

# Ability to Drive in Patients with Dizziness: The Belgian Perspective

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## ABSTRACT

Dizziness is one of the most frequent complaints of patients and up to 20% consult physicians for it every year. Patients can suffer from different types of symptoms, including spontaneous vertigo spells, head-movement-induced vertigo spells and chronic dizziness. All of these symptoms are highly relevant while driving and may put the patient and their surroundings in significant danger. This paper highlights the impact of aspects relevant to the dizzy patient on driving ability (incl. the impact of medication and surgery).

**Keywords:** Dizziness, pharmaceutical preparations, risk, accidents, attention

## Ability to Drive in Dizzy Patients

Dizziness is one of the most frequent complaints of patients and up to 20% consult physicians for it every year.<sup>1</sup> Patients can suffer from different types of symptoms, including spontaneous vertigo spells, head movement-induced vertigo spells, and chronic dizziness.<sup>2</sup> In case of Menière's disease, vertigo spells can occur unexpectedly without warning or can be preceded by prodromic symptoms (including hearing loss and/or tinnitus). Benign paroxysmal positional vertigo can be elicited by specific head movements, will last only seconds to minutes, but can still cause disorientation during the vertigo spell. Bilateral vestibulopathy (bilateral loss of vestibular input) leads to chronic dizziness due to impairment of the vestibulo-ocular reflex and decreased dynamic visual acuity. All of these symptoms are highly relevant while driving and may put the patient and their surroundings in significant danger. A systematic review has been published recently by Uwents et al<sup>3</sup> and provides a comprehensive overview of the literature on driving ability in dizzy patients.

## Belgian Legislation on Driving Ability in Case of Dizziness

Traffic safety is prioritized by the government. Strict guidelines and regulations have been defined for alcohol intoxication, speeding, the use of mobile phones, safety belt use, and so on. However, when it comes to the ability to drive, the regulations are relatively vague.<sup>4,5</sup> Annex 6 of the Belgian Royal Decree of 23 March 1998 concerning the driver's license stipulates the conditions on driving ability related to legal and illegal drugs and medicines.<sup>6</sup> Two groups are distinguished: group 1 (car ± trailer, tractor) has a driver's license for vehicles in category AM, A1, A2, A, B, B+E of G and group 2 (truck and bus drivers) has a driver's license for vehicles in category C1, C1+E, C, C+E, D1, D1+E, D of D+E. Noteworthy is that hearing loss is not considered as a factor that might impair the ability to drive, unless concomitant vestibular symptoms are present. With regard to dizziness, patients in group 1 suffering from a disorder of the vestibular system that produces sudden vertigo spells or sudden onset of dizziness are considered unsuitable for driving.

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The patients in this group need to be referred to an otorhinolaryngologist for advice on the ability to drive and its duration. Patients in group 2 need a document from their otorhinolaryngologist to certify that they are able to drive.

### Confounding Factors in Driving Ability

With respect to patients presenting with dizziness or those who are under treatment, several factors have to be taken into account. First of all, driving anxiety is experienced by many older adults. A large proportion of elderly report driving anxiety and associated different driving patterns, for example, they drive less often for shorter distances or use alternative modes of transportation.<sup>7</sup> Attention capacity has been reported as an important factor for driving,<sup>8</sup> a factor that has been demonstrated to be significantly impaired, especially in patients suffering from bilateral vestibulopathy.<sup>9-12</sup> Attention deficits may influence cognitive and motor dual tasks that are relevant while driving.<sup>8,13-16</sup> Patients with vestibular symptoms may develop anxiety and depression and in that sense may have an additional effect on driving ability.<sup>17</sup>

### Medication and Ability to Drive

Driving ability (and the ability to operate heavy machinery) has been a major concern for the European Medicines Agency (EMA) and one of the topics that is systematically mentioned in the side effect profile of drugs. The effects on driving ability—and advice issued by EMA—of the drugs most frequently prescribed in a neurotology unit for dizziness has been summarized in Table 1. A systematic review and meta-analysis was performed within the framework of the DRUID project (Driving Under the Influence of Drugs, Alcohol and Medicines in Europe) studying the impact of antipsychotics, anxiolytics, hypnotics, sedatives, antidepressants, and antihistamines on driving and skills related to driving.<sup>18</sup>

One of the most often prescribed drugs for Menière's disease is betahistine. A blinded prospective study, with randomization and cross-over design, was performed in healthy participants taking 72 mg of betahistine 3 times a day. No statistically significant differences could be detected, compared to placebo, when studying actual driving tasks (including weaving and gap estimation) and psychomotor tasks (including reaction time and kinetic visual acuity).<sup>19</sup> Antihistamines, in particular the most ancient molecules which have the most pronounced vestibuloplegic effects, are often prescribed to minimize the effects of a spontaneous nystagmus in the first 48 hours after surgery and can cause significant sedation.<sup>20</sup> Diuretics are also prescribed in patients with Menière's disease and can potentially result in orthostatic hypotension or syncope. Beta-blocking agents, often prescribed in patients suffering from vestibular migraine,<sup>21</sup> have a similar side effect

profile and can frequently induce orthostatic hypotension (or syncope) in patients. It is helpful to know that the American College of Cardiology and American Heart Association have issued guidelines for patients with orthostatic hypotension and syncope.<sup>22</sup> Carbamazepine and oxcarbazepine are drugs that can be prescribed for microvascular compression of the vestibulocochlear nerve, also known as vestibular paroxysmia.<sup>23,24</sup> Under both drugs, driving performance has been observed to be worse than at baseline, even in healthy volunteers.<sup>25</sup> Tricyclic antidepressants, such as amitriptyline or nortriptyline, are prescribed to treat patients with vestibular migraine or proprioceptive cervicogenic vertigo but can have a significant effect on driving ability.<sup>26</sup> Although conflicting data have been published on driving performance in stable outpatients who are treated for depression,<sup>27</sup> antidepressant medication is known to produce changes in driving ability.<sup>28</sup> Two recent systematic reviews have studied the correlation between antidepressant drug use and driving.<sup>29,30</sup> Although these studies indicated a negative effect of antidepressants on driving, the epidemiological designs could not exclude the possibility that the underlying illness, generally major depression, is the culprit.

### Neurotological Surgery and Ability to Drive

In the early period after inducing acute unilateral vestibulopathy through surgery or chemolabyrinthectomy, spontaneous nystagmus will also prohibit driving. Surgical treatment of lesions in the cerebello-pontine angle needs to be considered as well: a well-known example is the management of vestibular schwannoma. After surgical removal, 30% have experienced driving problems in the postoperative period, and over 80% experienced difficulties at night.<sup>31,32</sup> In another study, of 300 respondents—who were car drivers before surgery—84% resumed their old driving habits after a break. Another 10% continued driving but with limited ability; 6% chose or felt forced to give up driving altogether.<sup>33</sup> The Royal Decree of March 23 1998 stipulates that the patient whose functional, sensory, cognitive, or motor skills are impaired by a surgical procedure due to an intracranial disorder can only resume driving 6 months after the functional impairment. This is important with regard to the patients who undergo microsurgical resection of a vestibular schwannoma, although no studies have been performed to provide direct evidence that compensated unilateral vestibulopathy (as a sensory impairment) impairs driving ability. Using whiplash injury as a surrogate outcome measure for traffic accidents in a sample of over 5 million subjects, Huppert et al<sup>34</sup> found no rationale for driving restrictions.

### Concluding Remarks

Dizziness can have a significant effect on the ability to drive, which should be discussed with the patient. Relevant individual aspects—such as age, anxiety, and medication use—need to be considered carefully in the evaluation of the ability to drive. There is a need for prospective studies in populations with different vestibular disorders (vertigo spells vs. chronic dizziness) using subjective and objective outcome measures that have been validated for their ability to evaluate driving performance. Based on these studies, common international

#### Main Points

- Dizziness can potentially impair the ability to drive.
- Medication and psychiatric comorbidities can further impair fitness to drive.
- Research is needed to enable objective evaluation of driving skills in dizzy patients.

**Table 1. Effects of frequently used drugs on driving ability and advice issued by the european medicines agency (ema), reported by the heads of medicines agencies (HMA)**

<b>Vestibular Disorder</b>	<b>Drug</b>	<b>Effects on Driving Ability</b>	<b>Advice Issued</b>
Vestibular neuritis	Antihistamine: droperidol, dehydrobenzperidol (DHBP)	Major effect on the ability to drive and use machines.	Do not drive or use machinery for at least 24 hours after taking DHBP.
Motion sickness	Antihistamine: cinnarizine/dimenhydrinate	May make you feel sleepy.	If sleepiness occurs, you should not drive or operate machinery.
Menière's disease	Corticosteroid: methylprednisolone (1 mg/kg)	The possibility of muscle weakness, muscle atrophy, and mood changes should be taken into consideration when driving and using machines.	If you have side effects such as dizziness, visual disorders, and fatigue, you may not drive vehicles or use machines.
	Histamine analog: betahistine dihydrochloride	Not likely to affect your ability to drive and use tools or machinery.	Remember that the disease for which you are treated (Menière's disease) can make you feel dizzy or being sick and can affect your ability to drive and use machines.
	Carboanhydrase inhibitor/diuretic: acetazolamide	May impair the ability to perform tasks requiring mental alertness and/or physical coordination.	Avoid driving and doing other tasks or actions that call for you to be alert or have clear eyesight until you see how this medicine (acetazolamide tablets) affects you.
	Diuretic: amiloride/hydrochlorothiazide	Tiredness, dizziness, or drowsiness, which possibly can impair your ability to manage traffic or to use equipment requiring precision, may occur during treatment with diuretics. Such symptoms usually occur at the initiation of treatment or after increasing the dose. During times of good therapeutic equilibrium, they are not likely to appear.	N/A
Vestibular migraine	Anticonvulsant: topiramate	Dizziness, tiredness, and vision problems may occur.	Do not drive or use any tools or machines without talking to your doctor first.
	Calcium channel blocker: flunarizine	Somnolence may occur, especially at the start of the treatment.	Caution should be exercised during activities such as driving or operating dangerous machinery.
	Betablocker: propranolol	Unlikely to affect the ability to drive or to operate machinery. However, some people may occasionally feel dizzy or tired.	When feeling dizzy or tired, ask your doctor for advice.
	Tricyclic antidepressant: nortriptyline	May affect alertness.	Use caution when driving or operating heavy machinery until you are aware of how this drug affects you. If you feel it affects your ability to drive or use machines, tell your doctor immediately.
Persistent postural-perceptive dizziness	Selective serotonin reuptake inhibitor: sertraline	Psychotropic medicines such as sertraline may influence your ability to drive or use machines.	You should therefore not drive or operate machinery, until you know how this medicine affects your ability to perform these activities.
Vestibular paroxysmia	Anticonvulsant: carbamazepine	Major influence on the ability to drive and use machines. It affects patients' reactions, causing dizziness, drowsiness, fatigue, ataxia, double vision, blurred vision, especially in the early stages of treatment. This may be further influenced by higher dose levels or the use of carbamazepine in combination with other centrally acting drugs or in conjunction with alcohol consumption.	Patients should be warned of the possible hazards when driving or operating machinery.

guidelines could be created to evaluate the ability to drive in dizzy patients.<sup>3</sup>

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