in order to provide a comprehensive review of the available evidence.

Methods

A literature search was conducted using MEDLINE to identify all English language citations related to driving with upper extremity immobilization. Potentially relevant articles were identified, and bibliographies of articles were reviewed to capture articles not initially identified. Additionally, a law literature search was completed. LexisNexis, HeinOnline, and Westlaw Classic databases were searched for relevant articles, state statutes, codes, and regulations. Each state's Department of Motor Vehicle handbook was reviewed.

Results

- 5 studies with subjective and/or objective assessments
- 2 evaluated only below-elbow immobilization
 - One found driving in a wrist splint had no effect.
 - The other supported driving in a splint is safe under non-hazardous circumstances.
 - 3 studies evaluated both below and above-elbow immobilization
 - All recommended against driving in a left above-elbow splint.
 - Two found a trend toward worse driving in both below and above-elbow splints.

- 1) American Medical Association and National Highway Traffic Association have a joint recommendation pertaining to older drivers which recommends referral to a rehabilitation specialist for evaluation if concerned.
- 2) US Public Health Service recommends normal motor function and adequate mobility of both upper extremities and a performance examination when physically impaired.
- 3) US Department of Transportation recommends a performance evaluation using a trained driving tester to determine fitness of *commercial* motor vehicle drivers with musculoskeletal disorders.
- 4) There are no state statutes or multi-jurisdictional surveys on the topic.

Conclusions

We present a review of the medical and law literature on driving with upper extremity immobilization. This study finds that driving is hindered in some splints, that there are substantial variations in physician practice patterns, that there are no formal guidelines for physicians and patients to consider, and that there is a paucity of published literature on this topic in the United States. We believe both physicians and patients would benefit from evidence-based recommendations or practice guidelines.

TABLE 1. Characteristics of Studies Included

Author, Year	Location	Driving Test				Survey		
		Type of splint	Splint Side	Vehicle Drive Side	No. of Subjects	Physicians	Patients	Insurance Company, Law Enforcement, and/or DVLA
Stock et al., 1970	United States							
Giddins et al., 1996	United Kingdom							X
Rees et al., 2002	United Kingdom					X		
Blair et al., 2002	United Kingdom	Below-elbow	Right, Left	Left	1			X
Hobman et al., 2004	United Kingdom					X	X	X
Nunez et al., 2004	United Kingdom							X
Von Arx et al., 2004	United Kingdom					X		X
Kalamaras et al., 2006	Australia	Below-elbow, Above-elbow	Right, Left	Left	1		X	X
Kennedy et al., 2006	Ireland						X	X
Chen et al., 2008	United States					X	X	
Gregory et al., 2009	United Kingdom	Below-elbow	Right, Left	Left	8			
Edwards et al., 2009	United Kingdom						X	
Chong et al., 2010	United States	Below-elbow, Above-elbow	Right, Left	Right	30			
Stevenson et al., 2013	United Kingdom	Below-elbow, Above-elbow	Right, Left	Left	6			