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DRUID
Driving under the Influence of Drugs, Alcohol and Medicines

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Guidelines & Professional Standards

Report and CD with examples of ICT supported protocols for prescribing and dispensing of medicines affecting driving performance, and for informing patients who use other psychoactive substances than medicines

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Task 7.2.2.

Guidelines and Professional Standards

Report and CD with examples of ICT supported protocols for prescribing and dispensing of medicines affecting driving performance, and for informing patients who use other psychoactive substances than medicines.

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List of Abbreviations

Abbreviation	Full Description
AAN	American Academy of Neurology
AD	Alzheimer's disease
AMA	American Medical Association
CDS	Clinical Decision Support
CDSS	Clinical Decision Support Systems
CDR	Clinical Dementia Rating
CMA	Canadian Medical Association
CNS	Central Nervous System
CPME	Standing Committee of European Doctors
CPOE	Computerised Physicians Order Ebtry System
D- …	Deliverable
DVLA	Driving and Vehicle Licensing Agency
DRUID	Driving Under the Influence of Drugs, Alcohol and Medicines
EFTA	European Free Trade Association
EU	European Union
EPS	Extrapyramidal Side Effects
GPs	General Practitioners
ICD	Implantable Cardioverter Defibrillator
ICT	Information and Communication Technology
MESH	Medical Subject Headings
NaSSA	Noradrenergic and Specific Serotonergic Antidepressant

PD	Parkinson's disease
PGEU	Pharmaceutical Group of the European Union
RUGPha	University of Groningen, Pharmacy
SNRI	Serotonin-Norepinephrine Reuptake Inhibitor
SSRIs	Selective Serotonin Reuptake Inhibitors
TCAs	Tricyclic Antidepressants
UK	United Kingdom
WP	Work Package

Executive Summary

Deliverable 7.2.2 contains examples of ICT-supported protocols for prescribing and dispensing of medicines affecting driving performance, and for informing patients who use other psychoactive substances than medicines.

In order to develop these professional guidelines, a literature search (Chapter 2) was conducted. As few prescribing and dispensing guidelines were found in the medical and pharmaceutical literature, a questionnaire survey among National Associations of Physicians and Pharmacists (in Europe) was carried out (Chapter 3.2). Additionally, input from other DRUID deliverables (D-7.2.1 and D-7.4.1) containing information related with prescribing and dispensing guidelines for selecting driving impairing medicines in patients who are advised to use psychotropic medicines was included (Chapter 3.1).

Patients taking other psychotropic substances than medicines are another risk group. Driving under the influence of some illicit drugs is a frequent cause of road accidents. It is important to provide information to this specific group, which is presented in Chapter 4.

Considering that General Practitioners (GPs) and pharmacists in most European countries make use of computer software in their daily practice, including information about medicines that influence driving ability is a valuable way of giving advice to the health care provider for counselling his/her patients. The way of applying practice guidelines and protocols in clinical decision support systems that GPs and pharmacists can use daily is shown in Chapter 5. Examples of ICT tools that were developed within DRUID and were adapted and used in Belgium, the Netherlands and Spain to train GPs and pharmacists are presented in Chapter 6. Finally, Chapter 7 includes a list of recommendations for future development of prescribing and dispensing guidelines.

1. Introduction

D7.2.2 is part of DRUID WP7 Task 7.2 “Guidelines and Professional Standards”. The DRUID Technical Annex specifies T7.2 as follows (page 110):

The scope and effectiveness of professional medical and pharmaceutical standards will be discussed with European organisations of physicians and pharmacists. Their reflections will be used as input for the development of a proposal to show how the prescribing and dispensing of medicines affecting driving performance can be guided by applying protocols. Specific attention will be given to the possibilities of using Information and Communication Technology (ICT) in the computerised information systems that physicians and pharmacists use in their daily practice. Specific attention will be given to the role of healthcare professionals in case psychoactive substances other than medicines will be used by their patients.

All drugs acting on the central nervous system can impair alertness, concentration and driving performance. This is particularly frequent at the beginning of the treatment, or soon after, and when dosage is being increased. Driving must be ceased if adversely affected. Any person who is driving or attempting to drive on the public roads under the influence of illicit drugs and/or prescribed psychotropic medicines is liable to prosecution, in most European Union countries.

In order to be able to explain all risks to the patient, physicians and pharmacists need to be well prepared. The existence of prescribing and dispensing guidelines are, with no doubts, good and standardised mean for providing information to healthcare professionals.

Attributing different categories of impairment to medicines is a clear and practical approach to prescribe and dispense the least impairing medicines within the same therapeutic class to patients. Additionally, visual aids – pictograms – reflecting the

categorisation system assist to communicate the risk of driving while taking such medicines. This might help to recognise and deal with the side effects that normally occur during the first days of treatment. Introducing such a grading system in the physicians and pharmacists' computer software is useful to improve patient care, during daily practice.

This deliverable aims to transpose the developed dispensing and prescribing guidelines related with drugs and driving into ICT tools that are accessible to physicians and pharmacists. The existent software systems in Belgium, the Netherlands and Spain were adapted for using DRUID information. The results of the development of these tools are presented, in brief, in this deliverable. The tools can be found in the CD that supplements the present document. The training of physicians and pharmacists is explained in more detail in DRUID Deliverable 7.4.1.

2. Literature review on clinical guidelines related to driving impairing medicines

2.1. Introduction

The need of health care providers to use clinical guidelines for applying results obtained in evidence-base medicine is important to improve the quality of care. This is especially important when medicines are prescribed based on proven efficacy for treating a specific disease or complaints and when medicines are used by patients who want to be engaged in normal daily activities without unwanted disturbances caused by their medication. In case of driving-impairing medicines, such as psychotropic medicines, the balance between desired outcomes and accident risk needs to be assessed before prescribing or dispensing the medication to the patient. Therefore, medical guidelines for prescribing and dispensing medicines shouldn't only focus on selecting the safest medicine for the individual patient, but also on increasing the knowledge about the experiences that patients have while taking the prescribed medication.

Several diseases, such as epilepsy, different types of dementia (including Parkinson and Alzheimer's diseases), cardiovascular diseases, and diabetes are known to affect fitness to drive. For treating these diseases several classes of medicines, especially those acting on the Nervous System (CNS), are known to affect driving performance and be a cause of road accidents as medicines can often cause, for instance, drowsiness, dizziness, sleepiness, slow reaction time or blurred vision. The risk of being involved in a car crash is highest during the first 2 weeks of treatment. Therefore, clinical guidelines should pay special attention to the information that should be given to patients once patients have the right to receive adequate information to enable them to decide whether or not to drive.

Very often physicians are requested to assess someone's fitness to drive for renewal of driving licenses. This needs to be based on strict assessment of fitness to drive examinations that should also be part of clinical (prescribing) guidelines.

The impairment attributed to both diseases and medicines require extra care from physicians, or any other health care provider, when it comes to assess patients' fitness to drive. Explaining the reasons why someone should stop driving is fundamental for the acceptance of and adaptation to the new situation where driving is no longer an option. The aim of this literature review is to reveal what type of prescribing and dispensing guidelines regarding medicines that might affect driving ability are currently available.

2.2. Methods

A systematic literature search of the electronic database Medline was conducted using, as keywords, the MESH terms "Automobile Driving" and "Practice Guidelines as Topic", in combination. The MESH term automobile driving is defined as "the effect of environmental or physiological factors on the driver and driving ability. Included are driving fatigue, and the effect of drugs, disease, and physical disabilities on driving". Practice guidelines as topic are described as "directions or principles presenting current or future rules of policy for assisting health care practitioners in patient care decisions regarding diagnosis, therapy, or related clinical circumstances. The guidelines may be developed by government agencies at any level, institutions, professional societies, governing boards, or by the convening of expert panels. The guidelines form a basis for the evaluation of all aspects of health care and drug delivery".

No limits were applied to the search and a total of 50 articles were retrieved. Six articles [1]-[6] were written in other languages than English and, for that reason, were excluded. Even knowing that the excluded articles dealt with national

guidelines, the authors believe that the topic of the article had been covered in surveys among the national associations of pharmacists and physicians that were conducted as well (for more information, see chapter 3.2 of this deliverable). Nine articles [7]-[15] were not available on-line and only 3 articles [7], [10], [15] mentioned a correspondent author. However, these 3 articles were not found to be of relevance to the literature search and, as a consequence, the authors were not contacted and the articles were not included.

After checking the relevance of the included articles, based on their title and abstract, 2 more articles were considered not relevant for the topic of interest as they dealt with the screening of hypertension [16] and sleep apnoea [17] in commercial drivers. Articles with no reference to guidelines were excluded as well [18]-[19]. After applying the previous exclusion criteria, a total of 28 articles [20]-[48] were reviewed. A manual search on the cited references of the eligible articles was also conducted. Eight more references [49]-[56] were found to be important and of use for the literature search. As a result, 36 articles were used and divided in 2 main subjects (Tables 1 and 2), after being carefully analysed: Table 1 refers to articles dealing with assessment of fitness to drive and Table 2 with medicines that affect driving ability. In both situations, special attention was given to prescribing or dispensing guidelines regarding medicines that might affect driving ability but also to any kind of advice that should be provided to patients when they have any physical condition that prevents them from driving safely or when they are taking driving-hazardous medication(s).

2.3. Results

The majority of the selected articles are American or Canadian studies; therefore, allusions to the American Medical Association (AMA) or to the Canadian Medical Association (CMA) are frequent. Both associations have guidelines available and they help physicians to assess patients' fitness to drive. References to medicines that impair driving ability are, sometimes, available, as well as a clear explanation

about law and enforcement in different American States, when there is litigation. Recommendations and advice to the patient are also mentioned.

The subject of most articles are elderly drivers and their most common diseases, that usually are, by themselves, capable of impairing driving ability. Examples of frequent diseases are dementia, PD, AD and cardiac disease (especially in case of implantable cardioverter defibrillators, ICD).

Prescribing or dispensing guidelines of medicines that affect driving ability were found in articles which primary aim is the assessment of fitness to drive. However, from the manual search that was performed, more related and specific information was gathered. All guidelines and recommendations are summarised in Table 2.

From all articles that were retrieved, 3 general sources of information were mentioned containing guidelines on medicines that may affect driving ability:

- *At a glance guide to the current medical standards of fitness to drive (for medical practitioners)* – DVLA [57];
- *Physician's Guide to Assessing and Counselling Older Drivers* – AMA [58];
- *Driver's Guide* – CMA [59].

At a glance guide to the current medical standards of fitness to drive (for medical practitioners) summarises the national (UK) medical guidelines of fitness to drive and is available to doctors and other health care professionals. The information in the booklet is intended to assist doctors in advising their patients whether or not they should inform DVLA of their medical condition and what the outcome of medical enquiries is likely to be. In the interest of road safety, those who suffer from a medical condition likely to cause a sudden disabling event at the wheel or who are unable to safely control their vehicle from any other cause, should not drive.

These guidelines represent the interpretation and application of the law in relation to fitness to drive following advice from the Secretary of State's Honorary Medical

Advisory Panels. The Panels consist of doctors eminent in the respective fields of Cardiology, Neurology, Diabetes, Vision, Alcohol/Substance Abuse and Psychiatry together with lay members.

Table 1 – Summary of relevant information retrieved from articles dealing with assessment of fitness to drive.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
Neurologic Conditions: Assessing Medical Fitness to Drive [20]. *Review*	Steven H. Yale, Phiroze Hansotia, Dawn Knapp, John Ehrfurth	2003. US	General Practitioner (GPs)	Yes, for epilepsy treatment.	Yes. By using neuropsychiatric assessments (including neuropsychological tests and psychometric examination) and off- and on-road assessments.	Driving after stroke; Driving after traumatic brain injury; Driving with dementia (including Parkinson and Alzheimer's disease and epilepsy)	Yes. About decision making process.	None.
Assessing Fitness to drive – part I [21].	Morris Odell	2005. Australia	General Practitioners (GPs)	No.	No.	Guidelines to assess fitness to drive (depending on the type of driver). Guidelines for epileptic drivers. Guidelines for diabetic drivers. Guidelines for drivers with a cardiovascular disease.	Some advice is included in the guidelines.	None.
Assessing Fitness to drive – part II [22].	Morris Odell	2005. Australia	General Practitioner (GPs)	No.	Yes. To assess visual function (by means of visual	Concerning anaesthesia.	None.	None.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
					acuity). To assess psychiatric conditions (behaviour disorders and drug abuse) – professional opinion is needed. Assess sleep disorders, OSA (Epworth Sleepiness Scale). Assess elderly fitness to drive.			
To drive or not to drive: Roles of the physician, patient, and state [23]. *Editorial*	Kimford J. Meador	2007. US	General Practitioner (GPs), patients and the state.	No.		Guidelines regarding how the physician determines driving competency are not well-established.		Patients have the right to lobby against laws that unfairly discriminate against their disorder. Physicians have a responsibility to assess their patients the best of individual

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
								physician's abilities and to provide counselling to the patient concerning applicable driving laws. The state has a responsibility to balance individual rights and public health, monitor the impact of legislation, and alter policy if it is not working.
DOT Examinations: Practical Aspects and Regulatory [24] *Review.*	Forrest Pommerenke, Kurt Hegmann, Natalie Hartenbaum	1998. US	General Practitioners (GPs).	No.	Yes. Includes the screening done by clinical staff and that consists of obtaining a brief history, taking vital signs and recording any medication the driver is taking. A	Guidance from the Federal Motor Carriers Safety Regulations – lists 13 conditions that can disallow driver certification.	Some recommendations are included in the guidelines.	"Should an accident occur, the physician who examined the driver may be found liable". Physicians and other

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
					physical examination by the physician follows the initial screening.	Guidelines on the screening of patients. Guidelines for special situations such as diabetes mellitus and waivers.		examiners should remember that their primary responsibility is to the public and not to the patient.
Easier-to-use fitness-to-drive guide on way from CMA [25].	Barbara Sibbald	1998. Canada	General Practitioners (GPs).	No.	Yes. The revised guide will list the medical conditions affecting a person's ability to drive in descending order of importance for their association with the risk of causing motor vehicle crashes.	New draft of the "Physicians' Guide to driver examination" (from the Canadian Medical Association). The revised version will not only reflect changes in medicine and the transportation industry but also in the law, and it will provide more supporting data.	The new version (1999) will contain key medical conditions and recommendations .	New information about law and litigation will also be included as there is a change in the legal environment.
American Academy of Neurology (AAN) position	D. Bacon, R. S. Fisher, J. C. Morris, M. Rizzo, M. V.	2007. US	General Practitioner (GPs).	Cognitive and psychomotor effects stemming from the use of	Yes. Evaluation methods for dementia should include cognitive	Guidelines for epilepsy (3-month seizure-free interval is	Health professionals encourage people with mild	AAN supports clarification of physician-immunity

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
statement on physician reporting of medical conditions that may affect driving competence [26].	Spanaki			antiepileptic drugs should be carefully evaluated in all patients with seizures who intend to drive.	tests, simulated driving assessments, and on-the-road evaluations by specially trained health professionals. However, better evaluation tools to assess driver safety are needed.	appropriate).	dementia of the Alzheimer type to stop driving. AAN supports stricter driving and reporting standards for people who provide professional driving services, especially public transportation and hazardous-material drivers.	policies, to make it apparent that a physician should be granted immunity both for reporting and not reporting a patient's condition when such action is taken in good faith, when the patient is reasonably informed of his/her driving risks, and when such actions are documented by the physician.
Medical conditions, medications, and driving [27]. *Editorial*	Bruce P. Brown	1998. Canada	General Practitioners (GPs).	Yes. Benzodiazepines (they increase the risk of having an accident).	No.	Guidelines for limiting driving ability because of some medical condition have	Medical practice recommendations will be generated more and more based on	None.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
				Long-acting benzodiazepines increase the risk of having an accident during the 1st week after beginning the medication.		been proposed (from the Canadian Medical Association, CMA).	literature reviews.	
Driving and dementia [28]. *Clinical Review*	David A. Breen, David P. Breen, John W. Moore, Patricia A. Breen, Desmond O'Neill.	2007. Scotland and Republic of Ireland	General Practitioners (GPs).	No.	Yes. After dementia has been diagnosed, visual acuity, ensuring arthritis does not affect ability, and reviewing medications should be checked. On the road driving assessment is performed on a predetermined test route. The patient is graded on sense about road position, response to road signals, and awareness of	Guidelines from the Driver and Vehicle Licensing Agency if medical conditions could affect driving (focus on age and dementia).	For several conditions (including dementia), doctors should not only advise patients of the possibility of stopping driving but also take steps to ensure that the relevant statutory authorities are informed of breaches of regulation if there is reasonable concern about public safety. Providing written information and advice (such as	A doctor has a duty to inform the licensing authority if there is a reasonable likelihood of danger to other road users when patients will not or cannot inform the agency and continue to drive.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
					other road users.		the leaflet on driving and dementia).	
Dementia and driving: autonomy versus safety [29].	Charlene Hoffman Snyder	2005. US	Nurse Practitioners (NPs).	Yes. Anticholinergics, anticonvulsants, antidepressants, antiemetics, antihistamines, antihypertensivs, antiparkinsonism agents, antipsychotics, benzodiazepine, muscle relaxants, recreational drugs, sedatives and anxiolytics, narcotics and stimulants.	Yes. By means of neuropsychological tests (Mini-Mental State Examination scale, MMSE and Clinical Dementia Rate, CDR); on-road tests, driving simulators and family or caregiver reports.	The Canadian Consensus guidelines recommended that individuals with MMSE scores below 24 are prohibited from driving, pending a complete neurological assessment. The International Consensus guidelines, an evidence-based review, have recommended that anyone with CDR of 2 or 3 be advised not to drive. Even persons with mild dementia (CDR 0.5 or 1) should be assessed by an	Strategies that can be used to facilitate the transition to driving cessation: (a) family members ride with the person at least once a month to check for warning signs of reduced driving ability, (b) the partner or family members assume an increasing driving role to allow the impaired person to adjust to not driving, (c) the impaired driver make plans to ensure the maintenance of social contacts, (d) the driver limit any driving to	The American Medical (AMA) Association policy suggests that when a patient ignores the physician's advice to discontinue driving, it is desirable and ethical to notify the Department of Motor Vehicles (DMV) when there is clear evidence of substantial driving impairment that implies a strong threat to patient and

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
						on-road test. The American Academy of Neurology guidelines state that persons with a CDR of 1 or greater should discontinue driving.	daytime hours and within the neighborhood, and (e) the impaired person move into a retirement center that offers transportation service or move closer to children who can perform driving duties. Recommendations on what NP should do when evaluating patients with Alzheimer's disease are mentioned.	public safety.
Competency Issues in Dementia: Medical Decision Making, Driving, and Independent Living[30].	Nancy R. Barbas, Elisabeth A. Wilde.	2001. US.	General Practitioners(GPs).	No.	Yes. It is part of physician's responsibilities to assess the capacity to drive and educate and intervene when there are medical conditions, medication	GPs must make driving recommendations in patients with epilepsy or dementia. Guidelines recommend that patients with presumed	Some recommendations are included in the guidelines.	Courts have been relatively consistent in holding physicians liable for failing to warn a patient, family

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
					effects, and cognitive or functional impairments that could impact driving safety. Medical history including a review of any medical difficulty that may contribute to diminished cognition (adequate visuospacial skills, and visual attention), mobility, or sensory dysfunction. Use of MMSE scale and CDR (from AAN). Use of functional simulators or on-road tests.	Alzheimer's dementia with a CDR of 1 be instructed not to drive because of an increased risk of an automobile accident. Guidelines also recommend that physicians should inform patients with possible Alzheimer's disease and a CDR of 0.5 that they are at greater risk for driving difficulty than other drivers in their age range.		members, or even the public. The physician should conduct an appropriately thorough examination since failure to properly detect a patient's impairment could potentially be construed as negligence.
How well are clinicians following dementia practice	Craig S. Rosen, Helen C. Chow, Mark A.	2001. US	General Practitioners (GPs).	Yes. Rates of medicines' prescription for different diseases in	Yes. To assess patient' fitness to drive, it is very frequent to performing a	Practice guidelines recommend the use of sertraline as primary	Some recommendations are included in the guidelines.	As required by California law, clinicians routinely informed the

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
guidelines?[31]	Greenbaum, John F. Finney, Rudolf H. Moos, Javaid I. Sheikh, Jerome A. Yesavage			several practices	neurological examination, obtaining a history from the caregiver, and asking the caregiver about patients' functioning.	antidepressant. For managing behaviour, risperidone, haloperidol, olanzapine, and valproate are appropriate.		Health Department of dementia patients who were still driving,
The recognition, assessment and management of dementing disorders: conclusions from the Canadian Consensus Conference on Dementia[32]	Christopher J.S. Patterson, Serge Gauthier, Howard Bergman, Carole A. Cohen, John W. Feightner, Howard Feldman, David B. Hogan	1999. Canada	General Practitioner (GPs).	Yes. Benzodiazepines.			Forty-eight recommendations are offered that address the following aspects of dementia care: early recognition; importance of careful history and examination in making a positive diagnosis; essential laboratory tests; rules for neuroimaging and referral; disclosure of diagnosis;	

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							importance of monitoring and providing support to caregivers; cultural aspects; detection and treatment of depression; observation and management of behavioural disturbances; detection and reporting of unsafe motor vehicle driving; genetic factors and opportunities for preventing dementia; pharmacological treatment with particular emphasis on cognitive enhancing agents.	
Opinions, attitudes and practices of	R. G. Beran, L. A. E. Ainley,	2007. Australia	Neurologists	Yes. How long after anti-epileptic	No.	Guidelines regarding the seizure-free	None.	Currently, patients are expected to

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
Australian neurologists with regard to epilepsy and driving [33].	M. E. Beran			medicines withdrawal is safe to drive.		period before driving depending on the type of epilepsy and on the type of driver (private or commercial).		self-report changes in health status to the licensing authority. Current wording of the general guidelines implies, but does not demand, that doctors must report all at-risk drivers.
Practice parameter: Risk of driving and Alzheimer's disease (an evidence-based review): Report of the Quality Standards Subcommittee of the American Academy of Neurology [34].	Richard M. Dubinsky, Anthony C. Stein, Kelly Lyons	2000. US	General Practitioners (GPs).	No.	Comparison between MMSE and CDR scales for assessment of fitness to drive in patients with Alzheimer's disease.		Patients and their families should be told that patients with AD with a severity of CDR 1 or greater have a substantially increased accident rate and driving performance errors, and therefore, discontinuation of	Decisions regarding license restrictions for drivers with AD must always be made in compliance with appropriate state laws and in consultation with the

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							driving should be strongly considered. Patients and their families should be told that patients with possible AD with a severity of CDR 0.5 pose a significant traffic safety problem when compared to other elder drivers. Referral of the patient for a driving performance evaluation by a qualified examiner should be considered Because of the high likelihood of progression to a severity of CDR 1 within a few years, clinicians should reassess dementia severity and appropriateness	individual patient.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							of continued driving every 6 months.	
Driving ability and Parkinson's disease: Current status of research [35].	Ester I. Klimkeit, John L. Bradshaw, Judith Charlton, Rene Stolwyk, Nellie Georgiou-Karistianis	2009.	Health care professionals	Yes. Dopaminergic medicines and levodopa. Specification of side-effects that influence driving ability.	Driving simulators and on-road driving assessment studies have consistently shown that individuals with Parkinson's disease are impaired on key-driving skills. Specifications on how health professionals can assess fitness to drive in Parkinson's disease patients.	Guidelines for health professionals rarely propose scientific tests or specific regulations regarding the type and severity of symptoms that would designate someone as unsafe driver.	Recommendations on how PD patients can change their driving behavior – reducing the amount of time spent driving, avoiding long distances, driving at reduced speed, avoiding driving at night, avoiding driving in peak-hour traffic and minimizing driving alone.	Medical and health practitioners have to decide whether individuals with medical conditions should be permitted to drive with or without restrictions. In most countries, this responsibility lies with the GP, and frequently, this decision-making places the clinician in a difficult ethical dilemma (doctor-

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
								patient relationship).
Mental impairment and driving licences for elderly people – a survey among Norwegian general practitioners[36]	Anne Breakhus, Knut Engedal	1996. Norway	General Practitioners (GPs).	No.	According to Norwegian GPs' there is a lack of uniformity in issuing a health certificate to elderly drivers and a low use of formal cognitive testing.	In Norwegian GPs' opinion, more concrete guidelines are needed.	There is evidence that age itself is not the decisive factor, rather the higher prevalence of medical disorders with a negative effect on driving.	No.
Resources for evaluating the elderly driver [37] *Letter to the editor*	Ram Kakaiya	1998. US	General Practitioners (GPs).	No.	No.	Guidelines from the Canadian Medical Association represent expert opinions that are usually not supported by scientific data. Nonetheless, the availability and access of these guidelines allow primary care physicians to provide counselling using the most current information.	No.	The legal responsibility of American physicians to report medical conditions to the state authorities varies from state to state. Therefore, it is urgent to have uniform standards or driver's license requirements and

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
								guidelines for physicians to report medically unfit drivers.
Which older patients are competent to drive? Approaches to office-based assessment. [38]	David B. Hogan	2005. Canada	General Practitioner (GPs).	Yes. Anticholinergics, anticonvulsants, antidepressants, antiemetics, antihistamines, antihypertensives, antiparkinsonians, antipsychotics, benzodiazepines and other sedatives and anxiolytics, muscle relaxants, narcotics, and stimulants	Vision (visual acuity), cognition (AMA guide suggests routine use of Trail-Making Part B (TM-B) and the clock-drawing test (CDT) and motor function should be assessed if patients have chronic conditions or if concerns about driving have been raised. CMA advises to assess vision, hearing, slowing of perception, cognition (MMSE – those scoring less than 24 are deemed ineligible to hold driver's licences pending	No.	No.	No.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
					complete neurological assessment), strength, and alcohol consumption and to look for signs of arthritis, chronic obstructive airway disease, arrhythmias and adverse drug effects.			
Assessing and counselling older drivers [39]	Bob Pieper	2006. US	Optometrists	Yes. Antihistamines, antidepressants, or narcotic pain killers	Yes. The assessment should cover vision (far visual acuity, visual fields), cognition (memory, visual perception, visual processing and visuospatial skills, attention, executive skills) and motor function (muscle strength and endurance, range of motion and proprioception).	Reference to AMA guide.	Explain why it is important to stop driving. Explore transportation options and make a transport plan. Follow up at future visits. Any health care provider who advises a patient to retire from driving should note that recommendation in the patient record and check	The legal responsibilities of optometrists vary from state to state, the American Optometric Association (AOA) State Government Relations Center notes. In some cases, health care providers may be

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							for compliance with the recommendation when the patient returns for subsequent office visits.	required to report health conditions that would impair driving, as dictated by the state's mandatory reporting laws and standards of medical practice.
Appropriate vision standards for safe driving: experience of on-road driving assessment [40]	Neryla Jolly	2002. Australia	Ophthalmologists	No.	The ability to hold a license to drive a car, motorcycle or a light rigid vehicle rests with the standard achieved in four vision areas, namely: visual fields, loss of vision in one eye, diplopia and visual acuity (including night driving standards).	The guidelines for visual fields are open to interpretation about what constitutes a fail particularly in the presence of scotomas in the inferior and superior field. Someone with loss of vision in one eye is recommended to not to drive for 3 months, and have mirrors on		

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
						both sides of the vehicle or motor bike. Guidelines also state that a person with diplopia should not drive. The vision defects that have been identified in the guidelines can, in the on-road situation, result in unsafe driver performance. The level of dysfunction stated in the guidelines does not always equate to poor driver performance (e.g. visual field defects).		
Consensus	Task force	2009.	General	No.	Formula to	Restrictions for	(1) Patients	No.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
statement of the European Heart Rhythm Association: update recommendations for driving by patients with implantable cardioverter defibrillators (ICD) [41]	members: J Vijgen, G Botto, J Camm, C J Hoijer, W Jung, JY Le Heuzey, A Lubinski, T M Norekvål, M Santomauro, M Schalij, J P Schmid, P Vardas	Europe	Practitioner (GPs).		quantify the level of risk to drivers with ICDs (Risk of Harm formula)	private and professional[1] driving after implantation or replacement of the ICD (for professional driving, the restriction for driving is always permanent.	receiving ICDs for secondary prevention should be restricted from private driving for 3 months after the index arrhythmia. (2) Patients receiving ICDs for primary prevention should be restricted from private driving for 4 weeks after the implantation of the device. System integrity check is recommended before resumption of driving. (3) Patients who have received an ICD for primary or secondary prevention who subsequently	

[1] Private drivers (group 1) comprise drivers of ordinary motor cycles, cars, and other small vehicles with or without a trailer; professional drivers (group 2) include drivers of vehicles exceeding eight seats excluding the driver.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							receive an appropriate therapy for VT or VF should be restricted from private driving for 3 months after the arrhythmia. (4) Patients who receive inappropriate therapy should be restricted until measures to prevent subsequent inappropriate therapy are taken. (5) Patients with ICDs for primary or secondary prevention are not allowed to drive heavy trucks or buses, or transport passengers professionally. (6) Patients and their family should receive adequate	

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							discharge education and standardised information on driving recommendations. Regular clinical follow-up and cardiac rehabilitation are recommended.	
Driving under the influence of abnormal heart rhythms [42]	No authors mentioned (Harvard heart letter).	2007. US	Cardiologists	No.	No.	States driving restriction period when there is heart rhythm disorders.	For people who have survived a potentially lethal arrhythmia, it makes sense to wait 6 months before driving.	No.
Heart disease, guidelines, regulations, and the law [43]	M. C. Petch	2002. UK	Cardiologists	No.	No.	No.	No.	Any driver who suffers from a disorder which might render him or her liable to such attacks is said to have a "prospective disability",

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
								and should stop driving until the risk has been assessed medically. Examples for the ordinary driver would include epilepsy, recent heart attack, or the implantable cardioverter defibrillator (ICD).
Implantable devices for treating tachyarrhythmias [44]	Timothy Houghton, Gerry C. Kaye	2003. UK	Cardiologists	No.	No.	No.	The UK Driver and Vehicle Licensing Agency recommends that group 1 (private motor car) licence holders are prohibited from driving for six months after implantation of a defibrillator when there have been preceding	No.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							symptoms of an arrhythmia. If a shock is delivered within this period, driving is withheld for a further six months. Any change in device programming or antiarrhythmic drugs means a month of abstinence from driving, and all patients must remain under regular review. There is a five year prohibition on driving if treatment or the arrhythmia is associated with incapacity. Drivers holding a group 2 licence (lorries or buses) are permanently disqualified from driving.	

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
Building the evidence base for postoperative and postpartum advice [45]	Lucas Minig, Edward L. Trimble, Carlos Sarsotti, Mario Sebastiani, Catherine Y. Spong	2009.	Surgeons	Yes. Opiate and nonsteroidal analgesics,	No.	*Guidelines for Perinatal Care* (6th edition) says "for women with a cesarean delivery, Additional precautions may be appropriate such as abstinence from driving motor vehicles".	Opiate analgesics in the postoperative period may cloud the sensorium, leading to drowsiness and/or mistakes while driving. Surgeons have expressed concern that patients might hesitate to brake suddenly for fear of increased postoperative pain. Surgeons have expressed concern that the physical motions associated with driving might cause wound separation or dehiscence. Use of any medication, including opiate analgesics, which cause	Surgeons are responsible for giving advice to their patients about when to resume driving.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							drowsiness, would clearly contraindicate driving an automobile. Recommendations about resumption of driving should be based on cognitive function and analgesic regimen, and not upon unfounded fears of wound complications.	
Driving after musculoskeletal injury. Addressing patients and surgeons concerns in an urban orthopaedic practice [46]	Vincent Chen, Aron T. Chacko, Frank V. Costello, Nicole Desrosiers, Paul Appleton, Edward K. Rodriguez	2008. US	Surgeons and patients	Yes. Narcotics.	No.	No.	We recommend that any policy that is implemented by a physician or practice group should be well documented, printed, and clearly stated to patients early in the physician-patient relationship,	No.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							preferably before a patient inquires about driving again. It should not be so inflexible that it precludes from driving the patients who may not be at risk, but it should be universally applied to all patients.	
Car accidents after ambulatory surgery in patients without an escort [47]	Frances Chung, Nicole Assmann	2008. Canada	Anesthesiologists	Yes. Combinations of commonly used sedative drugs (propofol, midazolam, fentanyl) have significant initial impairment of psychomotor function. Combinations that included midazolam had the most long-lasting effects, but after 3h none	No.	Discharge without an escort is contrary to guidelines issued by professional bodies like the American Society for Anesthesiologists, the Canadian Anesthesiologists' Society, the Association of Anesthetists of Great Britain and the Australian Day Surgery	Education of surgeons, anesthesiologists and nurses regarding the importance of escorts is essential to the success of the discharge policy. It is the obligation of the caregiver not to allow these patients to drive home after anesthesia or sedation.	No.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
				of the regimens showed any relevant effect.		Council.	It is the obligation of the caregiver either to cancel the case, admit the patient to hospital or to arrange for a ride home. Driving after ambulatory surgery cannot be considered safe.	
Getting back in the driving seat [48]	Anthony Summers	2006. UK	Nurses practitioners.	No.	No.	No.	If patients need only medical advice or bandages, driving can be resumed when it feels comfortable for the patient and when he/she can perform an emergency stop without making their symptoms worse. If patients need plaster casts, they shouldn't drive for a minimum of 2 weeks.	DVLA does not need to be notified unless there is a medical condition likely to affect safe driving persists for more than 3 months. In that case, it is the duty of the licence holder or licence applicant to notify the DVLA.
Stable long-term	H. BREIVIK	2006.	General	Yes. Opioids	No.	No.	The patient and	No.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
opioid medication per se does not always cause loss of driving ability: the doctor and patient must consider additional risk factors for unsafe driving. *Editorial* [49]		Norway	Practitioner (GPs) or any other doctors responsible for opioid medication				his/her doctor always share the responsibility for the decision to continue driving a car. The doctor informs the patient in person and in writing about the state of the scientific knowledge of the effects of opioids on driving ability and the regulations made by the authorities of their country concerning long-term and stable opioid medication and driving ability. If a patient on long-term, stable opioid therapy is considering driving a car, he/she should do this only if the opioid dose	

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							has been stable for at least 14 days; he/she should never drive if he/she feels tired, sedated, fatigued, dizzy, sleepy; he/she should always report to the doctor when feeling tired, sedated, or fatigued and discuss with the doctor the possibility of reducing the opioid dose; and he/she must never combine opioid medication with alcohol, sedative, anxiolytic, or any other psychoactive medication.	
Should people taking opioids for medical reasons	James P. Zacny	1996. US	Prescribers, in general	Morphine-like agonists, like morphine,	No.	No.	The opioids that are most likeiy to be taken for pain	No.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
be allowed to work and drive? *Editorial* [50]				heroin, hydromorphone, mepiridine and methadone.			relief or heroin pharmacotherapy do not cause marked psychomotor or cognitive impairment. People who are on stable doses of opioids for an extended period of time, including cancer patients and people taking methadone for the treatment of heroin abuse, show little if any impairment to morphine-like opioids, suggesting that some sort of tolerance or habituation occurs. Long-term analgesic medication with stable doses of morphine does	

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
							not have psychomotor effects of a kind that would be clearly hazardous in traffic.	
The cognitive effects of opioids in chronic non-cancer pain. *Review* [51]	Sally Elizabeth Kendall, Per Sjøgren, Cibele Andrucioli de Mattos Pimenta, Jette Højsted, Geana Paula Kurita	2010. Denmark, Sweden, Brazil.	Healthcare providers.	Opioids.	Systematic assessment can be useful to monitor cognitive function over time and may guide adjustment of medications. The test should be of short duration and easy to administer, and should be suitable for the patient's situation. Mini-mental state examination is probably still the most used and translated tool tp assess mental function. Short-term memory,	No.	Inform patients and their families about possible side effects and long-term consequences of opioid use including cognitive dysfunction. Healthcare providers should be alert to signs of cognitive dysfunction especially in patients who are driving or working or have demanding leisure activities.	No.

Article's title	Author(s)	Year / Country	Addressed to:	Reference to medicines	Assess fitness to drive?	Guidelines about:	Recommendations	Law / Enforcement
					attention/vigilance and psychomotor speed are cognitive domains that should, as well, be assessed. Digital symbol substitution, trail making, stroop task, finger tapping and continuos reaction time enable to assess even subtle cognitive deficits.			

Table 2 - Summary of relevant information retrieved from articles dealing with medicines that affect ability to drive.

Article's title	Author(s)	Year / Country	Medicines or and/or class(es) of medicines	Guidelines related to disease(s)	Recommendations to be used in Guidelines
Benzodiazepines: Effects on Human Performance and Behavior [52]	O. H. Drummer	2002. Australia	Long half-life Benzodiazepines and short half-life benzodiazepines	Anxiety and sleep disorders	Avoid continuous use of Benzodiazepines in the long-term care setting; The dose should be gradually tapered off over a number of weeks; Provide the lowest dose for the shortest duration <u>Additional information</u> Adverse events occur more often at higher doses and with the use of long-acting agents. Combination with alcohol exacerbates the adverse effects.
GPs' attitudes to benzodiazepine and 'Z-drug' prescribing: a barrier to implementation of evidence and guidance on hypnotics [53]	A Niroshan Siriwardena, Zubair Qureshi, Steve Gibson, Sarah Collier, Martin Latham	2006. UK	Z-drugs (zaleplon, zolpidem and zopiclone) and benzodiazepines	Short-term management of insomnia (use of Z-drugs)	<u>Z-drugs:</u> Zaleplon duration of treatment should be with a maximum of 2 weeks; Zolpidem duration of treatment should usually vary from a few days to 2 weeks with a maximum of 4 weeks, including tapering off where appropriate; Zopiclone course of treatment should not exceed 4 weeks including any tapering off. The duration of treatment should be 2–5 days for transient insomnia

Article's title	Author(s)	Year / Country	Medicines or and/or class(es) of medicines	Guidelines related to disease(s)	Recommendations to be used in Guidelines
					and 2–3 weeks for short-term insomnia. Benzodiazepines: The use of the lowest dose; Not be continued beyond 4 weeks Additional Information: It is recommended that, because of the lack of compelling evidence to distinguish between zaleplon, zolpidem, zopiclone or the shorter-acting benzodiazepine hypnotics, the drug with the lowest purchase cost should be prescribed.
Antidepressants and Driving Ability: Results from a Clinical Study [54]	Alexander Brunnauer, Gerd Laux, Elisabeth Geiger, Michael Soyka, Hans-Jürgen Möller	2006. Germany	Antidepressants such as selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants (TCAs), serotonin-norepinephrine reuptake inhibitor (SNRI) and noradrenergic and specific serotonergic antidepressant (NaSSA)	Treatment of patients with Alzheimer's disease and other dementias	Low starting doses, small dose increases, and long intervals between dose increases; Venlafaxine can be started at a dosage as low as 25 mg/day and increased up to a maximum dosage of 375 mg/day; Mirtazapine can be started at a dosage as low as 7.5mg at bedtime and increased up to a maximum dosage of 45–60 mg at bedtime; Citalopram is started at 5–10 mg/day and increased up to a maximum of 40 mg/day

Article's title	Author(s)	Year / Country	Medicines or and/or class(es) of medicines	Guidelines related to disease(s)	Recommendations to be used in Guidelines
					Additional Information: If venlafaxine is prescribed, careful monitoring of blood pressure is indicated. Less sedation is found with Mirtazapine in dosages over 15 mg/day.
Ethical and Legal Dimensions of Benzodiazepine Prescription [55]	Harold J. Bursztajn, Archie Brodsky	1997. US	Benzodiazepines	Management of chronic non-cancer pain	Physicians must balance medical need with the possibility of abuse and diversion, as well as the necessity to comply with state and federal regulations; <u>Additional information:</u> Education is a critical component of any program to control the diversion of prescription drugs; Pill counts are essential in patients suspected of abuse and would greatly reduce controlled substance abuse and diversion.
Opioid medication and driving ability [56]	Hans G. Kress, Birgit Kraft	2004. Austria	Opioids	Opioid guidelines in the management of chronic non-cancer pain	Start at lower doses to maintain functional status; Manage side effects; <u>Additional information:</u> Principles for prescribing opioids must require a specific evaluation of the impact on functional status, identification and treatment of undesirable side effects, and monitoring for abuse behaviours.

Based on what was stated, and having the guidelines from the American Medical Association (AMA) [58] and from the Canadian Medical Association (CMA) [59] as main reference, information regarding classes of medicines that are known to affect driving ability, as well as advice that should be given to patient taking those medicines is summarised as follows (only for antidepressants specification per active substance was done):

Anticholinergics

Anticholinergic effects that can impair driving performance include blurred vision, sedation, confusion, ataxia, tremulousness, myoclonic jerking and delirium (acute onset of cognitive deficits often associated with hallucinations and fluctuating levels of consciousness), especially in older people. Patients should be counselled about these symptoms and should alert their physicians immediately if they occur. Patients should also be advised that psychomotor and cognitive impairment might be present even in the absence of subjective symptoms (this has been well documented for antihistamines).

Subtle deficits in attention, memory, and reasoning may occur with therapeutic dosages of anticholinergic drugs without signs of frank toxicity. These deficits have often been mistaken for symptoms of early dementia in elderly patients.

Anticonvulsants

The patient should temporarily cease driving during the time of medication initiation, withdrawal, or dosage change due to the risk of recurrent seizure and/or potential medication side effects that may impair driving performance. Some of the medicines used to control epileptic seizures can cause drowsiness in some patients, particularly when first prescribed or when dose is increased. Patients should be closely observed and warned not to drive while this side effect persists. Patients should be advised not to drive for 24 hours following conscious sedation.

If there is significant risk of recurrent seizure during medication withdrawal or change, the patient should cease driving during this time and for at least three months thereafter.

Note that many anticonvulsants (e.g., valproic acid, carbamazepine, gabapentin, lamotrigine and topiramate) are also being used as analgesics, mood stabilisers for treatment of bipolar disorder, for agitation in dementia, for neuropathic pain and as sedating agents for anxiety. These agents are typically an adjunct to antidepressants, antipsychotics and/or anxiolytics. By themselves, anticonvulsants may be mildly impairing, but the combined medication effects on psychomotor performance tend to enhance their effects. When prescribing anticonvulsants and other psychoactive drugs, it is wise to start with low doses of each and gradually increase the dosage of each one separately to minimise significant side effects. In addition, this would allow for a clear identification of which drug may be producing a benefit or problem.

Antidepressants

Impairing side effects vary among the different classes of antidepressants, and even within certain classes of antidepressants. The older tricyclic antidepressants can have pronounced anticholinergic and antihistaminic effects, which may impair driving. The more modern antidepressants may have fewer adverse effects. These considerations need to be taken into account when planning the treatment of a patient who is a professional driver. Recent data have also implicated venlafaxine as being associated with motor vehicle crashes. Whenever possible, physicians should initiate antidepressant therapy with the least impairing medication possible. However, the data indicating increased crash risk with the specific use of certain medications may reveal associations but not necessarily causation. It is difficult to know whether increased risk is associated with the drug, a drug-drug interaction, or the disease itself (e.g., depression, which may independently impair attention, judgment, etc).

Patients should be advised not to drive during the initial phase of antidepressant. Dosage adjustment(s) are needed if the patient experiences drowsiness, light-headedness, or other side effects that may impair driving performance. Patients should also be advised that they might experience impairment in the absence of any subjective symptoms.

Bupropion

Side effects of bupropion include anxiety, restlessness, weight loss, and insomnia (leading to daytime drowsiness). Patients should be counselled about these side effects and their potential to impair driving performance. Because bupropion may cause seizures at high doses, it should not be prescribed to patients with epilepsy, brain injuries, eating disorders, or other factors predisposing to seizure activity.

Mirtazapine

Mirtazapine is typically taken only at night due to its sedating effects. It has been shown to cause substantial impairment for many hours after dosing. If daytime sedation is noted as an adverse side effect, another antidepressant should be considered or driving discontinued.

Monoamine oxidase (MAO) inhibitors

Side effects of MAO inhibitors that may impair driving performance include blurred vision, overstimulation, insomnia (leading to daytime drowsiness), orthostatic hypotension (with transient cognitive deficits), and hypertensive crisis (presenting with severe headaches and/or mental status changes). The latter can be caused by failure to adhere to dietary and medication restrictions. Patients should be counselled about these side effects and their potential to impair driving performance.

Selective serotonin reuptake inhibitors (SSRIs)

Common side effects of SSRIs that may impair driving performance include sleep changes (insomnia or sedation), headache, anxiety, and restlessness. While these side effects tend to be mild and well tolerated, physicians should counsel patients to be alert to their potential to affect driving performance. Special mention is made of serotonin syndrome, wherein mental status changes, autonomic hyperactivity, and neuromuscular side effects are observed due to excessive amounts of the drug or a drug-drug interaction. Treatment includes discontinuing the offending agent or hospitalization in severe cases.

Tricyclic antidepressants (TCAs)

Common side effects of TCAs that may impair driving performance include sedation, blurred vision, orthostatic hypotension, tremor, excitement, and heart palpitations. In studies involving healthy volunteers, the more sedating TCAs have been shown to impair psychomotor function, motor coordination, and open-road driving. Other studies appear to indicate an increased crash risk for drivers who take TCAs.

Whenever possible, other agents like SSRIs or TCA's with a low propensity for anticholinergic effects (nortryptiline or desipramine) should be considered for those who wish to continue driving. If nonimpairing alternatives are not available, then the physician should advise patients of the potential side effects, and recommend temporary driving cessation during the initial phase of medication initiation/dosage adjustment. Patients should also be advised that they might experience impairment even in the absence of subjective symptoms.

Serotonin–norepinephrine reuptake inhibitors (SNRIs)

Serotonin–norepinephrine reuptake inhibitors (SNRIs) are a class of antidepressant drugs used in the treatment of major depression and other mood disorders. This class of antidepressants can also be used to treat anxiety disorders, obsessive-compulsive disorder (OCD), attention deficit hyperactivity disorder (ADHD), chronic neuropathic pain, and fibromyalgia syndrome (FMS).

The most frequently prescribed SNRIs are venlafaxine and duloxetine. The most commonly observed side effects associated with the use of venlafaxine or duloxetine are somnolence, dizziness, nausea, insomnia, nervousness, and asthenia.

Despite the side effects that can be present specially at the beginning of the treatment, venlafaxine has been shown not to affect psychomotor, cognitive, or complex behaviour performance in healthy volunteers. Patients should, in any case, be aware for the possible presence of side effects.

Duloxetine, on the other hand, has more sedative properties than venlafaxine. For that reason, health care providers should advise their patients not to drive during first weeks of treatment once duloxetine may be associated with sedation and dizziness.

Antiemetics

Numerous classes of drugs—including anticholinergics, antihistamines, antipsychotics, cannabinoids, benzodiazepines, 5HT antagonists, and glucocorticoids—are used for their antiemetic effect. These drugs are known to have side effects that may impair driving performance, such as sedation, blurred vision, headache, confusion, and dystonias. It is important to mention that side effects can vary as they depend on the medicine. For example, side effects that can be attributable to cannabinoids are totally different from those to be expected while taking glucocorticoids or 5HT antagonists. Significant impairment may be present even in the absence of subjective symptoms; this has been well documented for many benzodiazepines and over-the-counter antihistamines. Patients should be counselled about side effects and their potential to impair driving performance, and should be advised that they may experience impairment even in the absence of subjective symptoms.

Antihistamines

In many patients, the first generation antihistamines (such as diphenhydramine and chlorpheniramine) have pronounced CNS effects. In studies involving healthy volunteers, sedating antihistamines have been shown to impair psychomotor performance, simulated driving, and open-road driving. These studies do give important information but it should be kept in mind that those medicines are being prescribed to reduce the burden of a symptom which might, by itself, impair driving ability. Furthermore, subjects may experience impairment even in the absence of subjective symptoms. In contrast, most non-sedating antihistamines do not produce these types of impairment after being taken in recommended doses. Even non-sedating antihistamines may cause impairments if taken in higher-than-recommended doses, however, and one of them (i.e., cetirizine) may be slightly impairing to certain patients in normal doses.

Patients who take sedating antihistamines (highly impairing) should be advised not to drive while on the medication(s). If these patients wish to continue driving, they should be prescribed a non-sedating (less impairing) antihistamine.

Antihypertensives

With their hypotensive properties, common side effects of antihypertensives that may impair driving performance include lightheadedness, dizziness, and fatigue. In addition, antihypertensives with a prominent CNS effect, including beta-blockers and the sympatholytic drugs clonidine, guanfacine and methyldopa, may cause sedation, confusion, insomnia, and nervousness.

Patients should be counselled about these side effects and their potential to impair driving performance. In addition, patients taking antihypertensives that may potentially cause electrolyte imbalance (i.e., diuretics) should be counselled about the symptoms of electrolyte imbalance and their potential to impair driving performance.

Antiparkinsonians

Several medications and classes of medications, including levodopa, antimuscarinics (anticholinergics), amantadine, and dopamine agonists, may be used in the treatment of Parkinson's disease symptoms. Common side effects of antiparkinsonian drugs that may impair driving performance include excessive daytime sleepiness, lightheadedness, dizziness, blurred vision, dyskinesias, on-off phenomenon, hallucinations, and confusion.

Patients should be counselled about these side effects and advised not to drive if they experience side effects. The physician may also consider referring patients for formal psychomotor testing or for on-road assessment performed by a driver rehabilitation specialist.

Antipsychotics

Most, if not all, antipsychotic medications have a strong potential to impair driving performance through various CNS effects. Some of the original or "classic" antipsychotics are heavily sedating, and all produce extrapyramidal side effects (EPS). Although the modern or "atypical" drugs have a lower tendency to cause EPS, they, too, are sedating.

Patients should be counselled about these side effects and advised not to drive if they experience side effects severe enough to impair driving performance. The

physician should consider referring the patient for formal psychomotor testing or for on-road assessment performed by a driver rehabilitation specialist. If medication therapy is initiated while the patient is hospitalised, the impact of side effects on driving performance should be discussed prior to discharge.

Benzodiazepines and other sedatives /anxiolytics

Benzodiazepines are the most likely psychotropic medication to impair driving performance, particularly the long acting compounds. Alcohol will potentiate the effects. Despite the adverse effects attributable to these medicines, it is important to mention that drivers with psychiatric illnesses are often safer when well and on regular psychotropic medication than when they are ill. Inadequate treatment or irregular compliance may render a driver impaired by both the illness and medication.

Studies have demonstrated impairments in vision, attention, motor coordination, and driving performance with benzodiazepine use. Evening doses of long-acting benzodiazepines have been shown to markedly impair psychomotor function the following day, while comparable doses of short-acting compounds produce a lesser impairment. In contrast, benzodiazepine-like hypnotics (such as zolpidem and zaleplon) have a more rapid rate of elimination. Studies of driving performance and psychomotor function have shown that five hours after taking zaleplon and eight hours after taking zolpidem at recommended doses, it is generally safe to drive again. Recently, reports in the news media and some studies indicate that zolpidem has not uncommonly been found during serum toxicology testing of drivers involved in fatal accidents or arrested for driving under the influence of drugs.

Patients should be prescribed evening doses of the shortest-acting hypnotics whenever possible. Patients who take longer-acting compounds or daytime doses of any hypnotic should be advised of the potential for impairment, even in the absence of subjective symptoms. These patients should also be advised to avoid driving, particularly during the initial phase of dosage adjustment(s).

Muscle relaxants

Most skeletal muscle relaxants (e.g., carisoprodol and cyclobenzaprine) have significant CNS effects. Patients should be counselled about these side effects, and should be advised not to drive during the initial phase of dosage adjustment(s) if they experience side effects severe enough to affect safe driving performance.

Nonsteroidal anti-inflammatory drugs (NSAIDs)

Isolated case reports of confusion following the use of the NSAIDs phenylbutazone and indomethacin suggest that they may rarely impair driving performance. Recent data reveal an association with motor vehicle crashes, although this could represent the effects of the disease and not specifically treatment. If the patient reports this side effect, the physician should consider adjusting the dosage or changing the medication.

Narcotic analgesics (e.g. opiates and opioids)

Narcotic analgesics, like opioids, are being widely used, and accepted as good medical practice to relief long-lasting pain from cancer and non-cancer patients. Previously it was taken for granted that opioids invariably would reduce cognitive and psychomotor abilities enough to make all patients on opioid medication unfit to drive a car. Psychomotor laboratory and simulator studies of patients on acute, short- and long-term opioids have documented that driving ability can be well preserved. Epidemiological studies have documented that the risk of accidents caused by driving a car while on stable long-term opioid treatment is low.

However, euphoria, depression or inability to concentrate are side-effects that can follow the use of opioids.

If a patient on long-term, stable opioid therapy is considering driving a car, the health care provider should make sure that the patient:

- should do this only if the opioid dose has been stable for at least 14 days [49-51], [61];
- should never drive if he/she feels tired, sedated, fatigued, dizzy, sleepy;

- should always report to the physician when feeling tired, sedated, or fatigued and discuss with the doctor the possibility of reducing the opioid dose;
- must never combine opioid medication with alcohol, sedative, anxiolytic, or any other psychoactive medication (or illegal drugs of any kind).

The physician, at all times, should inform the patient about the effects of opioids on driving ability and the regulations made by the authorities of their country concerning long-term and stable opioid medication and driving ability.

Stimulants

Common side effects of traditional stimulants (such as amphetamines and methylphenidate) that may impair driving performance include euphoria, overconfidence, nervousness, irritability, anxiety, insomnia, headache, and rebound effects as the stimulant wears off. Patients should be counselled about these side effects and advised not to drive during the initial phase of dosage adjustment(s) if they experience side effects severe enough to impair driving performance. (The novel stimulant, modafinil, is not euphorogenic, nor does it appear to cause rebound effects. However, its safety for use when driving has not yet been demonstrated.)

In addition, many stimulants have a high potential for abuse. Accordingly, physicians should always be alert to signs of abuse.

2.4. Discussion and Conclusion

Uniform and standardised prescribing and dispensing guidelines for medicines affecting driving performance are hard to find in the medical and pharmaceutical literature. Health care providers admit there is a need to use guidelines for safe prescribing and dispensing of medicinal drugs to patients. It is a well known and established fact that not only medicines can affect the ability to drive; certain diseases can be even more impairing than medicines. The first step to decrease deaths on the roads attributable to medicines is by providing GPs and pharmacists with accurate and clear guidelines with advice and information on medicines that are prone to affect driving. AMA, CMA and DVLA are examples of associations that have written guidelines to assist health care professionals, not only with information about medicines that affect driving ability but also with relevant information on how specific diseases such as dementia (including Parkinson and Alzheimer's diseases), epilepsy, cardiovascular diseases or diabetes affect driving ability; how to assess fitness to drive in patients impaired either by medicines or by diseases is also part of such guidelines. Within DRUID (Task 4.3), and in order to produce the categorisation and labelling of the various medicines with a negative influence on driving, fact-sheets were developed. These fact-sheets include all relevant information about the side effects and characteristics of individual medicines as well as advice to the patient. All information were included in the decision support tool that was created by DRUID partners (see Chapter 6). DRUID fact-sheets can clearly be seen as guidelines and are an important decision support for health care professionals.

Prescribing and dispensing guidelines must ensure that patients will obtain maximum benefit from their doctor or pharmacist's knowledge. Whenever a patient is prescribed a driving impairing medicine, GPs and/or pharmacists have to communicate to their patients that there is an increased risk of being involved in a traffic accident as the patient is driving under the influence of driving impairing

medicines. Healthcare providers need to make sure that the patient is able to recognise and detect any side effects on his/her psychomotor performance and that the patient received all information needed to decide whether he/she should drive (or not). It is very important that health care providers keep a medical record with the information that was provided to a patient due to possible litigation in case a patient decides to drive against medical advice and he/she is involved in a car accident.

3. Recent information on the development of prescribing and dispensing guidelines on medicines and driving.

3.1 Input from D-7.2.1 and D-7.4.1

D-7.2.1 [62]

"Recommendations for improving medical guidelines for assessing fitness to drive in patients who use psychotropic medicines"

The relevant input from D-7.2.1 that can be used in the development of the current DRUID deliverable, are the main conclusions of the questionnaire survey that was addressed to the driving licensing authorities, in particular the first part of this questionnaire, dealing with the dispensing of psychotropic medicines.

In D-7.2.1 can also be read that medical guidelines/procedures on prescribing or dispensing medicines are "not always binding in the respective countries and show considerable differences in attributes and specifications". Unfortunately, these guidelines are "the exception and not the rule" and they are typically "recommendations, not regulations". The role, responsibilities and tasks of physicians and pharmacists are "not defined uniformly" and, "in most cases, physicians and pharmacists will not be made legally responsible" when one of their patients [taking a driving impairing medicine(s)] is made responsible for a traffic accident.

Eight recommendations were made in order to improve guidelines and procedures for assessing fitness to drive, in particular on the text of Article 15 of the Council Directive 91-439-EEC. In summary, some of the recommendations "point at the

vague terms that are used in Article 15 (such as *substance abuse*, *regular use*, both for medicines and illicit drugs, etc.), whereas more internationally accepted terms exist". It is also recommended "to include the underlying cause or reason for taking medicines, as well as all comorbidity factors, while assessing fitness to drive. Another recommendation points at the term *combinations of medicines with central nervous system activity*. (…) This is especially of interest for drivers with co-morbidities and in case of polypharmacy. It is also recommended to apply the DRUID categorisation system for medicines affecting driving performance in developing national requirements for fitness to drive. Finally it is recommended that in situations where physicians will advise a patient to start driving again after a period in which the advice was given not to drive while using the medicine, specific procedures are needed to structure the consultation and to manage the risk of litigation in case an accident could occur".

D-7.4.1 [63]
"Training Manual for Physicians and Pharmacists on Medicinal drugs and Driving"

D-7.4.1 focuses on the implementation of practice guidelines and protocols for prescribing and dispensing medicines affecting driving performance. As a result, several references to prescribing and dispensing guidelines are made, including the ones developed within DRUID, where it is stated, among other recommendations, that "health professionals are advised to provide patients with clear information allowing them to make their own judgements and to decide whether it is safe for them to drive." Reference to the DRUID categorisation system and fact-sheets that were produced (WP4, task 4.3) are also mentioned.

D-7.4.1 encompasses all the necessary (content) information that was needed to organise the training sessions for physicians and pharmacists. The same is to say that D-7.4.1 contains a stepwise approach for prescribing safe medicinal

treatments to drivers, general advice for applying the categories and warning levels, and general considerations on how to assess fitness to drive. A description of decision-support tools for pharmacists' and physicians' daily practice to be used in Belgium (physicians and pharmacists), the Netherlands (pharmacists) and Spain (pharmacists) is also part of D-7.4.1.

3.2 Input from the National Organizations of Physicians and Pharmacists

3.2.1 Introduction

One of the DRUID goals is the development of guidelines and information materials for health care providers, patients and users of psychoactive substances (Task 7.2 “guidelines and professional standards”). After reviewing the state-of-the-art of existing campaigns in EU countries (D-7.1.1 [64]) and after inquiring national driving licensing authorities about prescribing and dispensing psychotropic medicines (D-7.2.1 [62]), it was felt important to have a clear perception about the current situation in the different national associations of physicians and pharmacists regarding the existence and development of any type of prescribing or dispensing guidelines regarding medication with impairing effects on driving performance. For this reason, a questionnaire survey was developed and sent out to European professional organizations of Physicians and Pharmacists, in February 2009.

3.2.2. Methods

National associations of physicians and pharmacists were approached through European associations of physicians and pharmacists from which they are members of. The Standing Committee of European Doctors (CPME) represents the National Medical Associations of 27 countries in Europe and works closely with the National Medical Associations of countries that have applied for EU membership as well as specialised European medical associations. The Pharmaceutical Group of the European Union (PGEU) is the European association

representing community pharmacists. PGEU's members are the national associations and professional bodies of community pharmacists in 30 European countries including EU Member States, EU candidate countries and EFTA members. Twenty-five countries are ordinary members whereas 5 are observers.

Two similar questionnaires addressed to physicians and pharmacists were sent to CPME and PGEU, respectively, and thereafter forwarded to all members by e-mail. Both questionnaires had a total of 9 questions. Whenever there were no guidelines developed or being considered to be developed by the national organization, there was no need to fully complete the questionnaire (see Annex 1 and 2). Once the questionnaire was filled in by the national association, it was e-mailed directly to RUGPha, where it was analysed. No reminders were sent.

3.2.3 Results

1. *National Associations of Physicians*

National associations of physicians from Austria, Belgium, Czech Republic, Hungary, Iceland, the Netherlands, Romania, Sweden and United Kingdom sent back the questionnaire to RUGPha (9 out of 27 countries; 33.3% response rate).

In all 9 countries, no organization developed guidelines concerning drugs and driving or ever considered developing such guidelines. In **Austria** it was made reference to the existence of warning messages (symbols and text) in the label of medicines that might impair driving. In **Iceland** medicines are marked with a warning, when they are known to impair driving ability; however, the development of guidelines is handled by the Icelandic Medicines Control Agency. For the remaining participating countries, the organizations that responded to the questionnaire are not the ones responsible for the development of guidelines. The explanation given for not considering the

development of guidelines is as follows: **Belgium** - “Our organization is not a scientific organization and it is not really our role.”; **Czech Republic -** “no demand.”; **Romania** – “the design of this kind of guidelines is not a part of our area of interest.”, **Sweden -** “the Swedish Medical Association (SMA) is a union for the Swedish doctors. Issues we deal with include salaries, working hours, training and research.”; **United Kingdom** - “this is not something Health Policy & Economic Research Unit (HPERU) or the British Medical Association (BMA) are in position to contribute to, as we do not produce the prescribing guidelines of the nature being researched.”. **Hungary** and the **Netherlands** didn’t provide any explanation for the fact that they never considered the development of prescribing guidelines.

No questionnaire was received from **Spain**. However, national guidelines are available (information provided by the Spanish DRUID partner on this work package). One manual [65] addressed to general practitioners working in the public health system has a specific chapter on medicines and driving and another in analyse fitness to drive and medicines’ use. Guidelines on medicines that are safe for drivers are available as well. Recommendations about the decision making process are also mentioned.
Guidelines addressed to specialists [66] [67] are also available in Spain. The document includes the categorization system for medicines and driving as well as guidelines for safe prescription to those who need to drive. Regulations on fitness to drive and recommendations about the decision making process are also included.

2. National Associations of Pharmacists

A total of 17 out of 30 national associations of pharmacists replied to the request of PGEU, filled in the questionnaire and sent it back to RUGPha (56.7% response rate). Austria, Belgium, Croatia, Finland, France, Germany, Greece, Republic of Ireland, Italy, Latvia, Republic of Macedonia, the Netherlands, Norway, Portugal, Slovenia, Spain, United Kingdom were the participating

countries. From United Kingdom, 2 questionnaires were received: one from the Royal Pharmaceutical Society of Great Britain and another one from the Pharmaceutical Society of Northern Ireland. These two questionnaires were considered separately.

Only 4 out of 30 national associations of pharmacists (13.3%) stated having developed dispensing guidelines concerning drugs and driving. Table 3 summarises the situation in all participating countries regarding the existence of dispensing guidelines related with drugs and driving which were developed by the respective national organization. In **the Netherlands**, the guidelines are incorporated in the CPOE's and in the pharmacies' computerised dispensing systems. Furthermore, the guidelines are also published on a website (only available for pharmacists) and in a book, which is sent to general practitioners, psychiatrists, and physicians working for insurance companies. Health care providers and patients have free access to a short version of the advice on the different websites – www.geneesmiddeleninhetverkeer.nl and www.rijveiligmetmedicijnen.nl, respectively. Not only these guidelines but also other information materials targeted to patients, such as leaflets and posters, were developed in the framework of a public campaign promoted by the Dutch Ministry of Transport. In **Slovenia**, on the other hand, the guidelines were approved by the national body for pharmacy practice, which is nominated by the Ministry of Health. The Executive Committee of Slovenian Chamber of Pharmacy accepted the guidelines and recommendations that started to be introduced in everyday pharmacy practice.

Table 3 – Existence of dispensing guidelines related with drugs and driving in each participating country.

	Dispensing guidelines developed by the national association of pharmacies from…	Development of dispensing guidelines being considered by the national association of pharmacies from…
Austria		
Belgium	✓	✓
Croatia		
Finland		
France		
Germany	✓	✓
Greece		
Republic of Ireland		
Italy		✓
Latvia		
Republic of Macedonia		
The Netherlands	✓	✓
Norway		
Portugal		
Slovenia	✓	✓
Spain		✓
United Kingdom		
(Northern Ireland)		✓

Besides the 4 countries where there are guidelines regarding drugs and driving, national organizations of pharmacists from Italy, Spain and Northern Ireland are considering the development of guidelines on that same topic (Table 3). In **Germany**, the national association of pharmacists pretends to develop leaflets or brochures to be distributed in German pharmacies. In **Italy**, the national association is very interested in developing any form of compulsory indications on the pharmaceutical packages to warn the patients about the risk in driving, after the intake of psychoactive medicines. The Italian association of pharmacists is even considering asking Italian government to change the legislation, in order to include such a provision. In case of positive acceptance from the government, it will be easier to establish a set of guidelines. The **Spanish** association of pharmacists mentioned a project that aims to identify all medicines that affect the ability to drive safely. A label with a warning symbol with a reference to the patient information leaflet will be placed on the package of medicines with driving impairing effects (Figure 1). This information will be also available in the Spanish database of medicines, which is responsibility of the General Council of Official Pharmacists Associations (*Consejo General de Colegios Farmacéuticos*).

Figure 1 - Warning symbol that is labelled in the box of medicines that impair driving ability in Spain.

In **France**, despite referring for the absence of any sort of dispensing guidelines regarding drugs and driving (Table 3), it was mentioned that a working group on "medicinal products and automobile driving" was established by the French Health Products Safety Agency (Agence française de sécurité sanitaire des

produits de santé, Afssaps) to develop a grading system with 3 levels of risk, according to the level of impairment of a specific medicine. The pictogram has a specific colour (yellow, orange and red), a written indication of the risk level (1, 2 or 3), a written warning followed by an informative message on how to act when using the medicine. The three components are systematically combined and shown on the box of the medicine involved, as it is shown on Figure 2. After reviewing the driving impairing effects of 3000 medicines, within 9 therapeutic classes (digestive tract and metabolism, cardiovascular system, genitourinary system, anti-infectives for systemic use, antineoplastic and immunomodulating agents, musculoskeletal system, nervous system, respiratory system and ophthalmology), a category (1, 2 or 3), depending on the strength of the driving impairing effects, was attributed to each medicine.

Figure 2 – Warning symbols recently introduced in France. A medicine can be attributed one of the 3 pictograms, according to the level of impairment.

The reasons for not considering the development of dispensing guidelines regarding drugs and driving were mentioned by some of the participating organizations. In **Austria**, for instance, it was mentioned that medicines which affect the ability to drive or to operate machinery have to contain a remark saying "Attention: this medicine might influence the ability to drive or operate machines. It influences the ability to respond". Furthermore there are pictograms integrated in the pharmaceutical index that warns the pharmacists when dispensing those impairing medicines. In **Finland**, dispensing of all medication follows common good dispensing practice, with comprehensive patient counselling. A database containing all medicines with important information regarding dosages, interactions and warnings was integrated in a computerised system that pharmacists use in their daily practice. In 2008, a patient brochure on "Drugs and

Driving" was updated. The brochure informs patients about which medicines are likely to affect driving. In the **United Kingdom**, the British National Formulary outlines recommended cautionary and advisory labels for dispensed medicines. The following wording would be stated on effected medication: "*Warning. May cause drowsiness. If affected, do not drive or operate machinery. Avoid alcoholic drink*." Pharmacists are also expected to counsel patients, when necessary. In **Portugal**, there are no formal guidelines issued by the Portuguese Pharmacists Association (*Ordem dos Farmacêuticos, OF*). However, the National Association of Pharmacies (*Associação Nacional de Farmácias, ANF*) has been active by developing technical information addressed to Portuguese community pharmacists, in order to promote the correct counselling to patients, when dispensing medicines which may impair driving performance. Leaflets and brochures to the general public were developed by ANF and are available at any pharmacy. The **Croatian** Professional Pharmaceutical Association recognised the problem of drugs and driving; in 2008, the main theme of the "Croatian day of pharmacies" was the "Influence of the medicines on driving abilities". On that day, patients could obtain more information on the influence of medicines on driving abilities in all pharmacies. Pharmacists started advising patients about the influence of medicines on driving ability and patient information brochures were given to patients. Either in the **Republic of Ireland** or in the **Republic of Macedonia**, the national organizations that responded to the questionnaire are not the official body responsible for the development of dispensing guidelines. In case of Republic of Ireland, the official dispensing guidelines are produced by the Irish regulatory body, the Pharmaceutical Society of Ireland.

In countries where guidelines are available, guidelines have community pharmacists as main target group. Only in France and in the Netherlands the guidelines are also meant to hospital pharmacists, as well as other health care providers, such as physicians, and patients (Table 4). Dispensing guidelines are accessible to other people than pharmacists in France, the Netherlands and Spain. In Belgium, Germany and Slovenia, dispensing guidelines are restricted to pharmacists.

Table 4 – Main target group of dispensing guidelines in the countries where guidelines are available.

	Main target group			
	Community pharmacists	Hospital pharmacists	Other health care providers	Patients
Belgium	✓			
France	✓	✓	✓	✓
Germany	✓			
Italy	✓			
The Netherlands	✓	✓	✓	✓
Slovenia	✓			
Spain	✓			✓

For some of the countries, the dispensing guidelines were produced in collaboration with organizations of physicians or patients in order to develop joint statements referring to how to prescribe and dispense medicines that might impair driving (Table 5). In the Netherlands, the Dutch College of General Practitioners (Nederlands *Huisartsen Genootschap, NHG*) in combination with the Royal Dutch Pharmaceutical Society (*Koninklijke Nederlandse Maatschappij ter bevordering der Pharmacie, KNMP*) developed a national primary-care agreement between physicians and pharmacists concerning medicinal drugs and driving (the so called *LESA – Geneesmiddelen en verkeersveiligheid* [2]). In **Spain** there is a working group on drugs and driving that is coordinated by the Ministry of Health and the Commission of Scientific Societies for the prevention of injuries caused by traffic accidents. In **Slovenia**, dispensing guidelines were developed in a joint venture of 2 professional organizations: the Slovene

[2] The LESA document can be found on the website: www.geneesmiddeleninhetverkeer.nl (only available in Dutch language).

Chamber of Pharmacy (*Lekarniška Zbornica Slovenije*) and the Slovenian Pharmaceutical Society (*Slovensko Farmacevtsko Fruštvo, SFD*).

Table 5 – Dispensing guidelines containing joint statements, produced in collaboration with organizations of physicians, patients organizations or any other organizations.

	Collaboration with organization of physicians	Collaboration with patient organizations or any other organizations
Belgium	✓	
France		
Germany		
Italy		
The Netherlands	✓	
Slovenia		✓
Spain	✓	✓

The impact of the above mentioned dispensing guidelines was hardly evaluated in the countries where they are present. In the **Netherlands**, the Dutch Institute for Rational Use of Medicine (Instituut voor Verantwoord Medicijngebruik, DGV) and the KNMP gathered pharmacists' questions and doubts about the guidelines. Both organizations tried to find answers, if possible, in order to improve the use of the guidelines and, as a consequence, provide patients with the best information available. In **Slovenia**, intention to evaluate the guidelines in the near future was stated.

In **France** the impact of the guidelines was not evaluated but instead the recently introduced 3-level warning symbols (see Figure 2), both at pharmacists and patients' level. By means of a questionnaire, addressed to pharmacists and patients, it was possible to evaluate their perception of the level of risk attributed

to each warning symbol. The survey was conducted among 105 pharmacists and 400 patients. The main results of the survey can be summarised as follows:

- *Pharmacists' level*
    - For 75% of the pharmacists, spontaneous requests for information from patients about the effects of medicines on driving were rare;
    - Ninety percent of the pharmacists stated they warned patients about the side effects of the medicines on driving, while dispensing a medicine with a warning symbol;
    - Nearly 50% of pharmacists felt they do not have sufficient information to advise patients on this subject;
    - Eighty-five percent of the pharmacists believed that the new pictograms will help raising the issue about drugs and driving in a systematic and continuous way.

- *Patients' level*
    - Ninety percent of the respondents were drivers and 2/3 took, at least, one medication per day;
    - Almost 70% of the respondents felt being well informed about the potential (negative) influence of medicines on driving ability;
    - Regarding the warning symbols, 12% of the respondents stated not being aware of the warning symbol;
    - Due to the warning symbol, 7% of the respondents said they wouldn't take the medicine if they needed to drive a motorised vehicle;
    - The new warning symbols were, in general, welcomed by patients and, in 60% of the cases, patients showed their willingness to change their attitude.

Future initiatives regarding the influence of medicines on driving ability are being considered in all countries where dispensing guidelines already exist (Belgium, France, Germany, Italy, the Netherlands, Slovenia and Spain). New activities,

such as the development of new information materials (leaflets, brochures or posters) and public campaigns are planned and aimed at pharmacists, patients and general public.

3.2.4. Discussion

The main outcome of this survey among professional organizations is that prescribing or dispensing guidelines related medicines that might influence driving ability are the exception and not the rule among European countries (the same result was found in another study conducted by DRUID Task 7.2 and that was published in D7.2.1 [62]

It's clear that the national organizations of physicians are not the organizations responsible for the development of prescribing guidelines related with drugs and driving; the same is not valid for the national organizations of pharmacists. The latter seem to be very much involved in the creation of dispensing guidelines as well was in the production of leaflets, brochures and campaigns addressed to community pharmacists, to patients and to general public. The information materials are, normally, available in the pharmacy.

Belgium, Germany, the Netherlands and Slovenia are the countries where dispensing guidelines were developed by the national associations of pharmacists. In the Netherlands the guidelines are integrated in the computer system of the pharmacists. Other countries don't consider the development of such guidelines a priority, as the system in their pharmacies already includes warning signals that alert pharmacists for the possible influence of a medicine on patients' ability to drive. Moreover, the same system displays information that should be shared with patients by the time of dispense of such medicines (situation in Austria and Finland).

In France, no guidelines were mentioned. However, Afssaps evaluated the level of impairment of almost 3000 medicines. A category (1, 2 or 3) was attributed to the medicine according to the degree of impairment. Each category is assigned one warning symbol that is labelled in the medicine's package. The implementation of the 3-level of impairment symbols was evaluated; the acceptation of the French symbols was very favourable, both from pharmacists and patients' point of view. In Spain, the development of a warning symbol to be printed in the package of medicines with driving impairing properties has been officially accepted.

Even if symbols aren't a guideline, they seem to be a valid way of communicating the risk associated to medicines when it comes to driving. Symbols and warning signs, when integrated in pharmacies' computer software systems, are an effective way of giving the first alert which allows pharmacists to provide patients with information regarding the influence of their medicines on their ability to drive. When a categorisation system is available, like the one that exists in France and the one that DRUID is currently developing, it will be possible for the pharmacists to suggest a safer alternative to the patient. Having it pre-established in physicians and pharmacists' joint statements would constitute a great achievement on patients' ability to drive safely.

Whenever dispensing guidelines are available, community pharmacists are the main target group. In Belgium, the Netherlands, Slovenia and Spain guidelines were prepared in collaboration with physicians and/or patient organizations. As a consequence, joint statements could be presented. The Netherlands is an example of a country where physicians and pharmacists often actively cooperate and produce combined statements. As a result of the joint effort a national document on how to consult patients with relevant background information (the so called "LESA agreement") was produced.

Future initiatives are being planned in several European countries. This means that the problem of drugs and driving is still being recognised and that more efforts

are needed to raise patients' and health care providers' awareness regarding the risks of driving under the influence of medicines.

2.3.5. Conclusion

Prescribing and dispensing guidelines are not frequently available in European countries. However, to fill this gap, several national organizations of pharmacists developed their own warning signs, messages and symbols that are integrated in pharmacists' computer software systems that ultimately can be printed on the medicines' package. These seem to be an effective way of alerting pharmacists for the potential (negative) effect of certain medicines on the ability to drive.

The current situation in Europe is a window of opportunities for DRUID, in terms of creating prescribing and dispensing guidelines that can uniformly be accepted and used in all EU countries.

4. Input for developing information for patients who use other psychoactive substances than medicines

The use of illicit drugs in the EU increased since the late 1990s. Not surprisingly, the prevalence of driving under the influence of illicit drugs increased greatly. About 1% to 2% of drivers stopped during roadside surveys were tested positive for drugs in saliva [68]. In motor vehicle accidents, 5-25% of the drivers tested positive for drugs [69].

Most illicit drugs can have an impairing effect on driving performance. Cannabis is the most prevalent illicit drug normally detected in drivers [70]. A prevalence of 2-32% for cannabis, 2-6% for amphetamines and 4-11% for cocaine has been found. [69].

From a literature search performed by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), in 1999 [71] the following conclusions can be drawn concerning illicit drugs:

Methadone

- ✓ Experimental studies have suggested that, in some individuals, the effect of acute methadone administration is to produce a dose-dependent reduction in reaction time, in visual function and in information processing. Significant psychomotor impairments are seldom evident when non-naive subjects have been tested.
- ✓ Where new patients on a maintenance programme are concerned, the literature suggests that it is advisable to allow a period of up to a month during which they should not drive.

- ✓ Field studies have shown that, where body fluids have been examined for drug traces, narcotic analgesics [including methadone] have not featured prominently.
- ✓ In general the effects of the opioids are slight when compared to other drugs such as benzodiazepines.
- ✓ As is the case with numerous drugs, methadone can potentiate the deleterious effects of alcohol.
- ✓ Both experimental and field studies suggest that methadone use does not result in sufficient driving impairment to merit users being designated as "unfit"; experimental studies would suggest that this is particularly the case with nonnaïve or experienced users.

Cannabis

- ✓ Where experimental studies are concerned, although there is some conflicting evidence, cannabis does not seem to significantly impair very basic perceptual mechanisms.
- ✓ However cannabis does impair more subtle aspects of perceptual performance such as attention and short-term memory, although these are typically observed at higher doses.
- ✓ Most experimental studies have used fairly low doses of cannabis and this may not reflect the doses ingested by heavy marihuana users.
- ✓ Field studies have demonstrated that cannabis is one of the most prevalent drugs discovered in fluid samples taken from drivers. However, assessment of the causal role of cannabis in accident occurrence is complicated by the fact that alcohol is also present in the majority of samples.
- ✓ When mixed with alcohol, cannabis is much more likely to be a risk factor than when consumed alone.

Amphetamines

- ✓ Experimental studies suggest that at lower doses amphetamines have few effects on cognitive functioning, but at higher doses risk-taking increases and responses become inappropriate. Lower doses may actually result in an enhancement of some psychomotor tasks.
- ✓ Field evidence suggests that there is insufficient evidence to specifically implicate amphetamine use in traffic accidents, largely due to a lack of controlled studies.
- ✓ Only a few studies have directly examined alcohol-amphetamine interactions and the results are somewhat contradictory. In general, high doses of amphetamine are likely to increase the impairing effects of alcohol.
- ✓ In general therefore, there may be subjective positive stimulant effects associated with amphetamine use; however these same effects, especially at higher doses, could result in personality changes leading to an increased likelihood of impaired driving.

Ecstasy and Other Synthetic Drugs (GHB, Ketamine, PCP, Fentanyl, Ephedrine and Phentermine)

- ✓ It is evident from the comparatively sparse literature on MDMA and other synthetic drugs and driving that much more research is required in order to increase understanding of the impairing effects of this drug. At present, one must extrapolate from the few studies available on psychological effects to the driving act.
- ✓ In particular, most medical research has concentrated on the short-term effects of MDMA and little is known of its consequences following long-term usage.
- ✓ Ecstasy tablets are often comprised of numerous, potentially toxic constituents, the combined effects of which are largely unknown.
- ✓ Similarly, there is very little evidence concerning the specific effects of GHB, ketamine, PCP, fentanyl and abused diet drugs on driving abilities and in field studies they have not been frequently detected.

- ✓ Given the known side-effects of these drugs however and especially given the perception-altering effects of some of them, notably PCP and fentanyl, it is likely that they constitute a danger where driving is concerned.
- ✓ At present, much more experimental work needs to be carried out in order to elucidate the effects of all these drugs on mental and psychomotor performance.

Inhalants

Inhalants, such as solvents, glue, gasoline, etc., are toxic to the central nervous system. Use of these inhalants may also result in substance dependence and impairment of the ability to operate a motor vehicle during acute intoxication or due to chronic damage to the brain.

From what was stated above, it is clear that there is the need for prevention techniques to reduce driving after taking illicit drugs. Such needs can also be derived from the declared intentions of people to drive under the influence of drugs, or from their lack of knowledge about the consequences.

Physicians and pharmacists who provide care to patients who are using illicit drugs need to address the potentiation of the impairing effects on driving when prescribed psychotropic medicines are taken in combination with illicit drugs. It is recommended not to drive when these combinations are used and to structure the consultation with emphasis on managing the risk of litigation in case an accident would occur: as in all consultations good documentation procedures on the advices given to patient should be installed.

Physicians and pharmacists who are participating in substitution programs (e.g. methadone or buprenorphine) should equally be aware of the fact that a mojor part of the substituted patients are still using (combinations of) illicit drugs and alcohol.

5. Clinical decision support based on practice guidelines and protocols

Clinical decision support (CDS) in general provides healthcare providers, healthcare staff and patients with knowledge and person specific information to enhance health and to improve the quality of health care services. CDS encompasses a variety of activities, tools and interventions such as computerised alerts and reminders, diagnostic support, patient data reports, order sets, documentation templates and clinical workflow tools [72]. CDS is based on systematically developed statements to assist healthcare provider and patient decisions about appropriate health care for specific conditions, which are presented in clinical practice guidelines [73]. The development of these guidelines is aimed at reducing variation in provider practice and inappropriate care. A clinical practice guideline usually contains various sections on the intention(s) of the guideline, the evidence based scientific background, patient eligibility criteria, explicit statements such as recommendations for selecting a medicine, advice for patients and treatment cost-benefit analyses, and references [74]. For instructing health care providers and staff on how to apply the guideline a set of clear activities can be described in protocols. These protocols are manuals on using appropriate tools and procedures for achieving less time consuming processes and improving documentation of care activities. Protocols sometimes are developed to be used for just-in-time use at the point of care and may contain decision support tables or flow diagrams, and checklists.

The three pillars for fully realizing the promise of CDS are i) best knowledge available when needed, ii) high adoption and effective use, and iii) continuous improvement of knowledge and CDS methods [72]. These strategic objectives can be realised if clinical knowledge and CDS interventions are presented in a standardised format and organised in service from which users can readily find the specific materials. Furthermore, by identifying and disseminating the best practices

for CDS improvement of clinical adoption and application of CDS interventions, end-users will readily adopt and implement the CDS tools.

Clinical decision support systems (CDSS) are computer systems designed to impact clinical decision making about individual patients at the point in time that these decisions are made [75]. CDSS vary in how easy they can be accessed by health care providers. CDSS can be described as stand-alone systems or part of (non)commercial computer based patient record systems. Another distinction is based on the nature of the information provided, either being general or speciality based. Nowadays vendors of CDSS are incorporating CDSS into their computer based records and physician order entry systems (CPOE).
Research shows that four factors are the main indicators of successful implementation of CDSS [76]:

1. providing alerts/reminders automatically as part of the workflow;
2. providing the suggestions at the time and location where the decisions were being made;
3. providing actionable recommendations;
4. computerizing the entire process;

CDSS are believed to have the potential to influence the process of care, but can only do so if they are used properly. Decision support systems for prescribing medicines have been evaluated by Mollon et al [77] to know what features of prescribing CDSS predict successful implementation, change in provider behaviour, and change in patient outcomes. This systematic review of randomised controlled trials, revealed that of 41 citations that met the criteria, 37 reported successful system implementations, 25 reported success at changing health care provider behaviour, and 5 identified improvements in patient outcomes. Descriptive analysis did not confirm any feature to be more prevalent in successful implementation, provider behaviour or patient outcomes. The authors concluded that electronic prescribing decision support systems can be implemented and have the potential to change clinician behaviours, but there is no consistent translation into improved patient outcomes. They also emphasised that a lack of attention to

evidence-based optimalisation of prescription CDSS interventions will delay the development and implementation of these systems.

It is against this background of knowledge and experience that DRUID WP 7 Partners have developed proposals for improving and evaluating prescribing and dispensing decision support systems (see also Deliverable 7.4.2.). It was decided to incorporate the CDS tools, if possible, into existing prescribing and dispensing support systems that exist in Belgium, Spain and the Netherlands. Ideally computerised alerts and reminders for selecting the safest medicine for patients who drive a car, should be presented automatically as part of the workflow. It should show suggestions that indicate how to act at the time that the decision is being made, with practical advice for the patient how to use the medicine at the start of treatment and in chronic use when driving is intended. Examples of ICT supported prescribing and dispensing CDSS are presented in Chapter 6 as demonstrations of software applications being used by physicians and pharmacists in Belgium, Spain and the Netherlands. More specific information can also be retrieved from Annexes 3 and 4 and the CD that is part of this deliverable.

Furthermore, it was decided to develop an ICT tool with all relevant background information on impairing medicines (based on WP 4 outcomes, Task 4.3) readily accessible for healthcare providers. In particular the fact-sheets with summarised information on the medicine's impairing potential and advice for the patient are the essential components for developing clinical practice guidelines and to transform these into computer interpretable guidelines. A demonstration of this ICT tool specially developed for the DRUID project is presented on the CD that is part of this Deliverable; a brief description of the tool follows in Chapter 6.

6. Demo(s) based on the DRUID, Belgium Dutch and Spanish examples of software being used at pharmacists' and physicians' practices

One of the DRUID WP7 (Task 7.2) aims is the possible use of ICT tools in the computerised information systems that physicians and pharmacists use in their daily practice. To accomplish this objective, DRUID Partners developed an ICT tool, based on the fact-sheets of medicines that impair driving ability that was produced in WP4. Only the information presented in the fact-sheets was integrated in the electronic software systems already existing in Belgium (ViaNova for pharmacists and SoSoeMe for physicians), in the Netherlands (Pharmacom for pharmacists) and in Spain (UVa).

A brief explanation on the content of the tools/software systems is presented below, as well as one screen-shot example of the tool. A complete demonstration is included in the CD-rom that is part of this deliverable and it can also be found in the DRUID website (www.DRUID-project.eu)

DRUID TOOL

The DRUID ICT tool, developed by CERTH-HIT, a DRUID WP7 Partner, can be used to find information about the driving impairing effects of medicinal drugs. With an easy-access database, by typing the name or ATC code of a certain medicine the health care provider (physicians or pharmacists) can find information about the driving impairing effects of the medicine.

The tool is constructed in the following way:

- ✓ *Main Form window* – where the medicinal active substance can be selected. There are several ways of doing so.
- ✓ *Substance Information window* – where specific information regarding a medicine's categorisation and advice to the patient can be found. As regards categorisation, all medicines included on the database can be categorised into one of 3 possible categories: I when the medicine is likely to produce minor effects on fitness to drive; II when the medicine is responsible for moderate impairing effects on fitness to drive; and III when the medicine is likely to produce sever driving impairing effects.
- ✓ *DRUID Fact-Sheet window* – the tool contains the DRUID WP4 fact-sheets with extended information about a medicine.
- ✓ *Alternative Medicines window* – the tool allows physicians or pharmacists to find safer alternative medicines that, consequently, have less driving impairing effects.

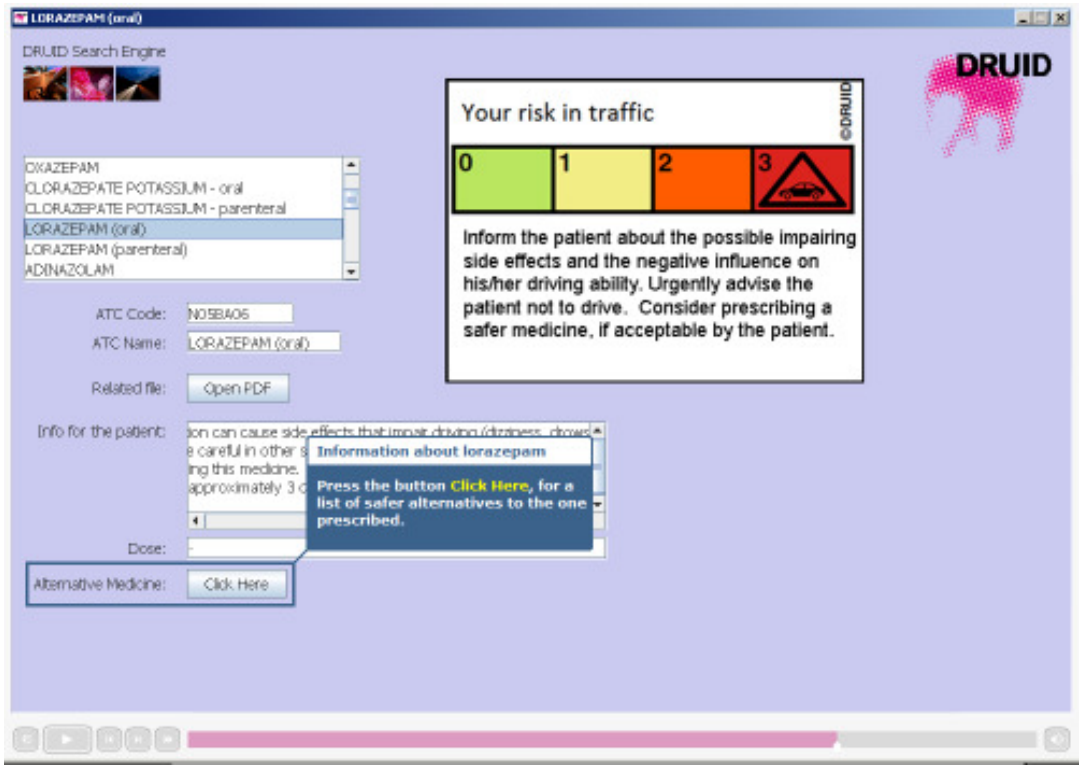

Figure 3 – example of the DRUID tool.

SoSoeMe (Belgium)

SoSoeMe is a software program for an organised electronic medical record management aiming Belgian physicians. When prescribing medicines with a potential influence on driving ability, SoSoeMe displays a warning symbol (by means of an icon).

The SoSoeMe information system offers support in the following ways:

- ✓ Written information about the medicine, with practical recommendations/advices concerning driving and medicines (patient letter and fact-sheet).
- ✓ Automatically generated warning icon that appears whenever the physician wants to prescribe a category I, II or III medicine.
- ✓ Registration of the signals and which of these activities have been used for the patient.

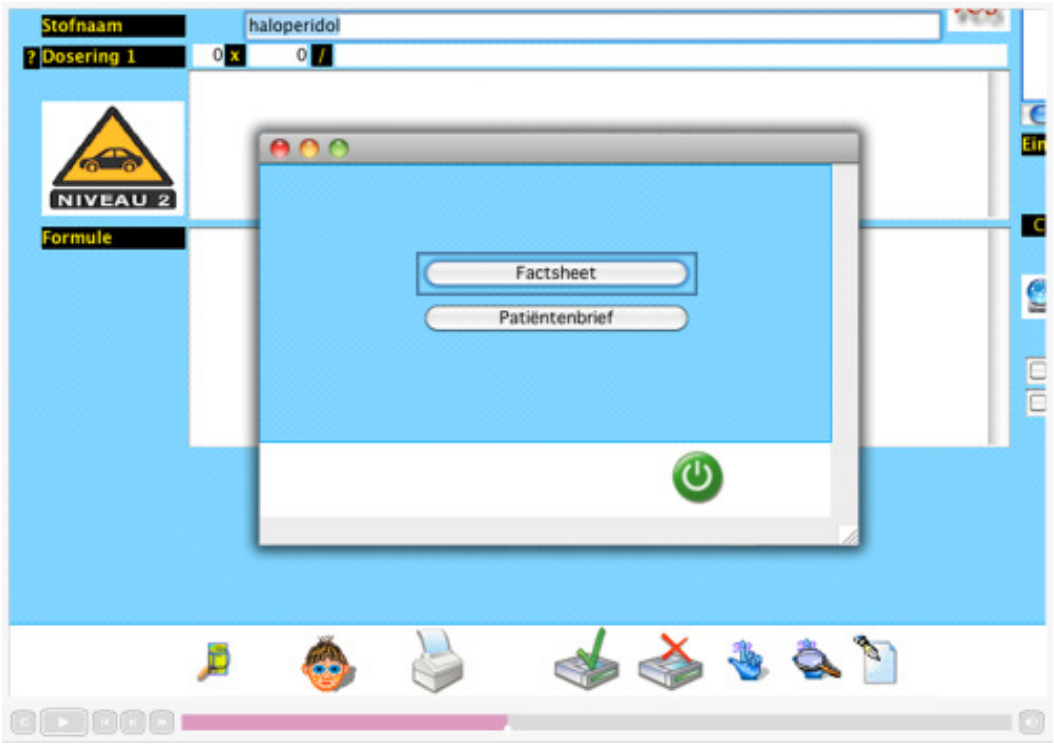

Figure 4 – Example of the Belgium SoSoeMe tool (for physicians).

ViaNova (Belgium)

DRUID guidelines and protocols were implemented in the Belgian pharmacy system ViaNova which supports the delivery of medicines and contributes to educate pharmacists about the main issues of medicines. When delivering such medicines, the ViaNova system offers support in the following ways:

- ✓ EUC signal – a first deliverable control signal appears at the first delivery of medicines when driving a car is not allowed at all or for a period of time. The signal only appears when safer alternatives are available.
- ✓ EUB signal (first delivery counselling signal) – refers to the information (concerning driving and medicines) that has to be told to the patient at the time of first delivery.
- ✓ TUB signal (second delivery counselling signal) – refers to the information and possible questions for counselling the patient during the second delivery of the medicine.
- ✓ Written information on the medicine, with practical recommendations or advice concerning driving under the influence of medicines.
- ✓ Warning signal that is automatically generated on the pharmacy label concerning the influence on reaction time as well as combination with alcohol.
- ✓ Registration of the signals and which of these activities have been used for the patient.

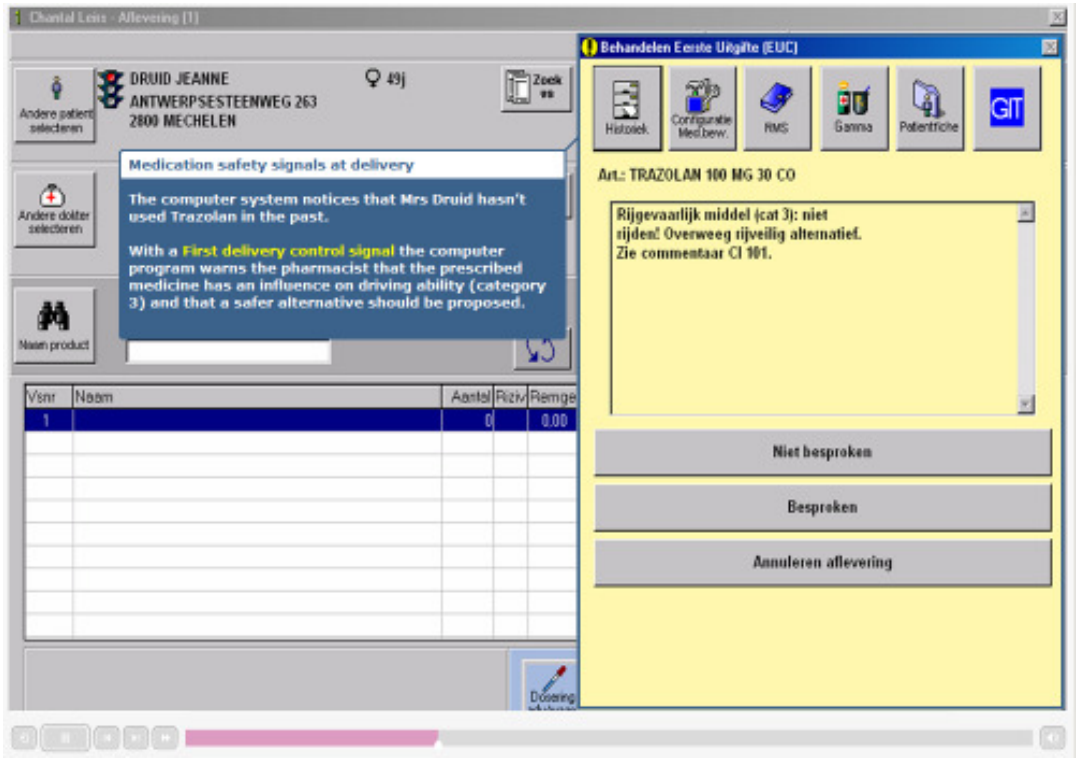

Figure 5 – example of the Belgium ViaNova tool (for pharmacists).

Pharmacom (the Netherlands)

DRUID protocols and guidelines were implemented in the Pharmacom® - system for medication surveillance in Dutch community pharmacy practice. The Pharmacom® - system supports pharmacists in the following ways:

- ✓ First-time dispensing check advises the pharmacist to look for safer alternatives, if existing.
- ✓ First-time dispensing counselling after selecting the medicine that will be delivered to the patient.
- ✓ Warnings that are displayed on the dispensing label as well as printouts of the patient information leaflet can be printed.
- ✓ Second-time dispensing counselling to provide information to the patient when there is a second delivery.
- ✓ Documentation for counselling activities.

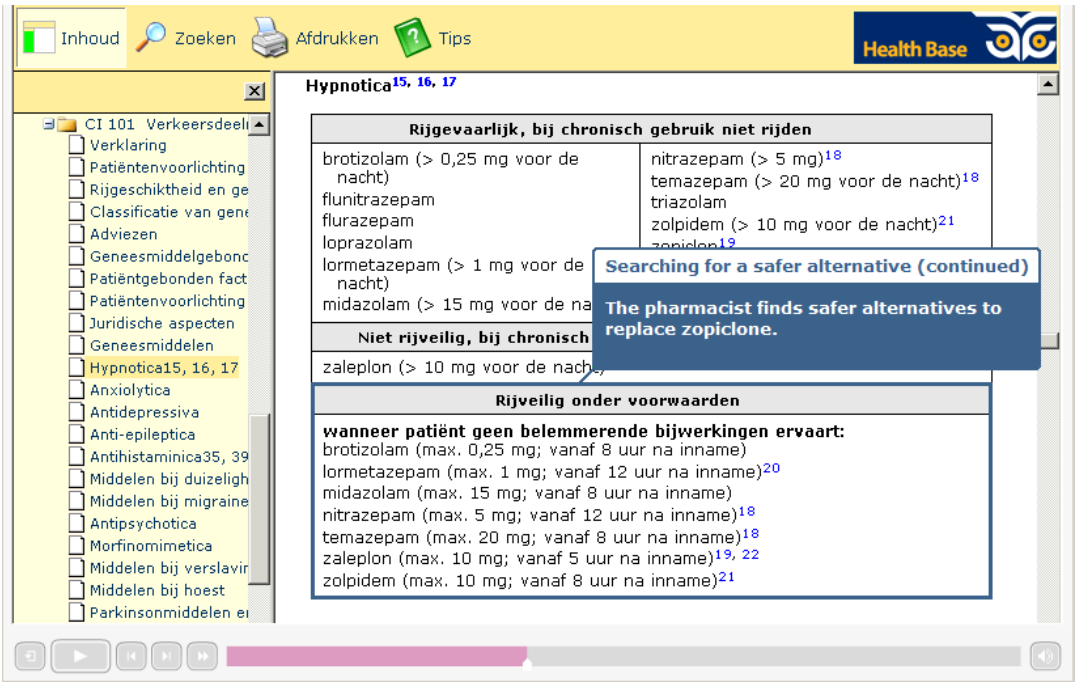

Figure 6 – example of the Dutch tool.

UVa (Spain)

Physicians (general practitioners) and pharmacist in Spain use ICT tools in their daily practice. However, as the health system is public, at this stage the DRUID tool (please see page 81 of this deliverable) was not possible to include within the existing software (like Medora for general practitioners).

The contents of the Spanish demo shows the following topics:

- ✓ the Spanish experience in the categorisation and labelling of medicines which affect the ability to drive.
- ✓ the principles of the rational prescription of medicines to patients who drive vehicles.
- ✓ the software tool developed during the DRUID project by the CERTH-HIT,

Centre for Research and Technology Hellas, Greece, including information about the Spanish pictogram.

Figure 7 – example of the Spanish demo.

7. Recommendations

Prescribing and dispensing guidelines should include information addressed to physicians, pharmacists or both.

For physicians, guidelines should include information:

- ✓ to inform the prescribing physician when more suitable alternatives exist, whenever the medicine that has been prescribed is likely to produce moderate or severe adverse effects or is presumed to be potentially dangerous.

- ✓ that the physician should be advised to prescribe the lowest effective dose of a particular psychoactive medicinal product and, if possible, to avoid multiple dosing during the day.

- ✓ that if the patient reports a lack of efficacy at the prescribed dosage, the physician be advised to consider an alternative medication rather than increasing the dose. If, however, there is no satisfactory alternative and a higher dose is therefore required, the patient be advised to take the largest part of the prescribed daily dose at bedtime.

For pharmacists, guidelines should include information:

- ✓ that pharmacists should discuss with prescribing physicians what patient information (written and oral) should be provided with the first supply of each medicine likely to cause impairment of performance.

- ✓ that encourages pharmacists to use published evidence to highlight differences in effect on driving performance of various medicines within the same therapeutic class.

- ✓ that pharmacists should provide information, additional to that provided by the manufacturer, to clarify the warnings about any potential effect on driving performance.

- ✓ to monitor the patient's experience of driving while taking a medicine, for example when the first repeat supply is requested and report appropriately to the prescribing physician or ask the patient to do so.

<u>For both physicians and pharmacists, guidelines should include information:</u>

- ✓ to make it clear that the use of some psychotropic medicines has been associated with an increased risk of causing an accident leading to injury and that patients should receive this information.

- ✓ to explain to the patient that poly-therapy with psychoactive medicines will almost certainly impair the ability to drive or operate machinery safely, and to avoid doing so if treatment cannot be adjusted.

- ✓ to inform the patient, when appropriate, that combination use with alcohol and/or illicit drugs increases impairment.

- ✓ to advise patients about the ways they can recognise signs of impaired driving performance, if it is impossible to avoid them taking a medicine that will obviously impair performance, or one with an unknown potential for impairment.

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Annex 1

Questionnaire sent to the National Organisations of Physicians

Questionnaire for National Organizations of Physicians

PRESCRIBING GUIDELINES REGARDING MEDICATION WITH IMPAIRING EFFECTS ON DRIVING PERFORMANCE

DRUID task 7.2
Version 3. 2009.01.28

It has been known for many years that the consumption of psychoactive substances such as alcohol and/or illicit drugs has a negative effect on the ability to drive and is one of the major causes of road accidents. The number of accidents that can be attributed to psychotropic substances (alcohol, drugs and certain medicines) is constantly high and alcohol abuse and the use of drugs and medicine is increasing.

Therefore, special efforts are needed in order to have a better knowledge of the various aspects of this problem and to develop appropriate solutions. The EU-project under the acronym of DRUID (Driving under the Influence of Drugs, Alcohol and Medicines) enrols 19 countries (18 European Union member states and Norway) and aims to combat the scourge of drink-driving and find answers to the question of the use of drugs or medicines that affect people's ability to drive safely (for further information, please check the website: www.druid-project.eu).

One of DRUID goals is to develop guidelines and information materials for health care providers, patients and users of psychoactive substances other than alcohol or illicit drugs. To do so, it is crucial to know the current situation in the different EU countries.
By means of this questionnaire survey we would like to know whether your professional organization has developed any prescribing guidelines in your country. We would then understand the current situation in each European Union country.

This questionnaire survey, sponsored by the EU, is carried out by the University of Groningen, the Netherlands in collaboration with CPME. The overall objective of the study is to contribute to traffic safety, based on improving practical information about the use of medicines that might impair driving performance.

We would greatly appreciate your cooperation by completing this questionnaire. Filling in the questionnaire will take approximately 10 minutes of your time.
PLEASE SEND THIS QUESTIONNAIRE BEFORE FEBRUARY, 28th TO: S.P.Monteiro@rug.nl

General Information about the professional organization

Name of the professional organization: _____

Name of the contact person: _____

Email address of the contact person: _____

Address: _____

Country: _____

Prescribing guidelines regarding driving impairing medication

1. Has your professional organization developed any prescribing guidelines concerning drugs and driving?

- ❑ Yes
- ❑ No
- ❑ Don't know

2. Did your professional organization ever consider developing such prescribing guidelines?

- ❑ Yes

  If yes, please specify how those guidelines have been positioned for use or dissemination:

  _____

  _____

  _____

- ❑ No

  If no, please specify why not:

  _____

  _____

  _____

- ❑ Don't know

If not, this questionnaire is over (after answering to questions 1 and 2). Thank you for your time. We appreciate to receive this questionnaire even if the remaining questions are not answered.

3. What was the main target group of the prescribing guidelines? *(please select all options that apply)*

- ❑ General Practitioners
- ❑ Medical Specialists
- ❑ Other health care providers, please specify: _____
- ❑ Patients
- ❑ Others, please specify: _____

4. Are the dispensing guidelines accessible to people other than physicians?

- ❑ Yes
- ❑ No
- ❑ Don't know

5. Have there ever been any efforts in your country to evaluate the impact of the above mentioned guidelines?

- ❑ Yes

  If yes, please give a short description of the evaluation and the literature reference where it has been published (any language will do):

  _____

  _____

  _____

- ❑ No

❑ Don't know

6. Would you be well willing to provide us with the guidelines you have available in your country, including the ones that are not published?

❑ Yes, I will send the materials to the address mentioned bellow

❑ No

❑ Don't know

7. Did your professional organization collaborate with **organizations of pharmacists** in order to develop joint statements or guidelines referring to how to prescribe and dispense medicines that might affect /impair driving?

❑ Yes

If yes, please specify and make references and/or send the relevant materials to the address bellow:

_____

_____

_____

❑ No

❑ Don't know

8. Did your professional organization collaborate **with patient organizations or any other organizations** in order to develop joint statements or guidelines referring to how to prescribe and dispense medicines that might affect /impair driving?

- ❑ Yes

  If yes, please specify and make references and/or send the relevant materials to the address bellow:

  _____

  _____

  _____

- ❑ No
- ❑ Don't know

9. Has your professional organization developed (or plan to develop) any other initiatives to enhance prescribing practices with regards to medicines and driving?

- ❑ Yes

  If yes, please specify and make references and/or send the relevant materials to the address bellow:

  _____

  _____

  _____

- ❑ No
- ❑ Don't know

Thank you very much for completing this questionnaire!!!

PLEASE SEND THIS QUESTIONNAIRE AFTER COMPLETION BEFORE FEBRUARY 20TH TO:

Susana Monteiro

Email address: S.P.Monteiro@rug.nl

PLEASE FEEL FREE TO ATTACH ANY OTHER ADDITIONAL DOCUMENTS.

Annex 2

Questionnaire sent to the National Organisations of Pharmacists

Questionnaire for National Organizations of Pharmacists

DISPENSING GUIDELINES REGARDING MEDICATION WITH IMPAIRING EFFECTS ON DRIVING PERFORMANCE

DRUID task 7.2
Version 3. 2009.01.28

It has been known for many years that the consumption of psychoactive substances such as alcohol and/or illicit drugs has a negative effect on the ability to drive and is one of the major causes of road accidents. The number of accidents that can be attributed to psychotropic substances (alcohol, drugs and certain medicines) is constantly high and alcohol abuse and the use of drugs and medicine is increasing.

Therefore, special efforts are needed in order to have a better knowledge of the various aspects of this problem and to develop appropriate solutions. The EU-project under the acronym of DRUID (Driving under the Influence of Drugs, Alcohol and Medicines) enrols 19 countries (18 European Union member states and Norway) and aims to combat the scourge of drink-driving and find answers to the question of the use of drugs or medicines that affect people's ability to drive safely (for further information, please check the website: www.druid-project.eu).

One of DRUID goals is to develop guidelines and information materials for health care providers, patients and users of psychoactive substances other than alcohol or illicit drugs. To do so, it is crucial to know the current situation in the different EU countries.
By means of this questionnaire survey we would like to know whether your professional organization has developed any dispensing guidelines in your country. We would then understand the current situation in each European Union country.

This questionnaire survey, sponsored by the EU, is carried out by the University of Groningen, the Netherlands in collaboration with PGEU. The overall objective of the study is to contribute to traffic safety, based on improving practical information about the use of medicines that might impair driving performance.

We would greatly appreciate your cooperation by completing this questionnaire. Filling in the questionnaire will take approximately 10 minutes of your time.
PLEASE SEND THIS QUESTIONNAIRE BEFORE FEBRUARY, 20th TO: S.P.Monteiro@rug.nl

General Information about the professional organization

Name of the professional organization: _____

Name of the contact person: _____

Email address of the contact person: _____

Address: _____

Country: _____

Dispensing guidelines regarding driving impairing medication

1. Has your professional organization developed any dispensing guidelines concerning drugs and driving?

   ❑ Yes

   ❑ No

   ❑ Don't know

2. Did your professional organization ever consider developing such dispensing guidelines?

   ❑ Yes

   If yes, please specify how those guidelines have been positioned for use or dissemination:

   _____

   _____

   _____

   ❑ No

   If no, please specify why not:

   _____

   _____

   _____

   ❑ Don't know

If not, this questionnaire is over (after answering to questions 1 and 2). Thank you for your time. We appreciate to receive this questionnaire even if the remaining questions are not answered.

3. What was the main target group of the dispensing guidelines? *(please select all options that apply)*

- ❑ Community pharmacists
- ❑ Hospital pharmacists
- ❑ Other health care providers, please specify: _____
- ❑ Patients
- ❑ Others, please specify: _____

4. Are the dispensing guidelines accessible to people other than pharmacists?

- ❑ Yes
- ❑ No
- ❑ Don't know

5. Have there ever been any efforts in your country to evaluate the impact of the above mentioned guidelines?

- ❑ Yes

  If yes, please give a short description of the evaluation and the literature reference where it has been published (any language will do):

  _____

  _____

  _____

- ❑ No
- ❑ Don't know

6. Would you be well willing to provide us with the guidelines you have available in your country, including the ones that are not published?

   ❑ Yes, I will send the materials to the address mentioned bellow

   ❑ No

   ❑ Don't know

7. Did your professional organization collaborate with **organizations of physicians** in order to develop joint statements or guidelines referring to how to prescribe and dispense medicines that might affect /impair driving?

   ❑ Yes

   If yes, please specify and make references and/or send the relevant materials to the address bellow:

   _____

   _____

   _____

   ❑ No

   ❑ Don't know

8. Did your professional organization collaborate **with patient organizations or any other organizations** in order to develop joint statements or guidelines referring to how to prescribe and dispense medicines that might affect /impair driving?

❑ Yes

If yes, please specify and make references and/or send the relevant materials to the address bellow:

_____

_____

_____

❑ No

❑ Don't know

9. Has your professional organization developed (or plan to develop) any other initiatives to enhance dispensing practices with regards to medicines and driving?

❑ Yes

If yes, please specify and make references and/or send the relevant materials to the address bellow:

_____

_____

_____

❑ No

❑ Don't know

Thank you very much for completing this questionnaire!

PLEASE SEND THIS QUESTIONNAIRE AFTER COMPLETION BEFORE FEBRUARY 20TH TO:

Susana Monteiro

Email address: S.P.Monteiro@rug.nl

PLEASE FEEL FREE TO ATTACH ANY OTHER ADDITIONAL DOCUMENTS.