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2024 Health Advice **Guideline** on **Work-Related Road Safety**

GOBIERNO DE ESPAÑA
MINISTERIO DEL INTERIOR
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INTRODUCTION

Since 2010, when the previous Heath Advice Guideline on Work-Related Road Safety was published, significant progress has been made in the field of road safety in our country. However, road accidents continue to occur.

According to data from the 2022 Report on Work-Related Road Accidents published by the Spanish National Institute of Occupational Safety and Health, 27.3% of fatal work-related accidents currently take place on the roads. Drivers and mobile machinery operators report the highest number of road accidents during working hours, at 36.2%. The incidence of work-related commuting accidents is 2.2 times greater than the incidence of work-related road accidents during working hours.

Since the aforementioned year of 2010, the Law on the prevention of occupational risks has been in force and a culture of prevention has been implemented in workplaces, along with risks assessments and preventive plans in companies, which increasingly include road safety.

The current Road Safety Strategy 2030, unveiled by the Minister of the Interior on 9 June 2022, marks a new milestone in promoting road safety and achieving the objectives of reducing road accidents in Spain. This strategy sets out different lines of action together with measures to achieve, among other goals, more “Trained and skilled” road users in Spain.

The strategic action line “Improving the assessment of mental and physical conditions and introducing health intervention for the treatment of recidivism” envisages updating the protocol for assessing drivers’ mental and physical skills (Annex IV of the General Regulation on Drivers) and also establishes guidelines for providing healthcare professionals with materials and resources to improve health advice given to patients, in particular regarding driving risks associated with certain diseases and the use of medication.

The 2010 Guideline was based on the driver assessment protocol applicable at the time. This 2024 Heath Advice Guideline on Work-Related Road Safety includes the protocol updated in 2022 and, like its predecessor, is intended to be a brief, clear and quick reference tool enabling healthcare professionals to make informed decisions regarding the prevalence of the disease on road safety, the effects of treatment and to provide the best medical advice to patients.

As was the case in 2010, it is now essential to step up efforts and collaboration between public authorities, companies, workers, social partners and the society at large, by designing and implementing actions that help to reduce road accidents.

The maximum dissemination and use of this Guideline offer a new opportunity to further promote road safety.

PERE NAVARRO OLIVELLA
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2024 Health Advice **Guideline** on **Work-Related Road Safety**

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OBJECTIVES OF THE GUIDELINE

The primary objective of this Guideline is to facilitate the provision of tailored road-safety-related health advice in any field of private or public medicine, both in primary and specialised care, as a preventive measure to reduce risks attributable to mental and physical skills (conditions) and attitudes (behaviours) that make up the human factor aspects present in road accidents. Studies on road accidents conclude that the human factor is present in 70-90% of cases. They find that the people involved, through their risky decisions and behaviours, whether conscious or not, active or passive, have played a role in the origin, development or outcome of the accident.

Through personalised advice on serious or chronic health issues, both professional and private drivers can avoid risks that could lead to road accidents.

Inappropriate decisions resulting in risk behaviours due to inadequate mental or physical conditions can be prevented when their consequences are known.

The primary objective will be furthered through healthcare collaboration in order to:

Identify road risk factors related to diseases and/or impairments found in PATIENTS AND WORKERD.

Inform and warn PATIENTS AND WORKERS diagnosed with diseases/impairments covered by the Regulation on Drivers (Royal Decree 818/2009 of 8 May) of the legal implications of these diseases.

Provide personalised health advice on road safety.

Comply with the regulation on occupation risk prevention, in OCCUPATIONAL MEDICINE services and occupation risk prevention services.

As HEALTHCARE PROFESSIONALS, we can identify, assess and prevent risks that may affect PATIENTS and WORKERS. Health monitoring makes it possible to record driving habits and changes in mental and physical conditions with a probable impact on driving ability in both general and occupational clinical history; assess risk factors related to diseases and their treatment, promoting control over them; identify and assess risk behaviours associated to health habits (alcohol and substance use); eating, rest and sleep habits; and prescribe medication in a responsible manner that does not compromise road safety.

For reasons outlined above, healthcare professionals play a pivotal role in preventing traffic-related injuries by promoting interventions that ensure adequate protection of health and road safety.

This new updated edition of the Guideline aims to improve the objectives of both general and occupational road accident PREVENTION.

INSTRUCTIONS FOR USE

The guideline comprises 21 units. Unit 0 serves as a model structure and provides general advice that can be given to workers who, whilst not suffering from any chronic disease or impairment, may experience acute conditions (flu, colds, trauma, inflammation, fever, non-specific joint pain, etc.) and should be aware of health advice on road safety in order to avoid risks that could be attributed to temporary indispositions of their mental or physical condition.

The remaining units, 1 to 20, are sorted alphabetically.

Each unit comprises four sections, identified by capital letters (A, B, C and D), which repeatedly provide the following information about each disease or impairment:

A. How does this disease-impairment affect the ability to drive?
B. Effects of treatment on driving
C. Regulatory reference
D. Advice for drivers

The unit number precedes the letter representing each section.

E.g.: the sections of unit 0 are named:

0. A. How does the disease-impairment affect the ability to drive?
0. B. Effects of treatment on driving
0. C. Regulatory reference
0. D. Advice for drivers

Units containing more than one disease, e.g. unit 13, are sorted according to the following pattern:

Unit number, followed by 1, 2, 3, etc., corresponding to the diseases covered by each unit, followed by A, B, C, D (each of the four sections).

E.g.: **Unit 13 NEUROLOGICAL DISEASES:**

13.1 EPILEPSY AND SEIZURES
13.2 PARKINSON'S DISEASE
13.3 NEUROMUSCULAR DISEASES

13.1 EPILEPSY AND SEIZURES
- 13.1.A. How does it affect the ability to drive?
- 13.1.B. Effects of treatment on driving
- 13.1.C. Regulatory reference
- 13.1.D. Advice for drivers with epilepsy or seizures

The structure of the Guideline can be consulted independently, responding to the four possible questions offered by each of the four sections of each unit.

Sections A and B provide information for healthcare professionals.

Section C provides information for healthcare professionals and the following drivers:

Group 1 drivers° (non-professional)
Group 2 drivers° (professional)*

Section D provides advice for drivers and is intended for the driver concerned.

Unit 20: Usefulness of passive safety systems, does not include (for obvious reasons) section B.

Out of the 21 units in the Guideline, 17 cover diseases and impairments included in current Spanish regulations (Royal Decree 818/2009 of 8 May) and its updates, which are grounds for refusal, modification or restriction of a driving licence. Listed alphabetically, they are:

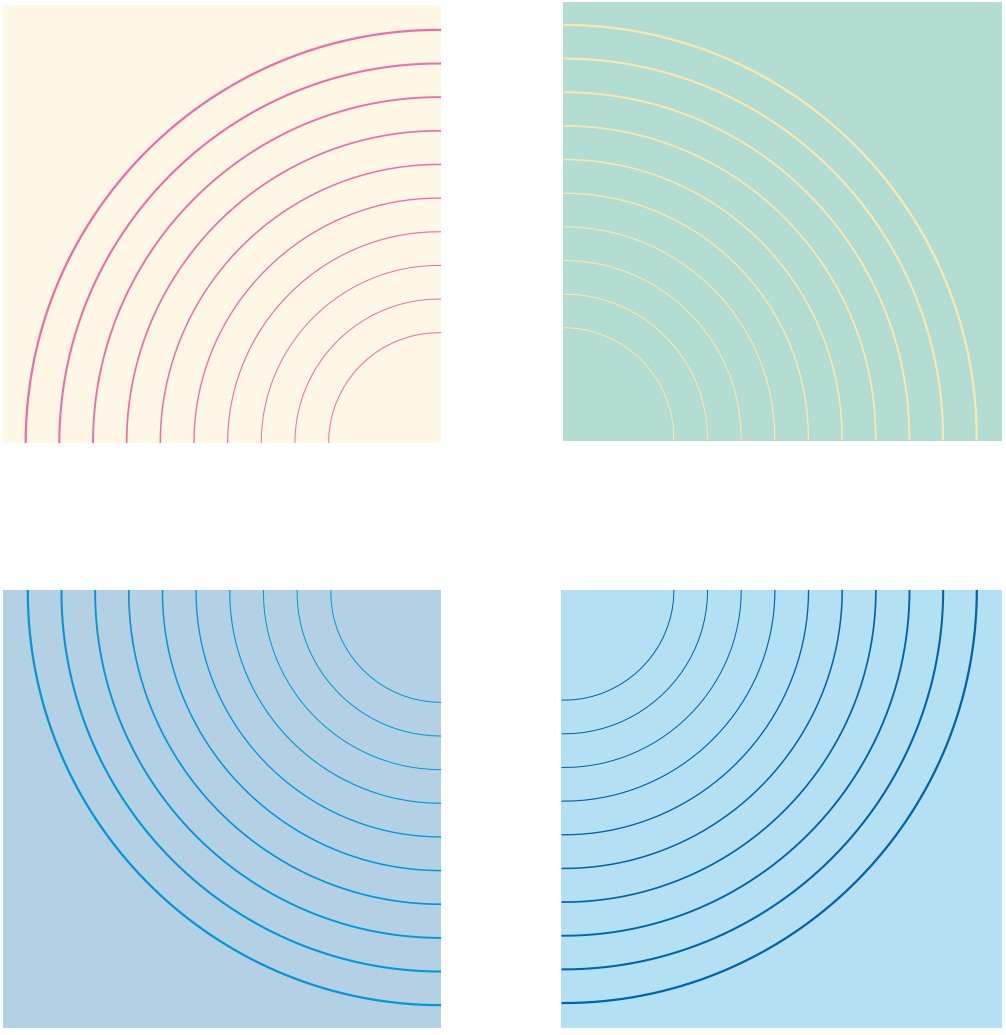
Unit 1: Alcohol and driving
Unit 2: Hearing and balance impairments
Unit 3: Visual impairments
Unit 4: Motor system impairments: Disability-height
Unit 5: Substance use:Drugs of abuse and drug addiction
Unit 7: Cardiovascular diseases
Unit 8: Cerebrovascular diseases. Stroke.
Unit 9: Haematological diseases
Unit 10: Mental and behavioural disorders. Psychiatric disorders
Unit 11: Metabolic diseases: Diabetes Mellitus
Unit 12: Neoplastic disease (Oncological processes)
Unit 13: Neurological diseases
Unit 14: Kidney diseases
Unit 15: Respiratory diseases
Unit 16: Medication and road safety
Unit 17: Other disorders
Unit 19: Sleep disorders

In addition, the Guideline contains four other units:

Unit 0: Disease and driving
Unit 6: Pregnancy and driving
Unit 18: Age-related disorders

Unit 20: Usefulness of Passive Safety Systems

(*) Although the regulations differ depending on whether it is a Group 1 or Group 2 driving licence, we will bear in mind when assessing working conditions and providing road safety advice that, in the case of a driver with a Group 1 licence who uses the vehicle as a work tool, an assessment is recommended, taking into account the criteria corresponding to Group 2, at least with regard to the provision of advice.



UNIT 0. DISEASE AND DRIVING

O.A. How does it affect the ability to drive?

Certain diseases, pathological processes and insufficiently controlled or unbalanced treatments can lead to high-risk behaviour on the road. This is the case with irregular mental processes, exacerbations of diseases (neuromuscular, sudden cardiovascular events, decompensations in metabolic diseases, irregular tolerance to medications, etc.), acute processes (flu, colds, muscle spasms, pain of any origin, etc.), as well as voluntary or involuntary neglect of the usual treatment for any disease (discontinuation or change of usual medication, inadequate food intake, alcohol/substance abuse, forced or changing work patterns, lack of night-time rest, etc.).

In road traffic, the integration of people (drivers, pedestrians, passengers), vehicles, roads and the environment is a constantly changing scenario. The variability of traffic situations reaches different levels of risk, which can be modified by all elements, but especially by people.

When referring to scientific evidence in traffic medicine, it is necessary to refer to the report by the Monash University Accident Research Centre, which compiles, reviews and interprets the evidence for each of the psychophysical conditions analysed, concluding that the evidence obtained is limited for most diseases and varies according to each condition. This report draws some conclusions that are of great interest for a better understanding of what is sought with the 'assessment of psychophysical conditions'. On the one hand, not all medical conditions pose the same risk to road safety, nor will all people suffering from a condition see their driving ability affected to the same extent. Therefore, they consider that it is not the psychophysical conditions themselves that affect driving, but rather the functional impairments associated with these medical conditions that interfere with safe driving. However, we must not forget the compensatory mechanisms that people are able to develop to adapt to these functional impairments and minimise road risk.

O.B. Effects of treatment on driving

The leaflet accompanying medicines warns, in accordance with regulations, of the adverse effects on the use of machinery and driving that may result from taking certain medicines.

The warning is often unsuccessful, as the leaflet is not always read properly. This may be due to carelessness (not reading it) or for various other reasons, such as difficult language, small print, etc.

On 11 October 2007, Royal Decree 1345/2007 was approved, regulating the authorisation procedure, registration and conditions for dispensing industrially manufactured medicines for human use (BOE No. 267, of 7 November). This Royal Decree establishes that medicinal products that may impair the ability to drive or operate dangerous machinery must bear a pictogram on their packaging to warn of the road safety risk (Royal Decree 717/2019, of 5 December, amending Royal Decree 1345/2007, of 11 October, regulating the

authorisation procedure, registration and conditions for the dispensing of industrially manufactured medicinal products for human use).

Sedatives:	drowsiness, decreased alertness, increased reaction time
Anticholinergics:	drowsiness, headache, dizziness, blurred vision
Stimulation reactions:	muscle spasms, dizziness, insomnia, nervousness, irritability, tremor, and tachycardia
Neuropsychiatric reactions:	anxiety, depression, hallucinations, psychosis, behavioral changes
Extrapyramidal and psychomotor coordination manifestations:	muscle spasms, agitation, seizures, motor incoordination
Hearing disturbances:	tinnitus, ringing in the ears, transient hearing loss
Circulatory disturbances:	arrhythmias, hypotension, cardiac arrest
Hypoglycemia:	palpitations, sweating, anxiety, blurred vision, nausea, seizures, coma
Ophthalmological disturbances:	blurred vision, accommodation disorders

Medicines can affect drivers with varying degrees of risk:

LEVEL I (Moderate risk)
LEVEL II (Severe risk)
LEVEL III (Very severe risk)

O.C. Regulatory reference

The current regulation on mental and physical aptitude for obtaining and renewing driving licences (Royal Decree 818/2009 of 8 May) comprises 14 sections, which constitute Annex IV, a text that sets out the mental and physical aptitude criteria required for driving. The 14 sections describe:

1. *Visual acuity*
2. *Hearing ability*
3. *Locomotor system function*
4. *Cardiovascular system function*
5. *Haematological system function*
6. *Renal system function*
7. *Respiratory system function*
8. *Metabolic system function*
9. *Nervous system function*
10. *Absence of mental illness*
11. *Absence of substance-related disorders (alcohol, toxic substances and medication)*
12. *Absence of perceptual-motor disorders*
13. *Absence of any other illness not covered in the previous sections that could affect road safety*
14. *Non-haematological oncological processes*

Each section, in turn, comprises a variable number of subsections, which cover diseases, impairments, disorders, alterations, etc., considered to be a potential road risk for the Spanish Driver Assessment Model.

The regulations establish 'normal' or 'acceptable' benchmark values to determine driving ability for each of the diseases, impairments, disorders, deficiencies, deprivations, absences, deteriorations, etc., and the restrictive conditions when the benchmark conditions are not met, whereby the set of considerations in all sections forms the assessment criteria for determining driving ability. Thus, in the case of sensory impairments, corrections to visual and/or hearing acuity are applied and, in the other sections in general, at the discretion of the medical practitioner, the following may be applied: shortening the period of validity, limiting the speed and/or adapting the vehicle to the functional capabilities detected in the driver, restricting driving to a specific area, etc.

Since the publication of RD 818/2009, the following amendments have been made to Annex IV:

- Order PRE/2356/2010 (visual acuity, metabolic and endocrine diseases, nervous and muscular system)
- RD 1055/2015 (respiratory system, nervous and muscular system)
- Order PRA/375/2018 (cardiovascular system, haematological disorders, endocrine and metabolic diseases, other non-haematological oncological processes)

The regulations establish two levels of requirements:

Drivers in Group 1° (non-professional)
Drivers in Group 2° (professional)

Although Annex IV (the regulation) refers to 'restrictive conditions', we cannot ignore the fact that we are in a preventive healthcare context. This means that, although in terms of penalties it is adequate to speak of restrictive conditions, in the health and prevention field the correct term would be 'prescription of preventive measures', since they refer to the result of a health assessment that seeks to reduce road risk as a consequence of the human factor, whether due to illness, disability or pharmacological treatment.

Similarly, the distinction in the regulations (Group 1 and Group 2) is accurate, since it is not possible to specify and individualise personal criteria in a regulation. However, in our understanding of this regulation in the healthcare field, we must individualise and specify preventive criteria based on risk, and when we talk about risk, we need to differentiate further. Thus, it must be considered that within Group 1 there are licences that are used by people who use the vehicle as a work tool. In these cases, the risk should be assessed using criteria similar to those for Group 2, at least as far as road health advice is concerned.

Certain criteria can help differentiate between drivers when offering road health advice based on risk exposure. Some publications recommend classifying drivers who meet any of the following criteria as professional drivers: >36,000 km/year; >720 hours/year of driving; their vehicle weighs more than 11,000 kg; or if driving is their livelihood, assessing the probability of a risk event occurring while driving and whether this could be the cause of an accident. In this regard, it should be remembered that if driving is less than 3,000 km/year, road risk increases due to loss of driving practice and interaction with traffic.

O.D. Advice for drivers in the event of disease

Drivers who do not meet or only partially meet the mental and physical requirements for obtaining and renewing their driving licence, as set out in Annex IV of Royal Decree 818/2009 of 8 May, may not drive or must drive with restrictions.

If you suffer from any acute or chronic disease or impairment, you should consult your occupational doctor about the possible influence of this or its treatment on road safety.

Have an honest discussion with your doctor to decide together on the safest driving guidelines based on your current state of health.

You should be aware of the driving warnings for any medication you take occasionally (painkillers, anti-inflammatories, muscle relaxants, etc.). Be very aware of possible side effects.

Find out about the liability you may incur if you fail to comply with current employment or traffic regulations. If you are on sick leave and work as a driver or your job requires you to drive, you should find out whether you are in breach of any legal obligations by driving during your sick leave.

When returning to work after a period of sick leave, inform your occupational doctor of the reasons for your absence and how your condition is being managed, in case a new aptitude certificate is required for your job.

Do not drink alcohol if you are going to drive. The effects of alcohol are the number one risk factor for road safety. Before driving, bear in mind that, according to data provided by the Spanish National Institute of Toxicology for 2022, 51.9% of drivers who died in accidents had consumed alcohol, drugs and/or psychotropic drugs. For the first time, the number of deceased drivers who tested positive for substances exceeded those who tested negative.

If you need corrective measures, adaptations and/or restrictions to drive, these will be shown on the back of your licence using a combination of numbers and letters. You will have been informed of these at the Driver Assessment Centre and remember that you must comply with them to avoid liability.

Restraint systems (seat belts, airbags and headrests) are designed to reduce the severity of injuries and even fatalities in the event of a collision. They act to prevent risk when used correctly, are complementary and are activated according to the type of collision. Nowadays, Advanced Driver Assistance Systems, better known as ADAS, are a suite of innovative technological solutions integrated into vehicles to improve safety.

If you are suffering from an acute condition that causes discomfort, pain, fever, etc. and you cannot avoid driving, increase your safety distance; do not exceed the speed limit and take a break after driving for a maximum of one hour; take extreme caution at crossings, intersections and when merging into fast lanes, and avoid forced manoeuvres and risky and unnecessary overtaking.

UNIT 1. ALCOHOL AND DRIVING

Data published by the National Institute of Toxicology and Forensic Sciences, in collaboration with the National Road Safety Observatory, on toxicological findings in traffic accident casualties show that more than half (51.9%) of drivers killed on the roads in 2022, who underwent autopsy and toxicological analysis tested positive for alcohol, drugs or psychotropic drugs, either alone or in combination, a percentage that represents an increase of 2.5% over the previous year.

1.A. How does it affect the ability to drive?

The effects of alcohol on the ability to drive are directly proportional to its concentration in the blood and can be classified as follows:

- **Visual and perceptual effects**: alcohol impairs eye accommodation, the ability to follow objects with the eyes, reduces the visual field and increases recovery time after glare.

- **Effects on the psychomotor function and abilities of the driver**: it increases reaction time, impairs hand-eye coordination, alters attention and perception of speed and distance, and reduces the ability to respond to unexpected traffic situations.

- **Effects on behaviour and conduct**: alcohol causes overestimation of abilities and increased risk-taking, with a decrease in responsibility, leading to more reckless behaviour due to impulsive and aggressive attitudes, with a higher number of offences.

Alcohol use disorders have a multisystemic impact. Their symptoms, combined in various ways and with varying degrees of severity, significantly impair the ability to drive by causing:

- Progressive decline in motor and cognitive functions.
- Alternating symptoms of psychosis, depression, anxiety, pseudodementia, personality disorders, etc.
- Neurological disorders: seizures, limb neuropathies.
- Frequent associated comorbidities: hypertension resistant to antihypertensive treatment, arrhythmias, heart failure, etc.
- States of mental confusion.
- Motor impairments: tremors, increased incidence of traumatic injuries, Dupuytren's contracture, etc.
- Endocrine-metabolic disorders: diabetes, nutritional deficiencies, etc.

Chronic abusive consumers are often unaware that their drinking is excessive. When there are clinical signs of alcohol abuse, it is essential to determine the quantity consumed and inform the patient of their abuse, in case a brief counselling programme on alcohol consumption is necessary.

Remember that one standard drink (SDU) is equivalent to 10 grams of alcohol, which is the alcohol content of a small glass of beer, a glass of wine, a glass of champagne or half a glass of whisky or distilled spirit (gin, rum, etc.).

A weekly consumption of between 35 and 50 SBUs is clearly high-risk for driving and difficult to separate from driving.

Many repeat drivers involved in accidents are drivers with problems related to excessive alcohol consumption.

In cases of risky consumption, signs and symptoms compatible with abuse may be observed, which, when added to altered biological markers such as MCV, GOT, GPT, GGT, CDT, etc., and possible previous incidents related to road risk, indicate the need for referral to specific treatment, advise against driving and, if necessary, determine temporary UNFITNESS to drive until there is good adherence to treatment, consumption is reduced and a positive attitude towards changing behaviour towards consumption is observed.

Remember to include the patient's driving habits in their occupational medical history if they have problems related to alcohol consumption.

Table 2.

Effects of alcohol on driving vehicles according to the level of blood alcohol content

Risk zone begins: blood alcohol level (BAC) of 0.3 to 0.5 g/l
Emotional excitability
Decreased mental acuity and judgment
Relaxation and a sense of well-being
Impaired eye movements
Alert zone: BAC of 0.5 to 0.8 g/l
Delayed general reaction time
Altered reflexes
Onset of motor disturbance
Euphoria, relaxation, and well-being
Tendency toward emotional inhibition
Onset of impulsivity and aggressive driving
Dangerous driving: BAC of 0.8 to 1.5 g/l
Significant state of intoxication
Very impaired reflexes, delayed responses
Loss of precise control of movements
Serious coordination problems
Difficulty concentrating visually
Notable decrease in vigilance and risk perception
Highly dangerous driving: BAC of 1.5 to 2.5 g/l
Clear intoxication with possible narcotic effects and confusion
Unpredictable behavioral changes: psychomotor agitation
Severe psychosensory disturbances and marked mental confusion
Double vision and hesitant behavior
Impossible driving: BAC >3 g/l
Profound intoxication
Stupor with analgesia and progressive unconsciousness
Abolition of reflexes Paralysis and hypothermia
Can lead to coma

Directorate General of Traffic. Study on the reduction of blood alcohol limits. Working Group. Madrid: Higher Council for Traffic and Road Safety, 1998.

1.B. Effects of treatment on driving

Medicinal products used in alcohol withdrawal, alcohol aversive agents such as disulfiram, calcium carbimide and naltrexone, among others, are classified as level 2 moderate risk in the Druid classification due to side effects on driving.

In addition to the above, medication commonly used to treat accompanying conditions, such as anxiolytics, sedatives, antidepressants, antipsychotics, etc., should also be added. This psychotropic medication also has significant side effects on driving, which are further enhanced by alcohol. All of these will display the pictogram relating to road safety on the medication packaging.

Specific information on the road risk posed by the medicines mentioned can be found in the consensus document on medication and driving in Spain, which is available online at:
https://www.aemps.gob.es/industria/etiquetado/conduccion/docs/Medicamentos_conduccion_DocConsenso.pdf

It is advisable not to drive during withdrawal treatment. Until the psychiatrist or psychologist monitoring your progress issues a favourable report.

1.C. Regulatory reference on alcohol misuse

Royal Legislative Decree 6/2015, of 30 October, BOE 261 OF 31-10-2015. Article 14 on alcoholic beverages and drugs establishes the rules governing the consumption of alcohol and other drugs while driving:

Drivers of any vehicle with blood alcohol levels above those established by law may not drive on the roads covered by this Law. Under no circumstances may drivers under the age of 18 drive with a blood alcohol level above 0 grams per litre or a breath alcohol level above 0 milligrams per litre. Nor may the driver of any vehicle do so while under the influence of drugs, excluding those substances used under medical prescription and for therapeutic purposes, provided that they are in a condition to use the vehicle in accordance with the obligation of diligence, caution and non-distraction.

Drivers are required to undergo tests to detect alcohol or drugs in their bodies, which will be carried out by law enforcement officers responsible for traffic surveillance. Other road users are also required to undergo these tests if they are involved in a traffic accident or have committed an offence.

Alcohol detection tests consist of checking exhaled air using authorised devices, and for the detection of drugs in the body, a saliva test using an authorised device and subsequent analysis of a sufficient sample of saliva. Where there are justified reasons preventing these tests from being carried out, a medical examination of the person concerned or the clinical tests deemed most appropriate by the doctors at the health centre to which they are transferred may be ordered.

At the request of the interested party, contrast tests may be carried out for the detection of both alcohol and drugs, which shall preferably consist of blood tests, except in duly justified exceptional cases. When the contrast test yields a positive result, the cost shall be borne by the interested party.

Healthcare professionals are obliged, in all cases, to report the results of these tests to the traffic authority of the province where the offence was committed or, where appropriate, to the competent bodies responsible for imposing penalties in the autonomous communities that have been transferred responsibility for traffic and motor vehicle regulations, or to the competent municipal authorities.

The blood alcohol limits in force, above which driving is not permitted, are as follows:

As a general rule, the limit is set at 0.5 g of alcohol per litre of blood (0.25 mg of alcohol per litre of exhaled air) for drivers of vehicles and bicycles.

For vehicles intended for the transport of goods weighing more than 3,500 kg, for vehicles intended for transporting passengers, public services, transporting minors and schoolchildren, dangerous goods or emergency services or special transport, as well as for any driver during the two years following obtainment of their driving licence, the maximum limit is 0.3 g per litre of blood (0.15 mg of alcohol per litre of exhaled air).

A zero alcohol limit may be imposed on certain drivers for medical or psychological reasons, at the discretion of the medical examination centre, regardless of the type of vehicle they drive. This is reflected in the driving licence with code 68.

There are devices that prevent the vehicle from starting if the driver blows over a certain blood alcohol level. Such devices are already in use in Spain in some passenger transport companies.

Traffic offences are regulated by the Criminal Code (Organic Law 10/1995 of 23 November on the Criminal Code and its amendments) in Articles 379 and 383 (Organic Law 15/2007, of 30 November, amending Organic Law 10/1995, of 23 November, on the Criminal Code in relation to road safety, 'B.O.E.' 1 December. Effective date: 2 December 2007).

Violations of the rules established in this provision are considered very serious and may entail, in addition to the corresponding fine, suspension of the driving licence.

The same penalties shall be imposed on anyone driving a motor vehicle or moped under the influence of toxic drugs, narcotics, psychotropic substances or alcoholic beverages. In any case, anyone driving with a breath alcohol level of more than 0.60 milligrams per litre or a blood alcohol level of more than 1.2 grams per litre shall be punished with the aforementioned penalties.

- Section 383. The driver who, when required to by a law-enforcement officer, refuses to submit to the legally established alcohol level tests, and those for the presence of toxic drugs, narcotics and psychotropic substances referred to in the preceding Articles, shall be punished with imprisonment of six months to one year and deprivation of the right to drive motor vehicles and mopeds for a term exceeding one and up to four years.

- Drivers of any vehicle may not exceed a blood alcohol level of 0.3 grams per litre or a breath alcohol level of 0.15 milligrams per litre during the two years following the date on which they obtained the driving licence or permit entitling them to drive.

- For these purposes, the length of time held by the driver of a motor vehicle in a category for which the licence is valid shall be taken into account only if the licence is sufficient for driving the vehicle in question

Group 1 drivers (non-professional) and Group 2 drivers (professional)

Section 11, substance-related disorders, of Annex IV of Royal Decree 818/2009 of 8 May, on the mental and physical aptitudes required to obtain or renew a driving licence, establishes that drivers with problems related to alcohol consumption (abuse, dependence, induced disorder, dementia, delirium, psychotic disorders) are not fit to obtain or renew their driving licence as they do not have the appropriate aptitudes to drive safely.

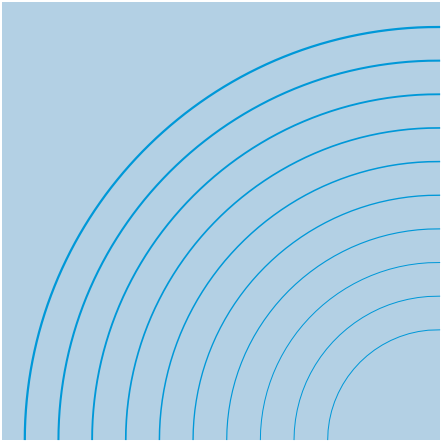
Abuse, dependence, induced disorder

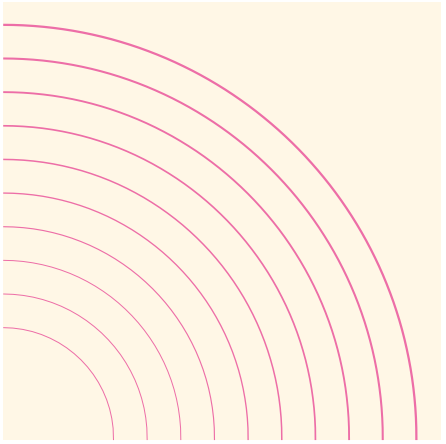
The current regulations are unambiguous regarding the assessment of these individuals' fitness to drive: alcohol abuse or any pattern of use in which the individual is unable to separate driving and alcohol consumption, dependence or alcohol-induced disorders are not permitted. Nor are cases of a history of abuse, dependence or induced disorders in which rehabilitation is not duly accredited permitted.

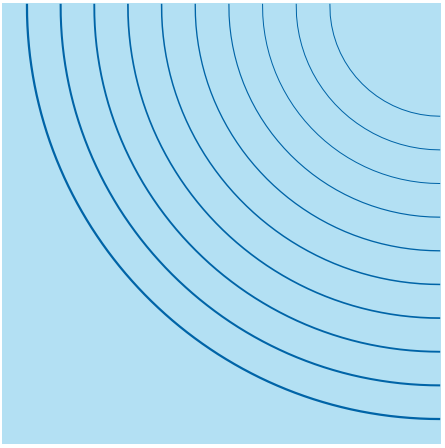
However, the regulation states: "In cases where there is a history of dependence or abuse, a driving licence may be obtained provided that the situation of dependence or abuse has ceased after a proven period of abstinence and there are no irreversible consequences that pose a risk to road safety. To ensure this, a favourable opinion from a psychiatrist, psychologist, or both, depending on the type of disorder, will be required." This also applies to alcohol-induced disorders.

1.D. Advice for drivers with alcohol misuse

- In general, the effects of alcohol are directly proportional to its concentration in the blood: the higher the concentration, the greater the impairment. Do not drive after consuming alcohol.
- Alcohol impairs and incapacitates a person's ability to drive safely.
- Alcohol has negative effects on driving, even below the legal limit.
- Alcohol increases the time our body needs to receive information, process it and respond to any traffic situation.
- People with alcohol-related problems (abuse, dependence, induced disorder) may be impaired in their ability to drive.
- Driving under the influence of alcohol is associated with an increased risk of traffic injuries.
- The rehabilitation of repeat drink-driving offenders and alcoholic patients with regard to their driving ability is a priority.
- The link between alcohol and traffic accidents is so strong that when a person has been involved in a traffic accident with injuries, we must assess whether or not that patient has problems related to alcohol consumption (harmful consumption, abuse, dependence, induced disorder).
- One in four drivers who break the law have drinking problems, and the first sign that a patient is a problem drinker may be a fine for driving under the influence of alcohol.
- If you are on sick leave and you are a professional driver or your job requires you to drive, you must find out whether you are in breach of any legal obligations by driving during your sick leave.







UNIT 2. HEARING AND BALANCE IMPAIRMENTS

2.1. Hearing loss
2.2. Vertigo

2.A. How do they affect the ability to drive?

We will primarily consider the risk arising from:

- ***Perceptual disturbances***
- ***Increased reaction time***
- ***Attention deficit***
- ***Adverse effects of medication***

Our hearing allows us to receive information related to driving. This information comes from both outside the vehicle: stimuli in the form of sounds emitted by other vehicles (horns, engine revs, sirens from different emergency vehicles, etc.), sound stimuli emitted by elements included in or close to the road (roadworks, cranes, etc.), and those emitted by the vehicle itself. In this case, we are referring to noises emitted by the engine, conversations or warnings from passengers, the radio, music, etc.

In this way, the loss of hearing acuity isolates us from our surroundings while driving, causing us to miss important information needed to prevent dangerous situations. In short, the sense of hearing is a warning system while driving, and its impairment therefore requires a higher level of attention.

Vertigo or balance disorders can be a serious problem for driving. Vertigo (such as a sensation of movement of the surroundings, especially of a rotating nature) is caused by a labyrinthine disorder. It usually has an acute onset that makes driving impossible, at least until compensatory mechanisms are established (at the central level).

Vertigo and, in general, balance disorders can affect attention span, cause perceptual and cognitive deficits, all of which alter psychomotor response and reaction times.

Therefore, in relation to vertigo, we will pay special attention to cases of chronic or prolonged processes of central origin (vascular, multiple sclerosis, psychogenic, etc.) or vestibular origin (Ménière's disease, labyrinthitis, vestibular neuronitis, etc.).

2.B. Effects of treatment on driving

Hearing aids, including hearing aids and cochlear implants, improve acoustic perception while driving. They allow drivers to receive acoustic signals and warnings from both the vehicle itself and the external traffic

environment. Acoustic signals allow drivers to direct their attention to the source of the signal. Vehicle acoustic signals and warnings can be combined with light signals to improve the perception of the warning.

Hearing aids should be checked regularly to avoid discrepancies between the progression of the hearing loss and its adequate correction.

In the case of cochlear implants, the following should be considered:

- Implants in adults offer variable results.
- They are implanted in cases of moderate to severe sensorineural hearing loss and in cases of hearing loss with residual hearing in low frequencies but with significant loss in mid and high frequencies.
- An implant in one ear may be combined with a hearing aid in the other ear.
- Implant for unilateral deafness. In all cases of cochlear implants, as with hearing aids, the mixed hearing loss index will be obtained from the results of the audiological report following free-field audiometry.

The variety of causes of balance disorders means that we must consider the side effects of treatment in each case and the risk of using a vehicle in such circumstances.

Some medications for vertigo, such as cinnarizine and flunarizine, can have a significant effect on the ability to drive.

2.C. General regulatory reference on hearing and balance impairments

Section 2 of Annex IV of Royal Decree 818/2009 of 8 May on the mental and physical aptitudes required to obtain or renew a driving licence establishes two levels of mixed hearing loss index (MHL) with or without a hearing aid for the two groups of licences. In the case of Group 1, the MHL must not exceed 45% and in the case of Group 2, it must not exceed 35%. For Group 1, compensation for hearing loss is permitted by means of adapted rear-view mirrors that widen the field of vision.

How should we interpret this?

The MHL is an index that is applied exclusively in this regulation (when RD 1467/82 was published, determining illnesses and impairments, in Annex I, point 2 Hearing Acuity, it refers to the mixed hearing loss index, a term that at that time was only considered in this regulation). It is an indicator of combined hearing acuity in both ears, with greater influence being given to the better ear. Thus, once the loss for each ear has been calculated (arithmetic mean obtained from the four frequencies: 500, 1,000, 2,000 and 4,000 Hz), the best is multiplied by seven, the worst is added and the result is divided by eight. This index is justified by checking the acoustic conditions surrounding the driver, both inside the vehicle and outside. Simply put, there is no stereophony, so hearing loss or cofosis in one ear has less value than in other areas of daily life. On the one hand, the closed vehicle does not allow us to know or locate the source of the sound, or rather, its location. In addition, buildings and other rigid structures act as screens and reflect the sound waves, further complicating the acoustic conditions inside the vehicle. In the opinion of experts, the loss in dB can be accepted, in this case, directly as a percentage.

When there is a sensory deficit, compensatory mechanisms are applied based on enhancing the capacity of other sensory areas. In this case, visual capacity is enhanced through the use of side-view mirrors and a panoramic interior mirror, thereby increasing the field of vision of drivers with hearing impairments.

When it comes to vertigo, we should consider any condition that causes vertigo, instability or balance problems as disabling. We therefore distinguish between:

- **Acute unilateral vestibulopathy (labyrinthitis, neuritis):** in this case, the patient must refrain from driving until the acute symptoms have resolved. The person suffering from this condition may drive as long as it does not occur during horizontal movements.
- **Recurrent unilateral vestibulopathy (Ménière's disease):** at the slightest sign of onset, the patient must stop driving until the treatment resolves the crisis and the patient is free of symptoms. If symptoms appear without warning (Tumarkin otolith crises or drop attacks), driving must be prohibited until the condition is under control (approximate protection period: six months).
- **Chronic bilateral vestibulopathy**: many of these patients are safe drivers as they do not experience episodes of vertigo. In cases of complete functional vestibulopathy, the risk occurs when driving at night and on uneven roads.
- **Benign paroxysmal positional vertigo**: in these cases, there is usually no vertigo when standing upright, so they do not usually affect driving ability.

2.1. Hearing loss

2.1.C. Regulatory reference on hearing loss

Group 1 drivers (non-professional)

When the driver suffers from hearing loss that gives rise to a mixed hearing loss index (MHL) with or without a hearing aid of more than 45%, they must have rear-view mirrors on both sides of the vehicle and a panoramic rear-view mirror. The hearing deficit may be compensated for by widening the field of vision using adapted rear-view mirrors.

Group 2 drivers (professional)

Group 2 drivers with hearing loss whose mixed hearing loss index (MHL) with or without a hearing aid is greater than 35% will not be able to obtain or renew their driving licence.

2.1.D. Advice for drivers with hearing loss

Hearing loss due to 'acoustic trauma' should be prevented by wearing ear defenders in noisy work environments and following the recommendations of occupational health services.

If you suffer from hearing loss and driving is part of your job, always check the position and orientation of the rear-view mirrors in the vehicle you use to improve your field of vision and compensate for your hearing loss.

Avoid driving with the radio/music turned up loud, as this will make it difficult to hear sounds from both inside and outside the vehicle.

If you use a hearing aid, have it checked and serviced regularly to prevent it from malfunctioning or causing sound distortion.

If you change your hearing aid (different model), avoid driving until you have checked that you are used to the new model.

After ear surgery, you should avoid driving for at least three to four weeks. It is particularly

important for professional drivers (group 2) with hearing problems to be aware of the existence

of audio-visual conversion aids that provide visual warnings of external and internal events in the vehicle. Written communication systems for emergency situations are also important.

Do not drink alcohol if you are going to drive.

If you are on sick leave and work as a driver or your job requires you to drive, you must know whether you could get into legal trouble if you drive while on sick leave.

2.2. Vertigo

2.2.C. Regulatory reference on vertigo

Group 1 drivers (non-professional) and Group 2 drivers (professional)

There must be no permanent, progressive or severe balance disorders (vertigo, instability, vertigo, light-headedness), whether otological or otherwise.

The section on vertigo in Annex IV of the Spanish Highway Code is included in the neurological system as it covers other causes of vertigo and other forms of loss of balance.

2.2.D. Advice for drivers with vertigo

I n the event of an episode (Ménière's disease) or acute manifestation of vertigo or instability as a symptom of a medical condition, you must not drive until the prescribed treatment has eliminated the symptoms of vertigo.

If you are a professional driver and suffer from recurrent vertigo (which comes and goes), you should avoid driving for at least six months without an episode.

Vertigo is a symptom that temporarily incapacitates you from working as a driver, both because of the vertigo itself and because of the side effects of its treatment.

If you are undergoing drug treatment for vertigo, you should be aware that the drugs (anti-vertigo medication) may affect your ability to drive. If you have any doubts, consult your doctor and inform them that you are a regular driver.

Do not drink alcohol if you are going to drive.

If you are on sick leave and your profession is driving or requires driving, you should find out whether you would incur any legal trouble by driving during the period of sick leave.

UNIT 3. VISUAL IMPAIRMENTS

The frequency is variable. Symptoms vary depending on the degree of involvement and may cause impaired ability to drive due to visual perception disorders.

3.1. Visual acuity
3.2. Visual field
3.3. Aphakia
3.4. Contrast sensitivity
3.5. Ocular motility

3.A. How do they affect the ability to drive?

Drivers receive 80% of the information they need to drive through their eyesight. Any impairment in visual function prevents the proper perception of stimuli, interfering with other fundamental driving skills such as cognitive processing, decision-making and psychomotor response, which will be impaired.

Essentially, we will take into account the risk arising from:

- ***Alterations in visual perception***
- ***Increased reaction time***
- ***Undesirable effects of treatment***
- ***Age-related comorbidity***

Assessing a driver's visual ability is complex and involves evaluating different functions of the sense of sight.

3.1.A. Visual acuity. In general, static visual acuity is assessed, even though dynamic visual acuity is more sensitive for driving (more than half of subjects with normal static visual acuity perform below normal on kinetic tests). Refractive errors, the presence of cataracts, macular degeneration, and surgical correction (aphakia, refractive surgery or anterior pole surgery) are factors that can alter visual acuity. In the case of monocular vision, the brain needs time to adapt to the new situation without stereoscopy.

3.2.A. Visual field. This is the area of the traffic environment that we can perceive with our eyes in the primary position (looking straight ahead). The most common causes of visual field impairment are glaucoma, cataracts and retinal disorders associated with the ageing process. These, in conditions of poor visibility (low light, fog, rain, etc.) or fatigue, are a major road safety risk factor. The 'panoramic field' while driving can be expanded to almost 360° by moving the eyes, turning the neck or the trunk. Small scotomas in the periphery may not affect driving, but a scotoma in the central field (fovea) can cause a significant functional deficit for safety.

3.3.A. Aphakia. Currently, intraocular lenses after cataract surgery are present in a significant number of drivers. In general, they do not usually cause problems that affect visual ability to drive, provided they are checked regularly by an ophthalmologist. The probable opacity of the posterior capsule should also be taken into account, as this is a common complication in the first year after surgery and is treated by YAG laser capsulotomy.

3.4.A. Contrast sensitivity. Glare recovery is a good indicator for measuring this. It can be a risk factor in changes in mesopic (intermediate light), scotopic (night) and photopic (daytime) vision. Damage caused by cataracts, glaucoma and macular degeneration can cause contrast sensitivity deficiency, and there is a correlation between contrast sensitivity deficiency and age.

3.5.A. Ocular motility. This allows us to direct our gaze towards what catches our attention. If this is not coordinated and symmetrical, defects in image fusion may be found, with alteration of the visual field and depth perception (stereopsis), with poor perception of distances. Strabismus and nystagmus can be causes of this functional loss, while double vision (diplopia) is a road safety risk when it appears in the central field.

Other aspects to consider in relation to visual ability are:

Retinal function. This can be affected by systemic diseases such as diabetes, high blood pressure, etc. High myopia (thin, atrophic retinas) and macular degeneration (intraocular hypertension) can cause progressive deterioration of visual ability, affecting the definition of shapes and colours and reducing the visual field and contrast sensitivity.

Discromatopsia. Although not included in the regulations, we must bear in mind that this can be caused by diseases of the retina, the optic nerve, cataracts, glaucoma, macular degeneration, etc. It can also appear in chronic users of alcohol, tobacco or drugs.

Nerve connection functionality. This allows visual stimuli to be transmitted for processing. Therefore, different neurological disorders can cause visual impairment.

3.B. Effects of treatment on driving

Consider the side effects of drugs on vision, whether administered topically or systemically.

After an eye examination in which mydriatic eye drops have been administered to examine the retina, visual ability may be affected until the mydriatic effect wears off and the pupil regains its function.

After laser treatments used in refractive surgery and capsulotomies, the preventive periods without driving prescribed in the regulations must be observed. In laser treatments applied to retinal diseases, we must advise against driving for 48 hours.

Orthokeratology can compensate for refractive errors, provided that certain criteria are met: compliance with treatment (lenses must be worn every night); mild refractive errors; trial period prior to driving.

3.C. Regulatory reference on visual capacity

Intraocular lenses should not be considered corrective lenses. Monocular vision is defined as visual acuity of less than 0.10 in one eye, with or without corrective lenses, due to anatomical or functional loss of any aetiology.

Group 1 drivers (non-professional)

3.1.C. Visual acuity. Binocular visual acuity of at least 0.5 must be achieved, if necessary with corrective lenses. Monocular vision is not acceptable.

3.2.C. Visual field. If vision is binocular, the binocular field must be normal. In the binocular examination, the central visual field must not present absolute scotomas at corresponding points in both eyes or significant relative scotomas in retinal sensitivity.

If vision is monocular, the monocular visual field must be normal. The central visual field must not show absolute scotomas or significant relative scotomas in retinal sensitivity.

As described in the medical-psychological examination protocol, the horizontal field must be 120° with integrity in the central 20°.

3.3.C. Aphakia and pseudo-aphakia. Driving will be permitted one month after stabilisation, if the values for visual acuity and visual field are achieved.

3.4.C. Contrast sensitivity. There should be no significant alterations in the ability to recover from glare or alterations in mesopic vision.

3.5.C. Ocular motility. Diplopia in the central 20° of the visual field is not permitted. In all other cases, the diplopia must have been present for more than 6 months and be duly justified by an ophthalmologist's report.

Group 2 drivers (professional)

3.1.C. Visual acuity. With or without optical correction, visual acuity must be at least 0.8 and at least 0.1 for the eye with the best acuity and the worst acuity, respectively. If glasses are required, their power must not exceed + 8 dioptres. Monocular vision is not permitted.

3.2.C. Visual field. Normal binocular visual field must be present. After examination of each of the monocular fields, there must be no significant reductions in any of their meridians. In the monocular examination, the presence of absolute scotomas or significant relative scotomas in retinal sensitivity is not permitted.

As described in the medical-psychological examination protocol, the horizontal field must be 160° with integrity of the central 30°.

3.3.C. Aphakia and pseudo-aphakia. Driving is permitted two months after stabilisation, if the specified visual acuity and visual field values are achieved.

3.4.C. Contrast sensitivity. There must be no significant alterations in the ability to recover from glare or alterations in mesopic vision.

3.5.C. Ocular motility. Diplopia is not permitted. Nystagmus is not permitted when it prevents the visual capacity levels indicated in the other vision sections for group 2 from being achieved. Strabismus, if it affects other sections of visual capacity, must be assessed by an ophthalmologist, with particular attention to visual fatigue, the presence of diplopia, stereopsis status and evolution.

3.D. General advice for drivers with visual impairments

Always wear the prescribed eyewear that is up to date and appropriate for your refractive error.

Adapt your driving habits to changes in your health; driving in adverse conditions will require extra attention and concentration.

Avoid sudden manoeuvres and risky overtaking.

Avoid driving at night, at dawn and at dusk.

If you require treatment with eye drops, read the road safety warnings on the package leaflet.

If, after an eye examination, you experience blurred vision due to the eye drops used to examine the back of your eye, avoid driving until your normal vision has returned.

If you have planned or undergone any eye surgery (correction of myopia, hyperopia, astigmatism, cataracts, glaucoma, strabismus, retinal detachment, etc.), your driving conditions may have changed, so you should check your current situation at a Driver Assessment Centre (DAC). Regardless of whether your licence is valid or has expired, it may be necessary to modify the conditions of your driving licence.

If you have lost the sight in one eye, you must go to a DAC, as you must stop driving for at least six months (the minimum time needed to adapt to the new situation).

If you are diabetic, suffer from high blood pressure or glaucoma, or have been diagnosed with any degenerative retinal disease, you should be aware that your ability to drive may be impaired. If in doubt, consult your ophthalmologist or DAC.

When driving, you should avoid: bangs that are too long, caps/hats that partially cover your eyes, and glasses with frames that may reduce your field of vision.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

3.1.D. Advice for drivers with visual acuity impairments

Always wear the prescribed eyewear that is up to date and appropriate for your refractive error.

If you require vision correction for both near and far vision and use bifocal or progressive lenses, make sure you are well adjusted to this type of lens before using them for driving, as they may cause perception errors and momentary disorientation. Progressive lenses for near vision problems will allow you to read the information on the dashboard clearly.

Avoid driving at night, at dawn and at dusk.

If you wear prescription sunglasses, brown filters are recommended for short-sighted people and for astigmatism, while green is recommended for long-sighted people.

If, after an eye test, you have blurred vision due to the eye drops used to examine the back of

your eye, avoid driving until your normal vision has returned.

If you have planned or undergone any eye surgery (correction of myopia, hyperopia, astigmatism, cataracts, glaucoma, strabismus, retinal detachment, etc.), your driving conditions may have changed, so you should check your situation at a Driver Assessment Centre (DAC). Regardless of whether your licence is valid or has expired, it may be necessary to modify the conditions of your driving licence.

If you do not have adequate visual acuity in each eye separately, temporarily and/or must cover one eye with a patch due to a temporary situation (due to injury, surgery, treatment with eye drops, etc.), avoid driving for the duration of this process.

Remember that orthokeratology is only effective if applied regularly.

Increase your safety distance whenever you notice a loss of visual acuity due to tiredness, sleepiness, watery eyes, etc.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

3.2.D. Advice for drivers with visual field impairments

Avoid sudden manoeuvres and risky overtaking.

Avoid driving at night, at dawn and at dusk.

If you have lost vision in one eye, you must go to a Driver Assessment Centre (DAC), as you will need to stop driving for at least six months (the minimum time required to adapt to the new situation).

If you are diabetic, suffer from high blood pressure or glaucoma, or have been diagnosed with any degenerative retinal disease, you should be aware that your ability to drive may be impaired. Consult an expert about vision assistance systems for driving (blind spot, rear view cameras).

Before setting off, adjust your mirrors: the central interior mirror should be centred with the rear window, so that you only need to move your eyes and there are no objects obstructing your view. The left and right mirrors should be adjusted so that you can no longer see the bodywork (this way, when overtaking, you will first see the vehicle in the central mirror and then in the left mirror).

Do not drive if you have a temporary patch over one eye due to injury, surgery or treatment, as adapting to monocular vision requires time and preventive measures when driving.

If you are a professional driver, you are not allowed to drive with vision in only one eye.

Increase your safety distance to allow for more reaction time.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

Try to drive on familiar routes, avoiding rush hour and complicated journeys (with heavy traffic, multiple entrances and exits, etc.) and adverse weather conditions (fog, snow, rain, storms, etc.).

3.3.D. Advice for drivers with aphakia

Observe the visual acuity adaptation periods specified in the regulations.

If you require optical correction after cataract surgery, always wear the prescribed eyewear that is up to date.

Intraocular lens implants may be associated with increased glare. Consult your optician about the most suitable lenses to prevent this.

Adapt your driving habits to changes in your health; driving in adverse conditions will require extra attention and concentration.

Have regular check-ups with your ophthalmologist to check the transparency and position of the intraocular lens.

If you have had surgery on one eye and are awaiting surgery on the other, consider the need to drive during this adjustment period.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

3.4.D. Advice for drivers with contrast sensitivity impairments

If you have been prescribed eyewear, remember to update the prescription of your glasses/contact lenses regularly to adjust them to any changes in your vision.

Avoid driving at night, at dawn and at dusk. Be extra vigilant in tunnels. If you wear sunglasses, remember to remove them.

In foggy conditions, orange or yellow lenses are recommended to improve vision.

Adapt your driving habits to changes in your health; driving in adverse conditions will require extra attention and concentration.

If you require eye drops, read the road safety warnings on the package leaflet.

If, after an eye examination, you experience blurred vision due to the eye drops used to examine the back of your eye, avoid driving until your normal vision has returned.

If you are diabetic, suffer from high blood pressure or glaucoma, or have been diagnosed with any degenerative eye disease, you should be aware that your ability to drive may be impaired.

Increase the safety distance.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

3.5.D. Advice for drivers with ocular motility impairments

You must not drive if you have double vision. See your ophthalmologist and wait until your vision returns to normal.

If you have been prescribed prism correction, remember to update the prescription for your glasses/contact lenses regularly to adjust them to any changes in your vision.

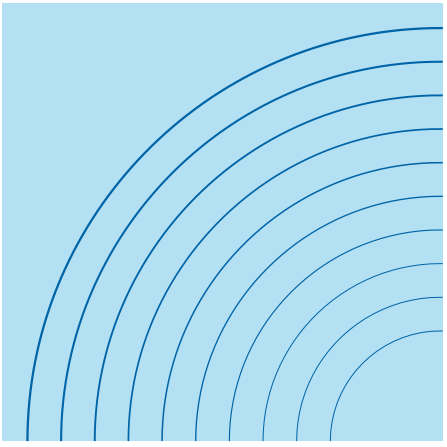
Adapt your driving habits to changes in your health; driving in adverse conditions will require extra attention and concentration.

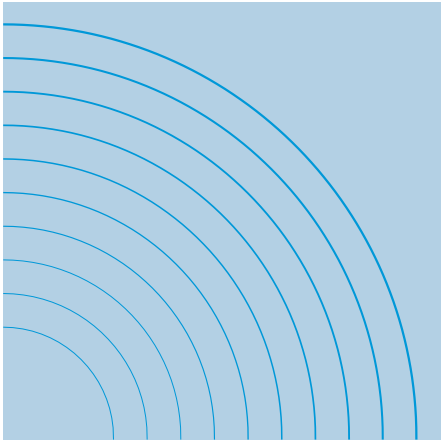
Avoid sudden manoeuvres and risky overtaking.

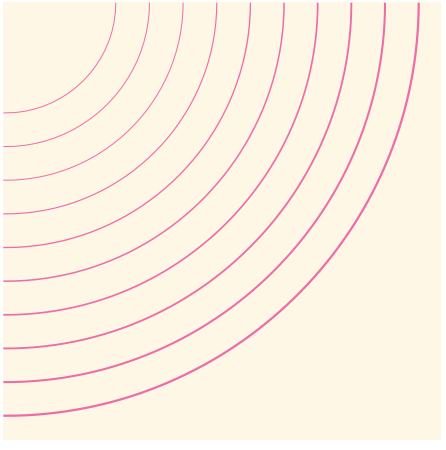
Check the position of the rear-view mirrors on each side and the interior panoramic mirror each time you use the vehicle, as they can improve your side vision.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.







UNIT 4. MOTOR SYSTEM IMPAIRMENTS: DISABILITY-HEIGHT

Motor system impairments can be caused by various pathologies of the skeletal, muscular, nervous and sensory systems. They can be the result of cardiovascular (stroke) and metabolic (diabetes) complications, among others.

They may be genetic or acquired.
They may have a sudden traumatic onset, causing an anatomical impairment, or be caused by stroke, resulting in functional impairment.
Their progression varies (unchanged, sluggish, progressive, slow or rapid).

Symptoms vary depending on the degree of impairment and may cause a deterioration in the ability to drive due to imprecise motor responses in terms of time and space.

Reaction time, which is the time between the perception of risk and the initiation of preventive/evasive action, is influenced by: sensory and motor impairments; fatigue; consumption of drugs, alcohol and substances; and other distractions (such as road conditions, vehicle conditions and other weather factors) which, if unfavourable, will add to the difficulty.

4.A. How do they affect the ability to drive?

We will primarily consider the risk arising from:

- *The inability or difficulty of performing movements.*
- *Increased reaction time.*
- *Impaired coordination.*
- *The presence of tremors.*
- *Decreased muscle strength.*
- *Undesirable effects of treatment.*

• Total or partial impairments of the upper limbs are more disabling for driving than those located in the lower limbs. This is because they require more complex adaptations.

• Functional impairments of the cervical and dorsal spine will limit the range of vision, affecting safe manoeuvrability. Lumbar impairments compromise the maintenance of a seated posture.

• Limb impairments are more disabling the closer the affected segment is, decreasing from shoulder to hand and from hip to foot.

• In our context, impairments of the right side of the body are more disabling than those of the left, both upper and lower, due to the location of the steering wheel and other controls, which are designed for driving on the right.

• Neuromuscular diseases that occur in flare-ups and remissions may not affect or minimally affect driving in the early stages and between flare-ups, but may be disabling when active, presenting after-effects or deformities.

• Extreme heights, <1.50 or >2 m, require seat and belt adjustments.

Factors influencing the impairment:

- *Nature of the impairment (causegiving ofthe deficit: congenital, traumatic, etc.*
- *Partial or total loss and/or functional status of preserved anatomical structures.*
- *Extent and location of the impairment.*
- *Time of onset, course and evolution of the impairment.*
- *Accompanying symptoms.*
- *Associated diseases (general condition).*
- *Side effects of treatment, both prescribed and self-medicated in specific situations (painkillers, anti-inflammatories, etc.).*

Factors influencing disability:

- *Compensations (modifications of movements that replace others that are impaired).*
- *Use and tolerance of prostheses and orthoses.*
- *Motivation, functional re-education, acceptance/habituation to impairment.*
- *Resistance to fatigue.*
- *Age.*
- *Socio-cultural and economic resources.*
- *Possibility of vehicle adaptations.*

4.B. Effects of treatment on driving

Analgesics, anti-inflammatories, muscle relaxants, etc., in general, carry a road safety warning (pictogram on the medicine box), as they can cause drowsiness and slow reaction times.

If it is necessary or advisable to use orthoses, prostheses, etc., a Driver Assessment Centre (DAC) should be consulted, as driving ability must be checked and, if necessary, the conditions of the licence modified.

4.C. Regulatory reference on motor system impairments (disability, height)

There must be no impairment that prevents normal seated position or effective operation of the vehicle's controls and devices, or that requires the use of atypical or tiring positions, or conditions or abnormalities that require adaptations, restrictions or other limitations on persons, vehicles or traffic.

There must be no progressive conditions or abnormalities. No sizes that result in a driving position incompatible with the safe handling of the vehicle or with the driver's correct visibility are permitted.

Group 1 drivers (non-professional)

Any adaptations, restrictions or other limitations imposed on persons, vehicles or traffic shall be determined in accordance with the disabilities of the person concerned, as duly recorded in the mental and physical aptitude report and assessed in the corresponding static and dynamic tests.

Progressive conditions or abnormalities, when they do not prevent the granting or renewal of the licence or the periodic examinations to be carried out are for a period shorter than the normal period of validity of the licence, the period of validity shall be determined on medical grounds.

When height prevents a safe driving position or does not allow adequate visibility for the driver, any adaptations, restrictions or limitations imposed shall be determined according to technical criteria and in accordance with medical opinion, with the necessary assessment, where appropriate, in the corresponding static or dynamic tests.

Group 2 drivers (professional)

Exceptionally, adaptations to vehicles and persons will be permitted with a favourable report from the competent medical authority, following the protocol established by the Autonomous Central Traffic Authority and with the appropriate assessment, where applicable, in the corresponding static or dynamic tests. Due consideration shall be given to the additional risks or dangers associated with driving vehicles arising from the disabilities included in this group (R.D. 971/2020, of 11 November)

There must be no progressive conditions or abnormalities.

Sizes that result in a driving position incompatible with the safe handling of the vehicle or with the driver's correct visibility are not permitted.

4.D. Advice for drivers with motor impairments

If you have difficulty moving around at Driver Assessment Centres (DAC), they can advise you on possible vehicle adaptations to make driving easier.

You must adapt your driving habits to your functional abilities, avoiding feeling tired and uncomfortable.

You must understand the advisability and necessity of complying with the limitations and/or restrictions set out in your driving licence.

If your mobility is affected by a chronic condition that occurs in episodes, with flare-ups, during which you are likely to need treatment and modify your lifestyle, you should consider changing your driving habits until the flare-up subsides. There may even be circumstances in which you are not advised to drive.

If your motor impairment is progressive, you must understand that the period of validity may be shortened in order to adjust your abilities to the changing impairments.

If you have a disease that affects your general condition and has an impact on different organs and systems involving mobility, you must adjust your driving habits to your changing abilities.

If the motor impairment is the result of a stroke, consult a DAC before driving again.

Avoid driving for more than 1 hour at a time.

Keep the vehicle in good condition (temperature, noise, etc.) to avoid fatigue and discomfort that could cause distractions

Wear shoes that fit well to prevent slipping, which could cause you to lose control of the clutch, accelerator and brakes.

Plan your trips, try to travel with someone else and avoid driving at night. Maintain your usual rest, meal and medication schedules.

Try to drive on familiar routes, avoiding rush hour, complicated journeys (with heavy traffic, multiple entrances and exits) and adverse weather conditions (fog, snow, rain, storms, wind, etc.).

It is not advisable to establish your place of residence in an isolated area with access problems subject to adverse environmental circumstances. And with the need for compulsory travel to meet needs: work, family, health, etc.

It is not advisable to use the vehicle for work purposes or other essential travel where you have to keep to a schedule or have an added responsibility.

If you wear orthotics or prosthetics to stabilise, supplement or replace damaged joints, they must be approved by the Ministry of Health and must be checked to ensure that they meet functionality criteria.

When changing orthotics or prosthetics due to wear and tear or a change in material, modification of the stump or replacement due to a change in size, you must allow for a period of adaptation before driving to avoid discomfort that could interfere with the safe operation of the vehicle.

The treatments prescribed to relieve pain and improve mobility and quality of life in bone and muscle disorders can have side effects that affect driving. They are also often supplemented by treatments to alleviate the neurological and psychological components that accompany this group of diseases, with the consequent accumulation of undesirable effects on driving.

If you need painkillers, anti-inflammatories and/or muscle relaxants, you should be aware of the road safety warning on the medicine packaging, which is indicated by a pictogram (a red triangle with a black car inside), and carefully read the section on driving risks in the package leaflet.

Alcohol may trigger the onset of unwanted side effects if consumed at the same time as your prescribed medication.

In the event of osteoarticular surgery (with or without immobilisation), you must comply with preventive periods without driving until you regain full functionality.

In the event of an anatomical or functional impairment that compromises the manoeuvrability of the vehicle, you must go to a DAC to begin the process of obtaining or modifying your driving licence. The DAC will assess the impairment and prescribe the new conditions for the licence and the vehicle.

If the driving conditions are modified with vehicle adaptations, remember that you must adapt to the new driving conditions.

The Provincial Traffic Department will assess, through a practical test, whether the adaptations prescribed by the DAC are appropriate for your needs. You can practise driving the vehicle with

adaptations at a driving school, where you will train with an adapted driving school vehicle. After passing the practical test, the vehicle can be adapted to the driver's new needs by going to a mechanic or car dealer that offers adaptations approved by the Ministry of Industry.

Adapting the vehicle should never be the first step, as practical checks by Traffic Department staff may alter the adaptation requirements.

Professional drivers with Group 2 licences:

- *Must be able to access the cab, maintain the seat in an upright position and exercise good control of the controls with their upper and lower limbs, with the ability to actively steer the vehicle with the necessary force in both directions, using both hands to maintain continuous control of the vehicle in all circumstances, including unexpected and emergency situations.*

- *Control of the steering with both arms is considered a minimum requirement.*

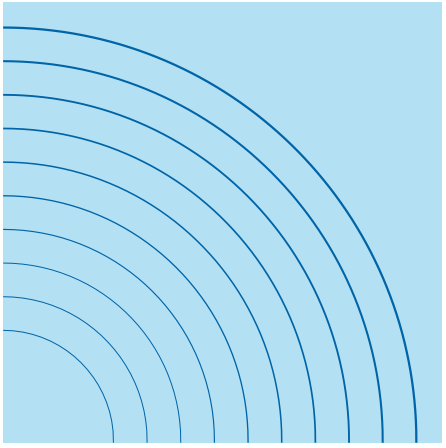
- *In the anatomical absence of a lower limb, the use of a prosthesis is considered necessary to aid stability in the seated position and access to the cab.*

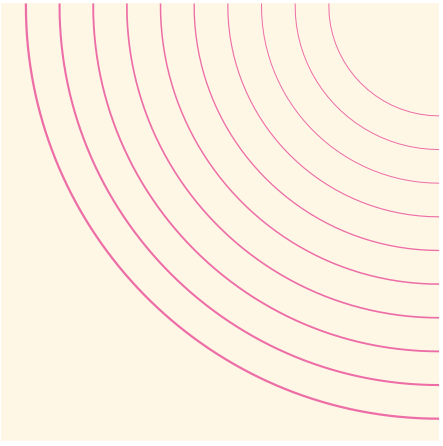
- *The anatomical absence of both limbs at the same time is not compatible with the exceptional characteristics of allowing Group 2 licences to be held.*

Drivers with anatomical absence of both lower limbs at the same time are advised not to use motorcycles, even if they use prostheses.

Motorcyclists with total or partial loss of a limb are advised to use prostheses and three-wheeled motorcycles to achieve minimum stability in high-risk situations.

If you are on sick leave and your profession is driving or requires driving, you should find out whether you would incur any legal problems by driving while on sick leave.





UNIT 5. SUBSTANCE USE: Drugs of abuse and drug addiction

The various drugs of abuse are usually classified into three broad groups according to their predominant effect on the central nervous system. All of them interfere with the ability to drive properly, although they sometimes do so through different mechanisms.

5.A. How do they affect the ability to drive?

Central nervous system depressants are substances whose effects are due to the depression or inhibition they cause in the functions of the central nervous system. The subjective effects predominate, such as relaxation, well-being, etc. Objectively, there is a decrease in alertness (sedation, drowsiness, etc.), an increase in reaction time and, in general, a deterioration in psychomotor performance.

Furthermore, if they are taken together, their sedative effect is enhanced. This is particularly important in the case of benzodiazepines, barbiturates and alcohol intake.

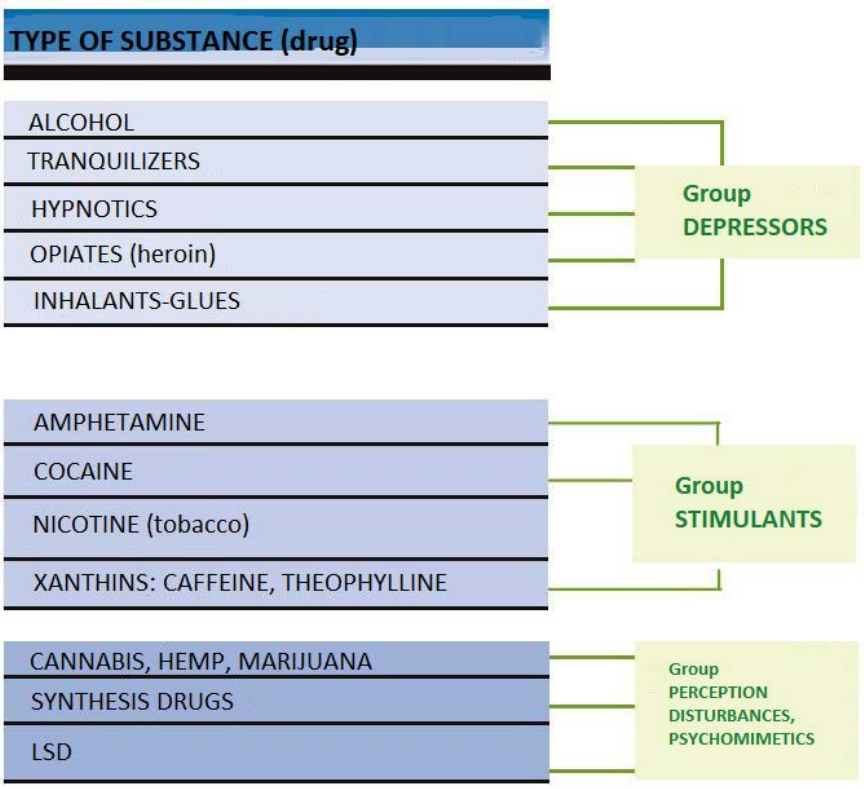
Central nervous system stimulants. These substances are characterised by their predominantly stimulating effects on the central nervous system. People who consume them often report subjective effects such as euphoria, stimulation, irritability, etc. Objectively, these users experience cardiac stimulation (tachycardia), high blood pressure, insomnia, etc. The stimulating power of different substances varies greatly. The most powerful stimulants are amphetamine, its analogues (methamphetamine) and cocaine.

A fundamental aspect of these substances is their effect on risk perception and the adoption of risky behaviours. Potent stimulants (amphetamines, cocaine and synthetic drugs at medium to high doses) can cause people to perceive risk inadequately, leading them to engage in dangerous behaviours and, consequently, to have a higher accident rate in traffic.

Perception-altering, psychomimetic or hallucinogenic drugs. The common feature of all these drugs is that they cause an alteration in the perception of stimuli. In addition to this disturbing effect, the various substances may have varying degrees of depressant or stimulant effects on the central nervous system. There are major differences between the substances in this group, particularly with regard to the degree of disturbance they cause to perception.

Most (cannabis/hemp and synthetic drugs) tend to cause mild alterations or distortions of perception (e.g., the sensation that time is slowing down or that one is more sensitive to touch, etc.). However, at high doses, the effect on perception can be more pronounced. Very few substances, such as LSD, actually cause hallucinations. Anaesthetics such as ketamine and phencyclidine, which have a dissociative depressant effect on the CNS, cause euphoria and a feeling of depersonalisation at low doses.

In terms of road safety, the main problem within this group is cannabis and synthetic drugs. In both cases, the central effect of the substances is to alter perception. Driving requires adequate perception and interpretation of the stimuli received by the driver. In the case of cannabis, it also has depressant effects, while synthetic drugs have a stimulating effect.



5.B. Effects of treatment on driving

Medicines used in drug withdrawal programmes, such as anxiolytics, sedatives, antidepressants and antipsychotics, have significant side effects on driving, all of which fall into categories 2 (moderate) and 3 (severe) side effects on the ability to drive, especially at the start of treatment.

The categorisation of the side effects of drugs can be consulted at:
https://www.aemps.gob.es/industria/etiquetado/conduccion/docs/Medicamentos_conduccion_DocConsenso.pdf

The DRUID project's WP-4 working group reviewed certain groups of drugs according to their influence on the ability to drive and proposed a classification of these drugs into four categories:

- *Category 0 (no effect on the ability to drive).*
- *Category I (mild influence on the ability to drive).*
- *Category II (moderate influence on the ability to drive).*
- *Category III (very marked influence on the ability to drive).*

5.C. Regulatory reference on substance use

Spanish law prohibits driving a vehicle when drugs or narcotics have been taken or under the influence of medicines or any other substance that alters the physical or mental state required to drive safely.

Law 6/2014, which amends the Law on Traffic, Motor Vehicles and Road Safety, establishes administrative penalties for the mere presence of drugs in the driver's body.

Substances used on medical prescription and for therapeutic purposes are excluded, provided that they do not affect the driver's ability to drive.

The detection of drug use in drivers is carried out using saliva drug detection devices. The mere presence of drugs in saliva gives rise to an administrative penalty, while in cases where the influence of drugs on driving is detected, the case is referred directly to the criminal courts, as provided for in Article 379.2 of the Criminal Code.

Saliva drug detection devices have been proven to be legally safe, non-intrusive for drivers and viable from a police point of view.

Violations of this rule are considered very serious.

Tests to detect the presence of drugs in the body are carried out on a saliva sample using an authorised device on site and a subsequent analysis of a sufficient quantity of saliva.

However, where there are justified reasons preventing these tests from being carried out, a medical examination of the person concerned or the clinical tests deemed most appropriate by the doctors at the health centre to which they are transferred may be ordered.

For the purposes of verification, at the request of the person concerned, the tests for the detection of alcohol or drugs may be repeated, preferably consisting of blood tests, except in duly justified exceptional cases. When the verification test is positive, the cost shall be borne by the person concerned.

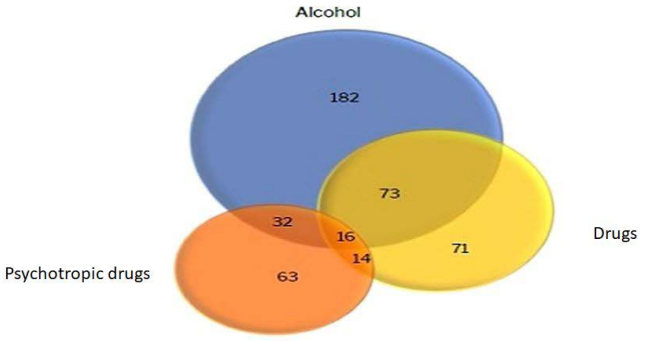
Healthcare professionals are obliged, in all cases, to report the results of these tests to the Head of Traffic in the province where the offence was committed or, where appropriate, to the competent bodies responsible for imposing penalties in the autonomous communities that have been transferred responsibility for traffic and motor vehicle circulation, or to the competent municipal authorities.

With regard to the deduction of points, Law 18/2021 of 20 December maintains the loss of 6 points for driving with drugs in the body and for failing to comply with the obligation to undergo tests to detect alcohol or the presence of drugs in the body.

The figure taken from the report on toxicological findings in fatal traffic accidents in 2022 shows that a significant percentage of drivers who consume alcohol do not consume only alcohol or a single substance, but may consume drugs or psychotropic drugs at the same time as alcohol, a form of multiple consumption that can lead to unpredictable behaviour.

51.4% of drivers with positive toxicology results were driving a car and 33% were driving a motorcycle or moped.

Chart 17: POSITIVE CONDUCTORS (n - 451). CLASSIFICATION OF RESULTS ACCORDING TO THE TYPE AND/OR COMBINATION OF SUBSTANCES DETECTED



Report on fatalities in traffic accidents in 2022

Group 1 drivers (non-professional) and Group 2 drivers (professional)

Current regulations, both at European (EEC) and national level (section 11, Substance-related disorders, of Annex IV of Royal Decree 818/2009 of 8 May, on the mental and physical aptitudes required to obtain or renew a driving licence) establishes that drivers who have problems related to drug use (abuse, dependence, induced disorder, dementia, delirium, psychotic disorders) cannot be granted an extension of their driving licence as they do not have the appropriate aptitudes to drive safely.

It should be noted that the same heading includes drugs of abuse and medicines. In relation to drugs of abuse, in our opinion, the situation of abuse, dependence and induced disorder is applicable, and for medicines, that of habitual consumption.

The existence of abuse, dependence or disorder induced by drugs or medications is not permitted. Nor are cases of a history of abuse, dependence or induced disorders in which rehabilitation is not duly accredited.

However, the regulation states that: 'in cases where there is a history of dependence or abuse, a driving licence may be obtained provided that the situation of dependence or abuse has ceased after a proven period of abstinence and there are no irreversible after-effects that pose a risk to road safety. To ensure this, a favourable opinion from a psychiatrist, psychologist, or both, depending on the type of disorder, shall be required.'

It also establishes that 'in cases where there is a history of drug or medication abuse, with a favourable report for obtaining or extending the licence, the period of validity of the licence may be reduced at the discretion of the authorities.'

Reducing the period of validity of a driving licence can be an incentive to remain abstinent, as drivers must present a favourable report from the specialist treating them at the driver assessment centre when they go to renew their driving licence at subsequent assessments.

5.D. Advice for drivers with problems associated with drugs of abuse

Driving under the influence of drugs poses a major risk to road safety, both for the driver under the influence (after consumption) and for other road users.

Driving after consuming drugs is associated with an increased risk of traffic-related injuries.

There are no safe drugs of abuse when driving. Different drugs of abuse impair the ability to drive safely through different mechanisms.

People with problems related to drug use (abuse, dependence, induced disorder) may have impaired driving ability.

People with problems related to the use of drugs of abuse (dependence) should undergo appropriate medical and psychological treatment.

Spanish law prohibits driving a vehicle when drugs or narcotics, or any other substance that alters the physical or mental state required to drive safely, have been consumed.

Violations of this rule are considered very serious. Royal Legislative Decree 6/2015, of 30 October, and Law 18/2021, of 20 December, contain rules on the prohibition of driving and consuming substances.

During substance withdrawal treatment, patients should be advised not to drive for a reasonable period of time until stable follow-up checks have been carried out.

There are no safe drugs when driving. Different drugs impair the ability to drive safely through different mechanisms.

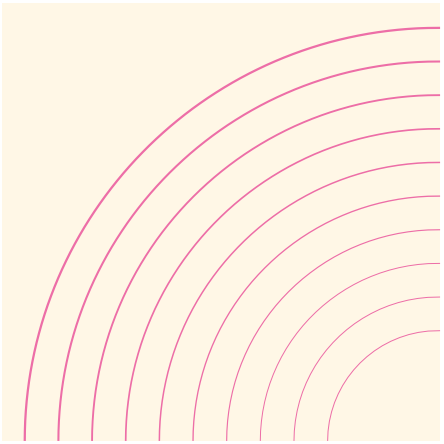
Alcohol and drugs negatively affect the ability to drive because they reduce coordination, increase reaction time and affect decision-making.

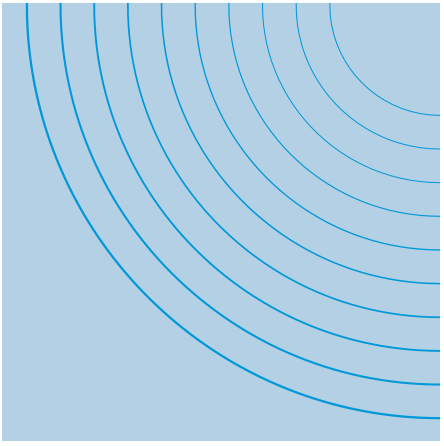
Cocaine, amphetamines, methamphetamines and other stimulants can cause aggression and reckless driving.

Tranquillisers, hypnotics, opiates (heroin) and inhalants (glue) are depressants that cause a decrease in alertness (sedation, drowsiness, etc.) and increase reaction times, with the consequent danger to driving.

Cannabis and synthetic drugs alter perception. Driving requires adequate perception and interpretation of stimuli.

If you are on sick leave and are a professional driver or your job requires you to drive, you must find out whether you are in breach of any legal obligations by driving during your sick leave.





UNIT 6. PREGNANCY AND DRIVING

6.A. How does it affect the ability to drive?

To ensure the survival of the foetus, it is necessary to ensure that the pregnant mother wears a seat belt from the outset.

In the event of any medical conditions affecting the pregnant woman, always consider the potential risk on the road.

6.B. Effects of treatment for pregnancy complications on driving.

Always on the advice of the gynaecologist, the benefits of treatment and the need to drive must be assessed.

6.C. Regulatory reference.

Group 1 drivers (non-professional) and group 2 drivers (professional)

Pregnancy as such does not pose a risk to driving and is therefore not included in Annex IV of the Regulation on Drivers. As it is a temporary situation, temporary interruption of driving should be considered when pregnancy complications make driving inadvisable.

In any case, medical conditions associated with or aggravated by pregnancy that may be considered road risk factors (gestational diabetes, high blood pressure, heart disease, haematological diseases, neurological diseases, psychiatric diseases, etc.) and the side effects of medication must be assessed, and the criteria set out in the regulations must be applied.

Royal Decree 965/2006, of 1 September, amending the Spanish Highway Code, approved by Royal Decree 1428/2003, of 21 November, establishes the mandatory use of seat belts and restraint devices and exemptions thereto, with the use of seat belts being mandatory during pregnancy, except for persons with a certificate of exemption for serious or disabling medical reasons. This certificate must be presented when requested by any traffic enforcement officer, must state its period of validity and be signed by a registered medical practitioner. It must also bear or incorporate the symbol established by current regulations.

6.D. Advice for pregnant drivers

Seat belts must always be worn in all seats of the vehicle, bearing in mind that:

- The lower (lap) belt should be worn as low as possible, below the abdomen, snug against the hip

bone, avoiding direct pressure on the uterus. The diagonal strap (chest strap) should pass centred over the collarbone, between the breasts and across the abdomen. This reduces the force that the seat belt would exert on the uterus in the event of a collision, ensuring that the mother is supported by her own bone structure.

- Extreme caution should be exercised during the first trimester because the foetus is still developing and there is less amniotic fluid (less cushioning) and during the third trimester because the baby is already quite large.

- It is advisable to travel accompanied from the thirtieth week of pregnancy onwards.

- Avoid driving close to the steering wheel (at least 25 cm away) to prevent impact in the event of a collision.

- If you are involved in a collision, always consult your gynaecologist and pay close attention over the next 48 hours, as there is a risk of premature termination of pregnancy. In the event of an accident, even a minor one, you should undergo a gynaecological examination due to the risk of premature placental abruption, foetal distress or foetal death.

- The seat belt saves lives, of mothers and foetuses. The best way to protect the foetus is to protect the mother, and the best way to protect the mother is with a seat belt.

- Consult your doctor about the road risks of conditions that may be associated with pregnancy (diabetes, high blood pressure, etc.). You should bear in mind that certain pregnancy-related disorders (changes in blood sugar levels, changes in blood pressure, vision problems, circulatory problems in the legs) can impair your ability to drive.

- Take frequent breaks and avoid long journeys.

- Once your child is born, you must protect them as you did during pregnancy. Keep them safe in the car from their very first journey, on both short and long trips, using an appropriate child restraint system for their age and weight.

UNIT 7. CARDIOVASCULAR DISEASES

7.1. Arrythmias
7.2. Coronary heart disease
7.3. High blood pressure
7.4. Heart failure
7.5. Valvular heart disease
7.6. Vascular disease
7.7. Heart transplant
7.8. Congenital heart disease
7.9. Syncope

Driving a vehicle does not require significant physical effort; restrictions are only necessary in certain circumstances where situations may arise that reduce the driver's perception or response capacity. Cardiovascular disorders in general can be linked to an increased risk on the road, mainly due to the acute symptoms that may appear while driving.

7.A. How do they affect the ability to drive?

The road risk in this group of diseases is due to sudden or chronic reduction in cerebral blood flow, with the consequent risk of reduced attention and loss of consciousness. To assess the risk of cardiac syncope, the existence of heart disease that favours its onset and the probability of recurrence must be taken into account.

Changes in oxygen levels, which cause vulnerability to fatigue, reduce concentration, facilitate distractions and impair motor response, both at the cerebral and motor levels.

Thus, the signs that may be observed in drivers with cardiovascular disorders include, among others:

- *Reduced driver attention, including not only sudden loss of consciousness associated with reduced cerebral blood flow of cardiac or vascular origin, but also reduced concentration related to inadequate gas exchange associated with various situations.*

- *Perceptual disorders, especially related to visual impairment. Dizziness, feeling of instability and balance disorders.*

- *Vegetative manifestations, pain, angina, both in relation to coronary ischaemic disorders and in relation to ischaemic disorders in the extremities.*

- *Manifestations due to association with other disorders, e.g. respiratory, diabetes, etc.*

The presence of symptoms characteristic of heart disease, such as dyspnoea, chest pain, syncope, presyncope, fatigue, palpitations or oedema, affect the ability to drive to varying degrees. The limitations they impose on driving are not based so much on the physical ability to perform driving tasks, but rather on the risk of sudden onset of symptoms, primarily arrhythmia or syncope.

It is important to assess the functional class, for example using the New York Heart Association (NYHA) classification. Drivers with a functional class do not necessarily have impaired driving tasks, and the likelihood of sudden symptoms is limited. In functional classes II, III and IV, in which physical activity is progressively limited, an individual assessment will have to be made based on the patient's condition and the type of licence they are seeking.

Arrhythmias comprise a wide range of conditions which, although not in themselves disqualifying for driving, can sometimes increase the risk associated with loss of consciousness. However, only one in three syncope episodes that occur while driving is of cardiac origin. The risk of cardiac syncope is related to the existence of a risk heart condition and the likelihood of recurrence. In ventricular arrhythmias, once treatment has been established, a period of observation is necessary to confirm the absence of recurrence. Congenital long QT segments are subject to the same restrictions as ventricular arrhythmias, but not acquired ones (secondary to drug use or electrolyte disturbances).

Supraventricular arrhythmias generally do not cause problems for driving if they are asymptomatic. Otherwise, these symptoms should be assessed after appropriate treatment has been initiated.

In bradycardia, with or without a pacemaker, the presence of symptoms should be assessed. If they exist and require the implantation of a pacemaker, its effectiveness must be checked before restarting conduction.

Neurally mediated syncope: vasovagal syncope and carotid sinus hypersensitivity are the most common causes of loss of consciousness. It is important to investigate this in the medical history, as many patients do not report it spontaneously and it can be repetitive. The dual mechanism of production, bradycardia and vasodilation, sometimes makes treatment difficult, so its effectiveness must be assessed before advising a return to driving.

In the case of **heart failure**, the risk of malignant arrhythmia, syncope, and sudden death will be the most significant problems affecting driving. The intensity of dyspnoea is associated with ventricular function impairment, which will also be a marker of arrhythmic risk. Low cardiac output often causes loss of attention. In cases of hypertrophic cardiomyopathy, it is recommended to assess the risk of malignant arrhythmia based on a family history of sudden death, ventricular tachycardia on Holter monitoring, or a drop in blood pressure during exercise testing.

Ischaemic heart disease is a frequent challenge when assessing a driver's fitness. In addition to the ischaemic event, ventricular dysfunction and the possibility of recurrent ischaemia should be assessed. The restrictions imposed in different situations of coronary ischaemia can be found in the regulations section. In the case of unstable angina, where driving is not recommended, it is up to the cardiologist to determine when the condition has stabilised.

High blood pressure does not, as a rule, constitute a limitation for drivers, although it is always necessary to assess whether there are any visceral impacts that could pose a risk on the road and, in particular, to assess the presence of retinopathy. In general, patients who are properly treated should not be excluded from driving unless there is obvious decompensation.

Valvular heart disease only affects the ability to drive in serious situations, when the patient's functional status is severely impaired. The signs and symptoms that may appear are related to heart failure and the risk of arrhythmias, in addition to any associated diseases. Atrial fibrillation associated with mitral stenosis, with the consequent risk of syncope and the need for anticoagulation (see corresponding chapter), and ventricular dysfunction (for example, in mitral insufficiency, where we may observe signs of cardiomyopathy), are two conditions that interfere with the ability to drive. Likewise, the risk of sudden death and angina in aortic stenosis, or possible aortic dilatation in aortic insufficiency, advise against driving before these patients have undergone surgery.

In drivers **with prosthetic valves**, the risk of embolism is minimised with appropriate anticoagulant treatment and, unless there are arrhythmic problems or ventricular failure, driving returns to safe levels similar to those of the healthy population after a period of satisfactory evolution lasting several months.

In general, drivers with **large vessel aneurysms** or aortic dissection should not drive until they have undergone surgery, due to the risk of rupture and underlying ischaemic symptoms. In **peripheral vascular diseases**, as a general rule, and unless there is associated ischaemic heart disease, interference with driving is not common, as it does not require exertion that causes claudication.

The Spanish Society of Cardiology has recently launched a computer application that facilitates the assessment of patients with cardiovascular diseases for driving and facilitates the application of regulations. It is freely accessible at:
https://puedeconducirmipaciente.secardiologia.es/destinatarios.php.
In the event that cardiovascular patients present symptoms or report treatment for other accompanying conditions, the recommendations for those conditions should be considered in addition to the cardiological recommendations.

7.B. Effects of treatment on driving

Cardiovascular drugs act on the functioning of the heart and blood circulation. It is very important that patients are aware of the main beneficial effects, the form and frequency of administration, the correct dose and the possible side effects. Only then can they work with their doctor to achieve effective and well-tolerated treatment with the lowest possible risks.

These are generally long-term treatments, prescribed by a specialist and reviewed periodically. When used correctly, they improve the patient's quality of life with few side effects on driving.

The drugs most commonly used in cardiovascular diseases are:

Beta-blockers. Effective in preventing episodes of angina pectoris and lowering blood pressure, in some cases they have been reported to cause reduced alertness, increased reaction time, fatigue, dizziness, vertigo, concentration disorders or sleep disturbances. Those that have the least effect on driving ability should be chosen.

Diuretics. Due to different mechanisms of action, there are loop diuretics (furosemide, torasemide), thiazides (hydrochlorothiazide, among others) and potassium-sparing diuretics (spironolactone, eplerenone and amiloride). In non-potassium-sparing diuretics, potassium supplements are sometimes necessary to prevent effects on the heart as well as dizziness or fainting. Both are safe

when taken as prescribed. Undesirable effects for driving include dizziness, headache and muscle cramps.

Angiotensin II receptor antagonists, **calcium channel blockers or calcium antagonists prescribed** as antihypertensive drugs to prevent angina episodes and reduce heart rate. They are generally considered safe for driving.

Patients who drive and are being treated with antihypertensive drugs may experience hypotension, instability, dizziness, etc., especially at the start of treatment and when changing doses or drugs. This may affect attention and concentration. In addition, some of these drugs have enhanced effects when taken with alcohol.

Antiarrhythmics, the adverse effects of antiarrhythmics on driving vary, occasionally causing mental confusion, paraesthesia, tremors and, in rare cases, blurred vision.

Nitrates act as coronary vasodilators and may have the following side effects: headache, dizziness and light-headedness.

Antiplatelet and anticoagulant drugs, when poorly regulated, can cause bleeding and, among other undesirable side effects, dizziness and sudden loss of vision, which can occasionally make it impossible to drive.

Lipid-lowering agents: statins, fibrates, nicotinic acid and ezetimibe, used when statins cannot be used or in combination with them. Prescribed to maintain low cholesterol levels (as cardiovascular prevention), they can occasionally cause muscle pain that is uncomfortable when driving.

Since some are necessary for more than one cardiovascular condition, the potential risk to road safety will vary depending on the stability of the disease and the adverse side effects manifested in each case.

People with an implantable cardioverter defibrillator (ICD) may have presyncope or syncope episodes associated with device shocks during the first year after implantation, with a higher risk in the first six months. Patients are therefore advised not to drive during this initial period.

The probability of pacemaker failure is less than 1% per year when properly monitored, and the risk is very low when implanted for bradycardia.

In patients with prosthetic valves, the adequacy of anticoagulant treatment should be assessed.

7.1. ARRYHTMIAS

7.1.C. Regulatory reference on arrythmias

Group 1 drivers (non-professional)

7.1.C.1. Bradycardia: sinus node disease and AV node conduction disorders.

Fit without restrictions

No second-degree Mobitz II AV block, third-degree AV block or congenital AV block, even if asymptomatic. No other form of bradycardia associated with syncope.

Fit with restrictions

When treated with a pacemaker, with a favourable report from a cardiologist, permission may be obtained or extended with a reduction in the period of validity in accordance with the section on 'pacemakers'. If the condition is secondary to metabolic processes, drugs, ischaemia or other reversible causes, correction must be awaited before participation is permitted.

7.1.C.2. Left bundle branch block, bifascicular, trifascicular and bifascicular with long P-R.

Fit without restrictions

No history of syncope.

Fit with restrictions

When treated with a pacemaker, with a favourable report from the cardiologist, permission may be obtained or extended with a reduction in the period of validity in accordance with the section on 'pacemakers'.

7.1.C.3. Supraventricular tachycardias (including atrial fibrillation and flutter).

Fit without restrictions

When there has been no tachycardia with a history of syncope secondary to it or limiting symptoms. When the patient requires anticoagulation, restrictions due to this should be considered.

Fit with restrictions

With a favourable report from a cardiologist certifying effective treatment, permission may be obtained or extended with a reduction in the period of validity to 3 years.

7.1.C.4. Ventricular arrhythmias.

Fit without restrictions

Tachycardia without a history of syncope or limiting symptoms secondary to these and without sustained ventricular tachycardia with structural heart disease.

Fit with restrictions

With a favourable report from a cardiologist certifying effective treatment, the licence may be obtained or extended with a reduction in the period of validity to 1 year.

7.1.C.5. Long QT syndrome.

Fit without restrictions

No history of syncope, torsade de pointes (spiral tachycardia) or corrected QT greater than 500 ms.

Fit with restrictions

Once the patient has been treated, and following a report from a specialist, the driving licence may be obtained or extended with a period of validity of 1 year.

7.1.C.6. Brugada syndrome.

Fit without restrictions

No previous syncope and no history of sudden cardiac death.

Fit with restrictions

When the patient has been treated with an implantable automatic defibrillator, the corresponding section will apply.

7.1.C.7. Pacemaker users.

Not eligible for an ordinary licence (without restrictions).

Fit with restrictions

After a period of at least two weeks following implantation, and with a favourable report from a cardiologist verifying that the device is in good condition and the wound has healed, the licence may be obtained or extended for a period of 3 years.

7.1.C.8. Implantable automatic defibrillator users.

Not eligible for an ordinary licence (without restrictions).

Fit with restrictions

Three months after implantation of the defibrillator for secondary prevention and two weeks for primary prevention, the licence may be obtained or extended for a period of one year. In the event of an appropriate discharge, the licence may not be obtained or renewed until at least three months have elapsed without recurrence and with a favourable report from a specialist. In the event of inappropriate shocks, the licence cannot be obtained or renewed until measures to prevent further inappropriate shocks have been established.

7.1.C.9. People with mechanical cardiac assistance devices.

They will not be considered fit for ordinary driving.

Fit with restrictions

In cases of cardiac assist devices in patients in functional class I or II, with no history of ventricular arrhythmias and only with a favourable report from a cardiologist, a licence may be obtained or extended for a period of 1 year.

Group 2 drivers (professional)

7.1.C.1. Bradycardia: sinus node disease and AV node conduction disorders.

Fit without restrictions

No second-degree Mobitz II AV block, third-degree AV block or congenital AV block, even if asymptomatic. No other form of bradycardia associated with syncope is permitted.

Fit with restrictions

When treated with a pacemaker, with a favourable report from a cardiologist, permission may be obtained or extended with a reduction in the period of validity if its origin is secondary to metabolic processes, drugs, ischaemia or other reversible causes. Correction will be awaited before allowing participation.

7.1.C.2. Left bundle branch block, bifascicular, trifascicular and bifascicular with long P-R.

Fit without restrictions

No history of syncope. No alternating bundle branch block, even asymptomatic.

Fit with restrictions

When treated with a pacemaker and with a favourable report from a cardiologist, the licence may be obtained or extended with a reduction in the period of validity, as specified in the section on pacemakers.

7.1.C.3. Supraventricular tachycardia (including atrial fibrillation and flutter).

Fit without restrictions

No tachycardia with a history of syncope secondary to these or limiting symptoms. When the patient requires anticoagulation, the restrictions of anticoagulation must also be considered.

Fit with restrictions

With a favourable report from the cardiologist certifying effective treatment, the licence may be obtained or extended with a reduction in the period of validity to 2 years.

7.1.C.4. Ventricular arrhythmias.

Not eligible for an ordinary licence (without restrictions).

Tachycardias with a history of syncope or limiting symptoms secondary to syncope, or sustained ventricular tachycardia with structural heart disease, are not permitted. Tachycardias with a history of syncope or limiting symptoms secondary to syncope are not permitted. Non-sustained polymorphic ventricular tachycardia (VT), sustained VT or VT with indication for a defibrillator (ICD), or sustained VT with structural heart disease are not permitted, even if asymptomatic.

Fit with restrictions

With a favourable report from a cardiologist certifying effective treatment, the licence may be obtained or extended with a reduction in the period of validity to 1 year.

7.1.C.5. Long QT syndrome.

Unfit

Not permitted for professional licences, no exceptions.

7.1.C.6. Brugada syndrome.

Unfit

If there is a history of syncope or sudden cardiac death.

No exceptions will be made.

7.1.C.7. Pacemaker users.

Fit with restrictions

After a period of at least 4 weeks from implantation, and with a favourable report from a cardiologist verifying the good condition of the device and the healing of the wound, the licence may be obtained or extended for a period of 2 years.

7.1.C.8. Implantable automatic defibrillator users.

Implantable automatic defibrillators are not permitted.

7.1.C.9. Mechanical cardiac assistance device users.

Not permitted for professional driving licences.

7.1.D. Advice for drivers with arrythmias

The symptoms of your condition may affect your ability to drive to a greater or lesser extent. The greatest risk is related to the possibility of sudden symptoms, mainly arrhythmias or syncope (dizziness or loss of consciousness). It is therefore important that you follow your doctor's advice, who will be able to advise you on the risks involved in driving.

If you experience a sudden and intense feeling of breathlessness, chest pain, palpitations, dizziness or severe discomfort while driving, stop your vehicle in a safe place and seek help. If you experience these symptoms every time you carry out everyday activities, at home or at work, consult your doctor and stop driving in the meantime.

Adapt your driving habits to changes in your health. Bear in mind that driving in adverse conditions (heavy traffic, bad weather, etc.) will require extra attention and concentration. As far as possible, try to drive on familiar routes and keep your speed to a minimum. Do not drive if you feel dizzy or notice any changes in your vision, or if you find that you are frequently losing concentration at the wheel.

If you have been advised to have a pacemaker fitted, you should ask your cardiologist and a driver assessment centre how long you will need to wait before you can drive again after the procedure.

If you have an implantable defibrillator, ask your cardiologist how long you should wait before driving. This will depend on your situation and the type of licence you hold.

Remember that when you go for your licence review, you must take your latest report from your cardiologist to the Driver Assessment Centre so that the centre's doctor is aware of the status of your condition.

Always follow the instructions given to you by your doctor regarding your medication and consult him or her or your pharmacist if you have any questions.

Do not drink alcohol if you are going to drive.

If you are on sick leave and your profession is driving or requires driving, you must find out whether you would be in legal trouble if you drove while on sick leave.

7.2. CORONARY ARTERY DISEASE

7.2.C. Regulatory reference on coronary artery disease.

Group 1 drivers (non-professional)

7.2.C.1. Acute coronary syndrome (ACS).

Fit with restrictions

In cases of acute coronary syndrome that have passed at least 3 weeks, with a favourable report from a cardiologist, a driving licence may be obtained or extended for a period of 1 year. After the first year, the period of validity will be a maximum of 3 years.

7.2.C.2. Stable angina.

Symptoms of angina at rest, while driving or during light exertion (functional classes III and IV) are not permitted. Symptoms of angina are not permitted.

Fit with restrictions

After treatment has been started and in the absence of symptoms at rest or with light exertion, with a favourable report from the cardiologist, the driving licence may be obtained or extended for a period of 3 years.

7.2.C.3. Coronary revascularisation surgery.

Fit with restrictions

Six weeks after surgery, in the absence of ischaemic symptoms and with a favourable report from the cardiologist, the driving licence may be obtained or extended for a period of one year, to be subsequently determined at the discretion of a medical professional for a maximum period of three years.

7.2.C.4. Scheduled percutaneous coronary intervention.

Fit with restrictions

One week after the procedure, in the absence of angina at rest or during minor exertion, and with a favourable report from the cardiologist, the driving licence may be obtained or extended for a maximum period of 3 years. If the procedure was due to acute coronary syndrome, the criteria in that section will apply.

Group 2 drivers (professional)

7.2.C.1. Acute coronary syndrome (ACS).

Fit with restrictions

In cases of a history of acute coronary syndrome, after at least 6 weeks, following a negative ergometric test and with an ejection fraction above 40%, with a favourable report from a cardiologist, a driving licence may be obtained or extended for a period of 1 year. After the first year, the period of validity shall be a maximum of 2 years.

7.2.C.2 Stable angina.

Fit with restrictions

Symptoms of angina are not permitted. After treatment has been initiated, and in the absence of symptoms, when functional tests show no evidence of severe ischaemia or exercise-induced arrhythmias, with a favourable report from a cardiologist, a driving licence may be obtained or extended for a period of 2 years.

7.2.C.3. Coronary revascularisation surgery.

Fit with restrictions

Three months after surgery, in the absence of ischaemic symptoms, with a negative exercise test, ejection fraction greater than 40% and a favourable report from the cardiologist, the driving licence may be obtained or extended for a maximum period of one year.

7.2.C.4. Scheduled percutaneous coronary intervention.

Fit with restrictions

Four weeks after the procedure, in the absence of ischaemic symptoms, with a negative exercise test, an ejection fraction greater than 40% and a favourable report from the cardiologist, the driving licence may be obtained or extended for a maximum period of two years. If the procedure was due to acute coronary syndrome, the criteria in that section shall apply.

7.2.D. Advice for drivers with coronary artery disease

The symptoms of your disease (shortness of breath, fatigue, palpitations, etc.) may affect your ability to drive to a greater or lesser extent. In addition, you may be more prone to arrhythmias and loss of consciousness. It is therefore important that you follow your doctor's advice, as they will be able to assess whether you are at risk when driving.

Adapt your driving habits to changes in your health, bearing in mind that driving in adverse conditions (heavy traffic, bad weather, etc.) will require extra attention and concentration.

Avoid sudden manoeuvres, risky and unnecessary overtaking, and always drive at the speed limit.

If you have had an acute myocardial infarction, you should not drive for the following three weeks and, if you have a professional licence, you must wait six weeks and pass a stress test (ergometry).

If you suffer from angina pectoris, you should be able to carry out your normal daily activities without experiencing pain, palpitations or shortness of breath. If this is not the case, do not drive and consult your doctor.

If you have had surgery for ischaemic heart disease (e.g. a bypass, coronary angioplasty or a stent), you must refrain from driving for a short period of time, depending on your situation and the type of licence you hold. Consult your cardiologist or the Driver Assessment Centre.

Remember that when you go for your licence review, you must take your latest report from your cardiologist to the Driver Assessment Centre so that the Centre's doctor is aware of the status of your condition.

Always follow the instructions given to you by your doctor regarding your medication and consult him or her if you have any questions.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you must find out whether you could face any legal trouble if you drive during your sick leave.

7.3. HIGH BLOOD PRESSURE

7.3.C. Regulatory reference on high blood pressure

Group 1 drivers (non-professional)

Malignant hypertension (systolic BP ≥180 and/or diastolic BP ≥110) associated with imminent or progressive organ damage is not permitted.

Fit with restrictions

After the symptoms have subsided and BP is under control with a favourable medical report, the driving licence may be obtained or extended with a reduction in the period of validity to 3 years.

Group 2 drivers (professional)

High blood pressure.

Grade III hypertension (systolic BP ≥180 and/or diastolic BP ≥110) is not permitted.

Fit with restrictions

After the symptoms have subsided and BP is under control with a favourable medical report, the driving licence may be obtained or extended with a reduction in the period of validity to 2 years.

7.3.D. Advice for drivers with high blood pressure

If you have recently been treated for high blood pressure, take special care when driving. Also, if your dose has been changed or a new medication has been added, do so until you know how they affect your body.

Do not drink alcohol if you are going to drive.

If you have eye complications (retinopathy), avoid driving at night, at dawn and at dusk.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could face any legal trouble if you drive while on sick leave.

7.4. HEART FAILURE

7.4.C. Regulatory reference on heart failure

Group 1 drivers (non-professional)

Fit

If there are no alterations with objective or functional signs of decompensation or syncope. If coexisting with arrhythmias, these will be evaluated according to the corresponding sections.

There should be no symptoms corresponding to functional class IV (NYHA).

Fit with restrictions

In cases of HF with symptoms corresponding to functional classes I, II, and III, with a favourable report from the doctor responsible for monitoring, the licence may be obtained or extended with a reduction in the period of validity at the discretion of the doctor in functional classes I and II, and for a maximum of 1 year in functional class III.

Group 2 drivers (professional)

Unfit

When there are alterations with objective or functional signs of decompensation or syncope. If coexisting with arrhythmias, they will be assessed according to the corresponding sections.

There should be no symptoms corresponding to functional class III or IV (NYHA).

Fit with restrictions

In cases of HF with symptoms corresponding to functional classes I and II with a favourable report from the doctor responsible for follow-up and provided that the left ventricular ejection fraction is at least 35%, the licence may be obtained or extended for a period of 2 years in functional class I and 1 year in class II.

7.4.D. Advice for drivers with heart failure

If you experience sudden and severe shortness of breath, chest pain, palpitations, dizziness or severe discomfort while driving, stop your vehicle in a safe place and seek help. If you experience these symptoms every time you perform everyday activities, at home or at work, consult your doctor and stop driving until the symptoms disappear.

Remember that when you go for your licence review, you must take your latest report from your cardiologist to the Driver Assessment Centre so that the centre's doctor is aware of the status of your condition.

Always follow the instructions given to you by your doctor regarding your medication.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

7.5. VALVULAR HEART DISEASE

7.5.C. Regulatory reference on valvular heart disease

7.5.C.1. Valvular heart disease

Group 1 drivers (non-professional)

Unfit

Valvular heart disease with a functional grade of IV, or with episodes of syncope.

Fit with restrictions

Valvular heart disease with functional class I, II or III, with a favourable report from a cardiologist stating the absence of syncope, may be granted or extended for a period of 3 years in functional class I and II and 1 year in class III.

Group 2 drivers (professional)

Unfit

Valvular heart disease with functional class III or IV, or with an ejection fraction of less than 35%, or with syncopal episodes, will not be accepted. Severe mitral stenosis, severe aortic stenosis, or severe pulmonary hypertension, even if asymptomatic, will not be accepted.

Fit with restrictions

Valvular heart disease classified as functional class I or II, with EF greater than 35% and in the absence of syncope, with a favourable report from a cardiologist, may obtain or extend the licence with a reduction in the period of validity of 2 years in functional class I and 1 year in class II.

Patients with asymptomatic severe aortic stenosis with an ejection fraction greater than 55% and normal exercise testing may, with a favourable report from their specialist, obtain or extend their licence with a period of validity of one year.

7.5.C.2. Cardiac valve prostheses.

In drivers with prosthetic valves, the risk of embolism is minimised with adequate anticoagulant treatment and, unless there are arrhythmic problems or ventricular failure, driving returns to safety levels similar to those of the healthy population after a period of a few months of satisfactory evolution.

Group 1 drivers (non-professional)

Fit with restrictions

Six weeks after implantation, if surgical, and one month if percutaneous, provided that the requirements applicable to heart failure, arrhythmias and anticoagulation (if applicable) are met, and with a favourable report from your specialist, the licence may be obtained or extended for a period of three years.

Group 2 drivers (professional)

Fit with restrictions

Three months after implantation, if surgical, and one month if percutaneous, provided that the requirements applicable to heart failure, arrhythmias and anticoagulation (if applicable) are met, and with a favourable report from your specialist, the licence may be obtained or extended for a period of two years.

7.5.D. Advice for drivers with valvular heart disease

If you have undergone surgery to replace a heart valve, you must wait for the periods established in the regulations, depending on the technique used and the type of licence (non-professional or professional), before driving again. Ask your cardiologist and a Driver Assessment Centre.

If you suffer from a valvular heart disease and have not undergone surgery, remember that the symptoms of your condition (shortness of breath, fatigue, palpitations, chest pain, etc.) may affect your ability to drive to a greater or lesser extent. In addition, you may be more prone to arrhythmias and loss of consciousness.

Remember that when you go for your licence review, you must take your latest report from your cardiologist to the Driver Assessment Centre so that the centre's doctor is aware of the status of your condition.

Always follow the instructions given to you by your doctor regarding your medication.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

7.6. VASCULAR DISEASE

7.6.C. Regulatory reference on vascular disease

7.6.C.1 Regulatory reference on large vessel aneurysms

Group 1 drivers (non-professional)

Unfit

If the maximum diameter of the aorta, depending on its location and other factors such as Marfan syndrome or bicuspid aortic valve, poses a sudden risk of rupture and therefore requires surgery.

Fit with restrictions

When the aneurysm is below the indications for surgery, with a favourable report from a cardiologist, vascular surgeon or cardiac surgeon, the licence may be obtained or renewed with a period of validity established at the discretion of the medical examiner.

Group 2 drivers (professional)

Unfit

Not permitted if the maximum diameter of the aorta, depending on its location and other factors such as Marfan syndrome or bicuspid aortic valve, poses a sudden risk of rupture, and in any case when the aorta exceeds 55 mm in diameter.

Fit with restrictions

When the aneurysm is below the indications for surgery, with a favourable report from the cardiologist, vascular surgeon or cardiac surgeon, the driving licence or permit may be obtained or extended for a maximum period of 1 year.

7.6.D.1. Advice for drivers with an aneurysm

If you have been diagnosed with aortic dissection or an aneurysm, you will not be able to drive until you have undergone surgery and, subsequently, you must be free of symptoms of ischaemia and pass an annual review of your licence. For this review, you must always provide the Driver Assessment Centre with a report from the cardiologist or vascular surgeon who treated you.

Always follow the instructions given to you by your doctor regarding your medication.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could face any legal trouble if you drive while on sick leave.

7.6.C.2. Regulatory reference on peripheral arterial disease

For group 1 & 2 drivers

The possible association with ischaemic heart disease will be assessed.

7.6.D.2. Advice for drivers with peripheral arterial disease

Until the symptoms are under control and the cardiovascular risk persists, you should not drive.

You should be aware of the effects of the treatment prescribed to help stabilise your condition.

If you have been off work due to peripheral artery disease, you should not drive until the cardiovascular risk is under control.

If you are a professional driver and are on sick leave, you should not drive until you are discharged, following the instructions of your cardiologist and primary care physician.

7.6.C.3. Regulatory reference on carotid stenosis

Group 1 drivers (non-professional)

Unfit

Not permitted if you have neurological symptoms.

Fit with restrictions

If carotid stenosis has led to neurological pathology, the criteria for neurological restrictions will apply. In the case of clinical ischaemic heart disease, the corresponding criteria will apply.

Group 2 drivers (professional)

Unfit

Not permitted if they have neurological symptoms or severe asymptomatic stenosis.

Fit with restrictions

In the event that carotid stenosis has led to neurological pathology, the criteria corresponding to the pathology manifested will be applied.

In the absence of neurological symptoms, the absence of ischaemic heart disease must be confirmed.

7.6.D.3. Advice for drivers with carotid stenosis

The patient should be advised to stop driving if they experience symptoms such as weakness in the face or arm, difficulty speaking or understanding, dizziness or a feeling of imbalance.

The symptoms that can be caused by untreated carotid stenosis render the patient unfit to drive due to the loss of mental and physical abilities.

Once the symptoms have been resolved after medical and/or surgical treatment, driving may be resumed under the safety conditions indicated to avoid sudden cardiovascular risk.

7.6.C.4. Regulatory reference on venous diseases

Group 1 drivers (non-professional)

There must be no deep vein thrombosis.

Fit with restrictions

After resolution of the disease and with a favourable report from the specialist, the licence may be obtained or renewed with a reduction in the period of validity at the discretion of the medical examiner.

Group 2 drivers (professional)

Large varicose veins in the lower limbs and thrombophlebitis are not permitted.

Fit with restrictions

After resolution of the disease and with a favourable report from the specialist, the licence may be obtained or renewed with a reduction in the period of validity at the discretion of the medical examiner.

7.6.D.4. Advice for drivers with venous diseases

Avoid a sedentary lifestyle whenever possible; sitting for more than two hours while driving is not recommended.

Avoid heat in the lower limbs; in winter, try not to direct the heat from the heating towards your legs.

If you suffer from a venous disease in your limbs, ask your doctor if you can continue driving. Remember that in certain cases you may be at risk of embolisms that could endanger your life and the lives of others if you drive.

Always follow your doctor's instructions regarding medication.

Do not drink alcohol if you are going to drive.

If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

7.7. HEART TRANSPLANT

7.7.C. Regulatory reference on heart transplant

Group 1 drivers (non-professional)

Fit with restrictions

In cases of heart transplant with NYHA functional class I and II, with clinical stability and stable immunotherapy treatment, with a favourable report from the specialist, a driving licence may be obtained or extended for a period of 1 year.

Groups 2 drivers (professional)

Unfit

7.7.D. Advice for drivers with heart transplant

If, despite following the review and treatment protocols after surgery, you notice any symptoms of decompensation, you must stop driving until the symptoms have subsided.

Prolonged periods of driving or sections of road with heavy traffic that require concentration are not recommended.

7.8. CONGENITAL HEART DISEASE

7.8.C. Regulatory reference on congenial heart disease

Group 1 & 2 drivers

To be assessed on an individual basis, taking into account functional class, ventricular function, valvular disease, impact on pulmonary pressure and history of syncope or arrhythmias, considering the relevant sections.

Fit with restrictions

With a favourable report from the cardiologist, in which the complexity of the heart disease and the risk of complications have been assessed, and surgical correction, if necessary, the permit or licence may be obtained or extended at the discretion of the medical examiner.

7.8.D. Advice for drivers with congenital heart disease

Always follow the instructions given by your doctor regarding activities to avoid and medication to take.

Do not drink alcohol if you are going to drive.

If you are on sick leave due to recent symptoms and you are a professional driver or your job requires you to drive, you should find out whether you could face any legal trouble if you drive while on sick leave.

Cardiomyopathies

7.8.C.1. Regulatory reference on hypertrophic cardiomyopathy

Group 1 drivers (non-professional)

Fit with restrictions

With a favourable report from a cardiologist, confirming the absence of syncope and functional class IV, a driving licence may be obtained or renewed for a period of 3 years in the absence of symptoms, and 1 year in symptomatic patients.

Groups 2 drivers (professional)

Fit with restrictions

There must be no syncope or 2 or more of the following criteria: ventricular wall thickness greater than 3 cm, non-sustained ventricular tachycardia, history of sudden death in first-degree relatives or decrease in blood pressure during exercise. If the established requirements are met, the driving licence may be obtained or extended for a period of 2 years, with a favourable report from the cardiologist.

7.8.D.1. Advice for drivers with hypertrophic cardiomyopathy

If you suffer from hypertrophic cardiomyopathy, ask your doctor if you can drive. Remember that in certain cases you may be at risk while driving, which could endanger your health and that of others. Always follow your doctor's instructions regarding medication.

Do not drink alcohol if you are going to drive.

If you are on sick leave due to recent symptoms and you are a professional driver or your job requires you to drive, you should find out whether you could face any legal trouble if you drive while on sick leave.

7.8.C.2. Regulatory reference on other cardiomyopathies (e.g. arrhythmogenic right ventricular cardiomyopathy, non-compact cardiomyopathy)

The individual risk should be assessed considering the risk of syncope, arrhythmias and functional class, consulting the relevant sections.

Group 1 drivers (non-professional)

Fit with restrictions

With a favourable report from the cardiologist, considering the associated risks, the licence may be obtained or extended for a period of validity at the discretion of the medical examiner.

Groups 2 drivers (professional)

Fit with restrictions

With a favourable report from a cardiologist, which considers the associated risks and the particular risks of driving in this group, the licence may be obtained or extended for a period of validity at the discretion of the medical examiner.

7.8.D.2. Advice for drivers with other cardiomyopathies

If you suffer from cardiomyopathy and have experienced arrhythmia, fatigue, or swelling of the lower limbs, have difficulty breathing, or have had any loss of consciousness, ask your doctor if you can drive. Remember that in certain cases, driving may pose a risk to your health and the health of others.

Always follow your doctor's instructions regarding medication.

Do not drink alcohol if you are going to drive.

If you are on sick leave due to recent symptoms and you are a professional driver or your job requires you to drive, you should find out whether you could face any legal trouble if you drive while on sick leave.

7.9. SYNCOPE

7.9.C. Regulatory reference on syncope

Reflex, recurrent or vagal syncope is not permitted, except in cases where syncope occurs in circumstances that could never coincide with driving (e.g. during defecation or medical tests).

Recurrent or severe syncope due to coughing or swallowing is not permitted.

Group 1 drivers (non-professional)

Fit with restrictions

After six months without recurrence and with a favourable report from a cardiologist, the licence may be obtained or extended for a maximum period of two years.

Groups 2 drivers (professional)

Unfit

7.9.D. Advice for drivers with syncope

If you suffer from syncope, you must not drive. The likelihood of it occurring while driving is sufficiently high to make driving unsafe, as it could endanger your health and that of others.

Always follow your doctor's instructions regarding medication.

Do not drink alcohol if you are going to drive.

If you are on sick leave due to recent syncope and you are a professional driver or your job requires you to drive, you should find out whether you could face legal trouble if you drive while on sick leave.

UNIT 8. CEREBROVASCULAR DISEASES. STROKE.

There are a wide variety of factors that can influence the determination of driving fitness in this group of patient-drivers, depending on the consequences that manifest in each case and the degree to which they affect the ability to drive, taking into account the requirements established in the regulations.

Having suffered a stroke is a risk factor for road accidents. Despite this, most of these patients do not receive any information on the subject, are not assessed in this regard and decide for themselves whether they are fit to drive, often overestimating their abilities without being aware of their limitations.

Without significant motor impairments, other alterations may occur that can significantly compromise driving tasks and may go unnoticed.

To assess the road risk secondary to a stroke, we will consider the areas involved and their possible impact on the complex process of driving:

- Perceptual areas: these will result in sensory, visual and auditory impairments.
- Attention areas: these will reduce attention span and concentration.
- Cognitive areas: these will impair the processing of road information.
- Motor areas: these will cause motor impairments and slow, imprecise motor responses.
- The risk of suffering a new stroke, which varies between 4% and 14%, depending on the cause.
- The underlying cause, the patient's age and associated comorbidities (diabetes, hypertension, valve prostheses, use of drugs, etc.).
- The side effects of medication used in the treatment of the disease causing the stroke or in the functional and psychological recovery process (antispasmodics, anti-inflammatories, muscle relaxants, sedatives, antidepressants, etc.).

8.A. How do they affect the ability to drive?

In essence, we will consider the risk arising from alterations in:

- *Perception.*
- *Cognitive processing.*
- *Decision-making.*
- *Execution of precise motor responses.*

There is a double impact on road safety: on the one hand, the possibility of suffering a stroke while driving and, on the other, the presence of consequences of the stroke, which can interfere with the ability to drive. Studies on stroke and driving do not distinguish between ischaemic and haemorrhagic strokes, as both can cause neurological and cognitive deficits with similar characteristics.

Neurological deficits that limit the ability to drive after a stroke include hemiplegia, hemianesthesia, hemianopsia, vascular dementia, visuospatial neglect (ignorance of visual information in one half of the field of vision and unconscious 'forgetting' of the use of limbs, usually on the left side), psychomotor slowness (increased reaction time), attention deficit and alexia without agraphia (which will make it difficult to interpret certain traffic signs).

The consequences of stroke have a negative, sometimes dramatic impact linked to a loss of self-esteem. Returning to driving represents the final step towards independence and integration into the community.

Depending on the area affected, the possible consequences with an impact on driving would be: right hemispheric lesions (failures in visuospatial and visuoconstructive tasks, visual field problems such as neglect, divided attention and prolonged reaction time), left hemispheric lesions (language comprehension disorders and visual field defects) and lesions in the prefrontal cortex (difficulties in regulating behaviour and making decisions).

In terms of assessing the risk of recidivism, the ABCD2 scale estimates the risk based on a series of parameters, which can range from a very low risk for a score of 0 to a high risk for a score greater than 6.

ABCD2 scale (Risk of stroke recurrence)
(Taken from the medical-psychological examination protocol, 2022)

Parameters	Characteristics	Points
Age	>60	1
Blood Pressure	>140/90	1
Clinical Symptoms	Unilateral paresis. Language impairment without paresis.	2 1
Duration of Symptoms	> 60 min 10-59 min	2 1
Diabetes	Presence of diabetes	1

8.B. Effects of treatment on driving

When assessing road risk, the side effects of drugs used in the treatment of the disease causing the stroke or in the functional and psychological recovery process (antispasmodics, anti-inflammatories, muscle relaxants, sedatives, antidepressants, etc.) must be taken into account.

8.C. Regulatory reference on cerebrovascular diseases

Group 1 drivers (non-professional) & Group 2 drivers (professional)

Current regulations distinguish between transient ischaemic attack (TIA) and stroke or cerebral haemorrhage (ICTUS).

In the case of a transient ischaemic attack, for both Group 1 and Group 2 licences, a period of 6 months without neurological signs must have passed. Once this period has elapsed, with a favourable neurological report and at the discretion of a medical professional, the licence may be obtained or extended for a period of one year. In the case of a Group 1 licence, after 3 years with stabilisation of the process, at the discretion of a medical professional, the licence may be extended for a period of up to 5 years.

In the case of a heart attack or cerebral haemorrhage, the period that must elapse before the licence can be extended is one year, for both Group 1 and Group 2 licences, and in the event of consequences, there must be

no reduction in motor, cognitive or sensory functions or other manifestations that could interfere with driving. In these cases, a neurological report specifying the treatment and existing symptoms is required. Exceptionally, at the discretion of a medical professional, the licence may be extended for a period of one year with the prescription of compensatory measures, if necessary. In the case of a Group 1 licence, after 3 years, at the discretion of the medical examiner, the driving licence may be extended for a period of up to 5 years.

In the case of Group 2 licences, with a report from a neurologist stating the absence of motor, sensory or cognitive impairments or movement disorders that could interfere with the control of the vehicle, the prescribed treatment and the prognosis for improvement, in exceptional cases, at the discretion of the medical professional, the licence may be obtained or extended for a period of one year.

8.D. Advice for drivers after a stroke

- If you have suffered a stroke, you must not drive again until a period of time established by law has elapsed and you have passed a new psychological medical examination, even if your driving licence is valid.

- Do not drive if you notice any warning signs: drowsiness, abnormal movements, difficulty moving, vision problems, etc.

- After a stroke, there may be consequences that modify the conditions of your driving licence and make it necessary to adapt your vehicle to your new situation.

- Ask for advice! You may need a device in your car to make driving easier (power steering, steering wheel knob, adapted pedals, etc.). The Provincial Traffic Departments and Driver Assessment Centres can provide guidance.

- Adapt your driving habits to your state of health: try to drive with someone else, reduce your hours behind the wheel, do not use your car for work.

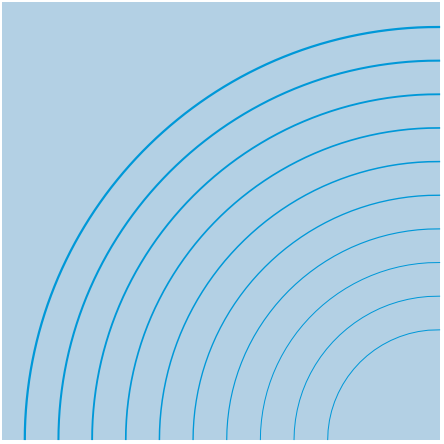
- Plan your trips, try to travel with someone else and avoid driving at night. Maintain your usual rest, meal and medication schedules.

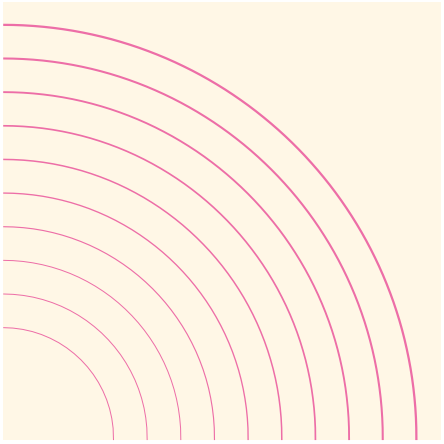
- Try to drive on familiar routes, avoiding rush hours, complicated journeys (with heavy traffic, multiple entrances and exits, etc.) and adverse weather conditions (fog, snow, rain, storms, etc.).

- Maintain the environmental conditions of the vehicle (temperature, noise, etc.) in order to avoid distractions.

- Wear shoes that support your feet to prevent slipping, which could cause you to lose control of the clutch, accelerator and brakes.

- If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could face any legal trouble if you drive while on sick leave.





UNIT 9. HAEMATOLOGICAL DISEASES

9.A. How do they affect the ability to drive?

The road risk of haematological diseases depends on the clinical picture, treatment and comorbidities resulting from haematological decompensation, such as venous thrombosis (hyperviscosity), strokes (atrial fibrillation), heart failure or cognitive impairment caused by anaemia.

Haematological diseases are divided into two groups, distinguishing between oncohaematological and non-oncohaematological disorders.

Scientific advances in the field of oncohematology have made it possible for many of these diseases to be managed chronically, with improved quality of life and reduced adverse effects of treatment. However, it should be noted that even the most benign processes, if decompensated, can pose a high road risk due to the likelihood of syncope, instability, sepsis, etc.

9.1. Haematological disorders

9.1.A. How do they affect the ability to drive?

For road safety purposes, the reference values set out in the following table are considered:

Haematological criteria for the assessment of drivers
(Taken from the medical-psychological examination protocol, 2022)

Hematological alteration	Reference values for this protocol
Severe anemia	Hb <8gr/dl.
Severe leukopenia	Leukocytes< 500 x µl.
Severe thrombocytopenia	Platelets < 20.000 x µl.
Pancytopenia	The sum of the three previous ones
Polycythemia	Hto >56% (Hemoglobin >20 gr/dl).
Leukocytosis	Leukocytes>100.000 x µl.
Thrombocytosis	Platelets >1.000.000 x µl.

Severe anaemia, leukopenia or thrombocytopenia (with the data already mentioned), polyglobulia (>56% Hto), leukocytosis (>100,000 x µl) and thrombocytosis (1,000,000 x µl), even if caused by non-serious problems such as iron deficiency due to metrorrhagia, carry a risk of syncope, dizziness, drowsiness, instability and general malaise. If these conditions have occurred in the last 3 months, a medical report should be requested (assessing the risk of recurrence and symptoms).

9.1.B. Effects of treatment on driving

The wide variety of haematological diseases means that there are different treatments available, making it necessary to assess the possible effects of each treatment on an individual basis.

In some cases, they are administered in a day hospital, can be self-administered or, in other cases, only monitoring of the progress of the process is necessary. Examples include intravenous iron treatment, the same route used for chemotherapy, transfusions of blood products, monoclonal antibodies or granulocyte-stimulating factors. In each case, the individual effects must be assessed. In any case, whenever outpatient or day hospital treatment is given, extreme caution must be exercised due to the after-effects.

9.1.C. Regulatory reference on haematological diseases

As a general rule, all patients who wish to obtain or extend their driving licence and who suffer from a serious haematological condition (cell series disorder) must provide a medical report referring to the risk of syncope, dizziness or other neurological disorders, at the discretion of the medical examiner. Compensatory preventive measures may be prescribed (e.g. reduction of the period of validity).

For people with a Group 1 licence, at least one month must have elapsed since the haematological disorder. For people with a Group 2 licence, this period is extended to three months. With regard to disorders associated with coagulation factor deficiencies, persons with severe deficiencies and undergoing regular replacement therapy must provide a report from a haematologist certifying that the disorder is properly controlled. In the case of a person with a licence from Group 1, the period of validity is reduced to two years. In the case of a person with a licence from Group 2, only serious disorders requiring occasional replacement therapy are permitted and the period of validity is reduced to one.

9.1.D.Advice for drivers with alterations in blood cell counts

- If you suffer from anaemia, leukopenia or thrombocytopenia, remember that even if it is mild and your test results are relatively good, if your anaemia has appeared recently, it may cause significant symptoms (asthenia, general malaise, drowsiness) that may affect your driving. It is these symptoms, and not your test results, that may interfere with your ability to drive.

- Always drive after adequate rest, avoid driving at night and try to drive with a passenger.

- If you notice any warning signs while driving (constant blinking, heavy eyes, difficulty focusing on road signs, strange shadows, ringing in the ears, hearing loss, increased sensitivity to noise, pressure in the head, numb arms, constant movement in the seat, slight deviations from the road, unjustified decrease or increase in speed), slow down and pull over to the side of the road

- Even if the cause of your anaemia is a minor condition, bear in mind that it is never 'normal' (for example, if you have heavy periods), and it is important to consult your doctor so that the cause can be monitored and appropriate treatment can be followed, with regular check-ups if the anaemia persists once you have recovered.

- Avoid driving if you have a blocked nose until it has cleared and you are sure that there is no further bleeding.

- Avoid long journeys in situations of venous stasis such as those that can occur with prolonged immobilisation, vasculitis, myeloproliferative disorders, etc.

- Avoid driving for 12 hours after giving blood (blood donors).

- If your anaemia is due to vitamin B12 deficiency, you may experience strange sensations in your extremities (paresthesia) or persistent headaches regardless of the degree of anaemia, which may interfere with your ability to drive.

- Iron deficiency without anaemia can cause significant fatigue and drowsiness, so it must be corrected appropriately before driving.

- Maintain an appropriate speed and avoid driving for more than 2 hours at a time.

9.2. Anticoagulant treatment

9.2.B. Effects of treatment on driving

For direct-acting anticoagulants: rivaroxaban, apixaban, edoxaban and dabigatran, it is important to assess the risk of syncope and dizziness that rivaroxaban may cause.

In the case of vitamin K antagonists (Sintrom®, warfarin, aldoxacrin), decompensation may occur during treatment, with particular attention to cases where hospitalisation has been necessary.

Treatment with low molecular weight heparin is usually preventive and short-term, so attention should be paid for at least one month after the end of treatment.

9.2.C. Regulatory reference on anticoagulant treatment

Group 1 drivers (non-professional) & Group 2 drivers (professional)

Group 1 drivers undergoing anticoagulant treatment may not drive during the first month of treatment. After the first month, there will be no limitation on the period of validity, except in the case of severe decompensation in the last year requiring hospitalisation, in which case, with a favourable report from their doctor stating that there is no significant risk of syncope due to severe decompensation or the side effects of treatment, the period of validity will be reduced to a maximum of two years. In most cases, anticoagulant treatment will not require limitation or restriction, but may be necessary due to the underlying condition.

For Group 2 drivers, the maximum period of validity of the licence will be one year, subject to a favourable report from their specialist and provided that one month has elapsed since the start of treatment. If a serious decompensation occurs, requiring hospitalisation, three months must elapse from the last decompensation before the licence can be obtained or renewed.

9.2.D. Advice for drivers on anticoagulant treatment

- Remember that a life that is as stable as possible promotes proper control of anticoagulant treatment. If this is difficult due to your work, try to maintain a regular schedule and a balanced diet.
- In the event of severe decompensation (INR less than 1.5 or greater than 6), your risk of thrombosis or haemorrhage increases significantly. In this case, you should avoid driving.
- If you experience spontaneous bleeding, you may be overly anticoagulated. Go to an emergency department or your usual control centre as soon as possible.
- Pay close attention to your doctor's advice regarding the possible side effects of your medication.
- Follow the treatment guidelines. Carry a card with you stating the reason for anticoagulation, the treatment regimen and previous check-ups.
- Maintain an appropriate speed and avoid driving for more than 2 hours at a time.
- Be aware of treatment with direct anticoagulants such as rivaroxaban, risk of syncope and dizziness.
- Pay special attention to treatment with low molecular weight heparin in pregnant patients.
- If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could face any legal trouble if you drive during your sick leave.

9.3. Oncohaematological disorders

9.3.A. How do they affect the ability to drive?

Scientific advances in the field of oncohematology have made it possible for many of these diseases to remain chronic, with an improved quality of life and a reduction in the adverse effects caused by treatments. However, it should be borne in mind that even the most benign processes, if they become unbalanced, can pose a high road risk due to the likelihood of syncope, instability, sepsis, etc.

It is important to bear in mind that the continuous evolution of drugs and the existence of new therapeutic approaches aimed exclusively at cell damage with few adverse effects, which make the disease chronic, have improved the quality of life of patients and the prognosis in many of these diseases.

We differentiate between processes with severe pancytopenia with Hb < 500 x µl + platelets

<20,000 x µl due to bone marrow infiltration and/or myeloablative treatment (risk of loss of consciousness, significant drowsiness, neurological problems that may impair driving and risk of recurrence); and without pancytopenia, which correspond to chronic conditions that may require more aggressive treatment or a transplant as they progress.

To assess whether there is a risk to driving, an oncology or haematology report is essential on the risk of loss of consciousness, significant drowsiness, risk of recurrence or neurological problems that may impair driving.

9.3.B. Effects of treatment on driving

Taking into account the current effectiveness of treatments, their lower toxicity, and the improved prognosis in many of the diseases (chronic lymphoid leukaemia, chronic myeloid leukaemia, low-grade lymphomas, and Philadelphia-negative chronic myeloproliferative disorders), in general, patients can continue driving with the prescription of preventive measures.

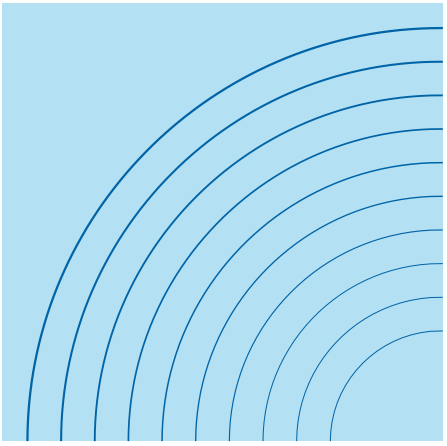
9.3.C. Regulatory reference on haematological malignancies

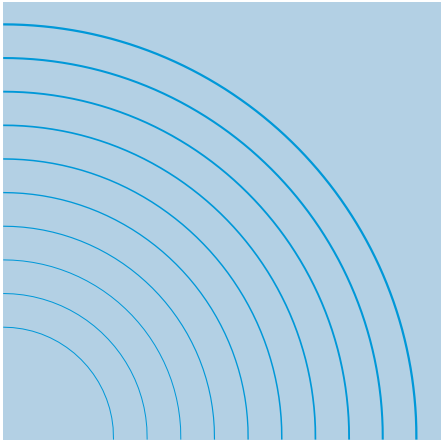
Group 1 drivers (non-professional) & Group 2 drivers (professional)

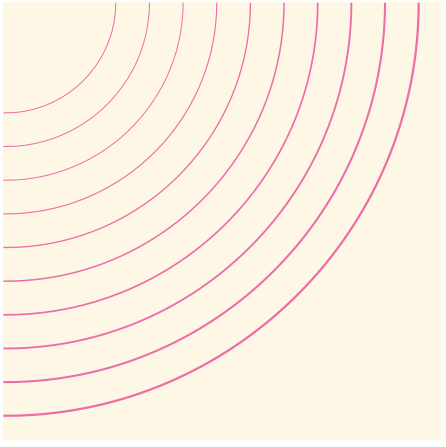
For both Group 1 and Group 2 licence holders, a complete remission of 10 years is required for an ordinary licence. However, after 3 months without serious alterations in the haematological series, with a report from the oncologist or haematologist, both Group 1 and Group 2 licences will be valid for one year. In the event of episodes of severe pancytopenia, for Group 2 licences, a period of one year without episodes is required. For Group 1 licences, after the first three years, the period of validity may be extended to 3 years, until 10 years of complete remission have been achieved.

9.3.D. Advice for drivers with oncohaematological diseases

- You should be aware that driving regulations do not allow the granting or extension of a driving licence to anyone undergoing chemotherapy for a haematological malignancy.
- In the event of splenomegaly (enlargement of the spleen), extreme caution must be exercised due to the risk of rupture and haemorrhage in the event of an accident.
- Change your driving habits if there are changes in your condition.
- Keep a regular sleep pattern, avoid driving at night, and get plenty of rest before travelling.
- When travelling, stop frequently (every hour) to rest. If you notice any symptoms (dizziness and/or vision problems), slow down and pull over to the side of the road.
- Do not drink alcohol if you are going to drive.
- If you are on sick leave and you are a professional driver or your job requires you to drive, you must find out whether you could face any legal trouble if you drive during your sick leave.







10. PSYCHIATRIC DISORDER

10.A. How does it affect the ability to drive?
10.B. Effects of treatment on driving
10.C. Regulatory reference on mental illness
10.D. Advice for drivers with mental illness

10.1. Bipolar disorder

10.1.A. How does it affect the ability to drive?
10.1.B. Effects of treatment on driving
10.1.C. Regulatory reference
10.1.D. Advice for drivers

10.2. Cognitive impairment

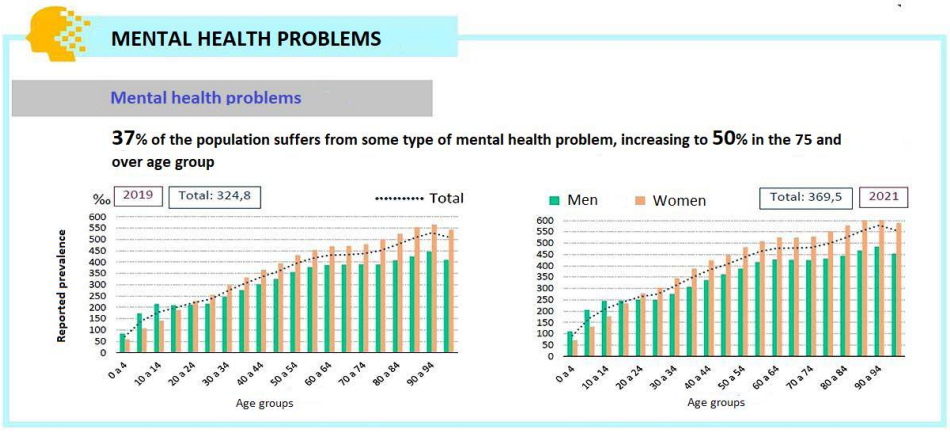
10.2.A. How do they affect the ability to drive?
10.2.B. Effects of treatment on driving
10.2.C. Regulatory reference
10.2.D. Advice for drivers

10.3. Functional and other psychosis

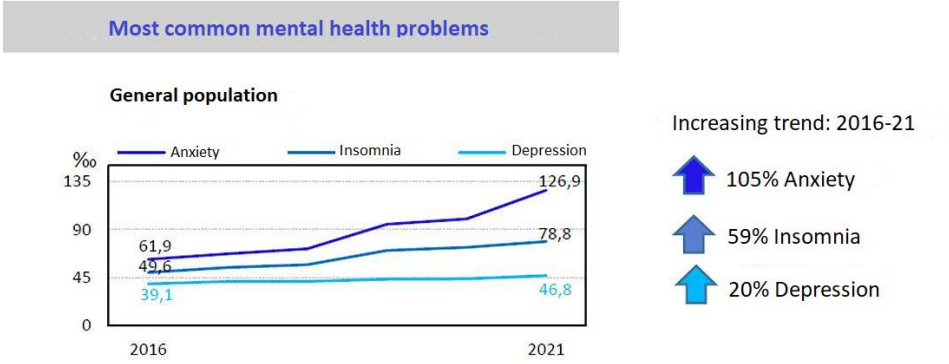
10.3.A. How do they affect the ability to drive?
10.3.B. Effects of treatment on driving
10.3.C. Regulatory reference
10.3.D. Advice for drivers

Taken together, patients with psychiatric disorders have a higher accident rate than the general population. There will be significant differences depending on the diagnosis and the stage of development (acute or chronic phase). The drugs used, which reduce symptoms and improve the relationship between the disease and driving, often cause significant side effects that make it advisable for patients to temporarily give up driving.

The ENSE National Health Survey, Spain 2017, concluded that in Spain 1 in 10 adults have a mental health problem (women almost twice as many as men), 3 in 10 people aged 65 and over (not including those in institutions) have cognitive impairment, 1 in 10 people take benzodiazepines and 1 in 20 adults take antidepressants.



Source: Annual report of the national health system, 2022



Let us also consider the existence of psychoactive drug users who are not classified in diagnostic groups.

10.A. How do they affect the ability to drive?

They can affect perception, cognitive processing, decision-making and the execution of precise responses in time and space to varying degrees.

Treatment improves symptoms, but can also interfere with road safety.

10.B. Effects of treatment on driving

All drugs used in the treatment of mental disorders have moderate (level II) or significant (level III) side effects on driving.

The following table shows the classification of adverse effects on driving of drugs used in mental disorders (taken from: Consensus document on drugs and driving in Spain: Information for the general public and the role of healthcare professionals).

N05 PSYCHOLEPTICS		DRUID CLASSIFICATION
N05A	***ANTIPSYCHOTICS***	
N05AA	**Antipsychotics: phenothiazines with aliphatic side chain**	
N05AA01	Chlorpromazine Oral administration Parenteral administration	 III III
N05AA02	Clorpromazina Oral administration Parenteral administration	 III III
N05AA03	Promazine	III
N05AE	**Antipsychotics: indoles**	
N05AE04	Ziprasidone Oral administration Parenteral administration	 II III
N05AF	**Antipsychotics: thioxanthenes**	
N05AF01	Flupentixol Oral administration Parenteral administration	 II III
N05AF05	Zuclopenthixol Oral administration Parenteral administration	 II III
N05AL	**Antipsychotics: benzamides**	
N05AL01	Sulpiride	II
N05AL03	Tiapride	II
N05AL05	Amilsupride	II
N05AL07	Levosulpiride	II
N05AN	**Antipsychotics: lithium**	
N05AN01	Lithium	II
N05CF	**Drugs related to benzodiazepines**	
N05CF01	Zopiclone	III
N05CF02	Zolpidem After 8 hours	III II
N05CF03	Zaleprom After 12 hours	III I
N05CH	**Agonists of melatonin receptors**	
N05CM	**Other hypnotics and sedatives**	
N05CM02	Clomethiazole After 8 hours	III I

N05AX	**Other antipsychotics**	
N05AX08	Risperidone Oral administration Parenteral administration	 II III
N05AX09	Clotiapine Oral administration Parenteral administration	 III III
N05AX12	Aripiprazole Oral administration Parenteral administration	 III III
N05B	***ANXIOLYTICS***	
N05BA	**Anxiolytics: benzodiazepines**	
N05BA01	Diazepam Oral administration Parenteral administration Other routes	 III III III
N05BA02	Chlordiazepoxide	II
N05BA04	Oxazepam	III
N05BA05	Potassium clorazepate Oral administration Parenteral administration	 II III
N05BA06	Lorazepam Oral administration Parenteral administration	 III III
N05BA08	Bromazepam	III
N05BA09	Clobazam	II
N05AG	**Antipsychotics: diphenylbutylpiperidines**	
N05AG01	Fluspirilene	II
N05AG02	Pimozide	II
N05AG03	Penfluridol	II
N05AH	**Antipsychotics: diazepines, oxazepines, thiazepines and oxepines**	
N05AH02	Clozapine	III
N05AH03	Olanzapine Oral administration Parenteral administration	 II III
N05AH04	Quetiapine	
N05BA11	Prazepam	III
N05BA12	Alprazolam	III
N05BA21	Clotiazepam	III

N05BB	**Anxiolytics: diphenylmethanes**	
N05BB01	Hydroxyzine	II
N05BE	**Azaspirodecanedione derivatives**	
N05C	***HYPNOTICS AND SEDATIVES***	
N05CA	**Barbiturates, single drugs**	
N05CA19	Thiopental	III
N05CD	**Hypnotics and sedatives: benzodiazepines**	
N05CD01	Flurazepam	III
N05CD02	Nitrazepam	III
N05CD03	Flunitrazepam Oral administration Parenteral administration	 III III
N05CD05	Triazolam	III
N05CD06	Lormetazepam	III
N05CD07	Temazepam	III
N05CD08	Midazolam	III
N05CD09	Brotizolam	III
N05CD11	Loprazolam	III
N06AB	**Selective inhibitors of serotonin reuptake**	
N06AF	**Antidepressants: non-selective MAO inhibitors**	
N06AF03	Phenelzine	II
N06AF04	Tranylcypromine	II
N06AG	**Antidepressants: MAO inhibitors A**	
N06AG02	Moclobemide	II
N06AX	**Other antidepressants**	
N06AX03	Mianserin	III
N06AX05	Trazodone Oral administration Parenteral administration	 III III
N06AX06	Nefazodone	II
N06AX11	Mirtazapine	III
N06AX16	Venlafaxine	II
N06AX21	Duloxetine	II
N06AX22	Agomelatine	II

N06	***PSYCHOSTIMULANTS***	
N06BA	**Centrally acting sympathomimetics**	
N06BA02	Dexamphetamine	II
N05BA04	Methylphenidate	II
N06D	***DRUGS FOR DEMENTIA***	
N06DA02	Donepezil	II
N06DA03	Rivastigmine	II
N06DA04	Galantamine	II
N06DX01	Memantine	II

10.C. Regulatory reference on mental illness

The proper application of the regulations and the determination of compliance with the specific legal criterion of competence or disability of the individual requires, in addition to clinical diagnosis, additional information on the functional impairment of the person and how this impairment affects the particular capacities in question.

To ensure this, a favourable opinion from a neurologist, psychiatrist or psychologist will be required, depending on the type of disorder.

Anxiety. Cases of intermittent explosive disorder or other disorders whose severity poses a risk to road safety are not permitted.

Depression. There must be no serious mood disorders that carry a high probability of behaviour that is dangerous to oneself or others.

Attention deficit. There must be no attention deficit disorders whose severity poses a risk to driving. Moderate or severe cases of antisocial disorder or other disruptive behaviours accompanied by aggressive behaviour or serious violations of rules that have a significant impact on road safety are also not permitted.

Cognitive impairment (dementia). There must be no cases of delirium, dementia or other amnesic or cognitive disorders that pose a risk to driving.

Schizophrenia. There must be no schizophrenia or delusional disorders. Other psychotic disorders involving incoherence, loss of associative ability, delusions, hallucinations or violent behaviour, or which for any other reason pose a risk to road safety, are also not permitted. Driving licences may be obtained or extended for a maximum period of one year if the applicant provides a favourable report from a psychiatrist or psychologist.

Psychosis. There must be no dissociative or adaptive disorders or other clinically significant problems that are functionally incapacitating for driving.

Impulse control disorders. Cases of intermittent explosive disorders or other disorders whose severity poses a risk to road safety are not permitted.

Intellectual development disorder. There must be no mental retardation with an IQ below 70. In cases of mental retardation with an IQ between 50 and 70, a licence may be obtained or extended if the applicant provides a favourable report from a psychiatrist or psychologist.

Personality disorder. There must be no catatonic disorders, particularly aggressive personality changes or other disorders that pose a risk to road safety. There must be no serious personality disorders, particularly those manifested in anti-social behaviour that poses a risk to the safety of others.

Group 1 drivers (non-professional)

All disorders will be assessed at the discretion of a medical examiner, taking into account the evolution, treatment and circumstances surrounding family, work and social factors.

Group 2 drivers (professional)

Only mood disorders, dissociative disorders, non-respiratory sleep disorders, impulse control disorders and personality disorders are permitted. These must be controlled by treatment and regular monitoring.

10.D. Advice for drivers with mental illness

- Consult the different sections of this unit.

10.1. Bipolar disorder

Patients generally alternate between periods of mania and depression with relatively symptom-free periods. In the manic phase, euphoric, expansive or irritable mood, together with symptoms such as grandiosity, distractibility, verbosity, agitation and involvement in risky activities or feelings of overestimation, make them risky drivers.

In the depressive phase, pathological sadness, pessimism, increased disinterest in survival, negative self-esteem, decreased attention, impaired decision-making ability, and reduced confidence in their abilities will cause drivers in the depressive phase to have impaired driving abilities.

Added to this are sleep disturbances (daytime hypersomnia and night-time insomnia), difficulty in processing environmental stimuli, increased anxiety and irritability. Serious complications include feelings of contempt for life, which lead them to avoid risk or deliberately engage in dangerous situations.

10.1.A. How does bipolar disorder affect the ability to drive?

In essence, we will consider the risk arising from:

- *Sleep disturbances.*
- *Anxiety.*
- *Attention deficit.*

- Increased reaction time. Indecisiveness.

Patients with bipolar disorder may experience:

Risky decision-making, intense (violent and dangerous) responses while driving, increased difficulty maintaining attention - easy fatigue, altered perception of reality, impaired decision-making ability, decreased speed and accuracy in performing manoeuvres, increased number of incorrect responses while driving, major changes in behaviour (increased aggressiveness and overestimation of their ability while driving), suicidal behaviour, suicide.

10.1.B. Effects of treatment on driving

Antidepressants: these can significantly affect the ability to drive, as they can cause varying degrees of sedation, orthostatic hypotension, *vertigo*, anxiety/agitation, behavioural changes, tremors, visual accommodation problems, etc. Serotonin reuptake inhibitor antidepressants have the fewest side effects. The increased risk during the first few days of treatment and when changing dosage regimens should be taken into account.

Remember that:

- Hypnotics should be adjusted to the natural sleep period to avoid residual drowsiness the following day as much as possible.

- Anxiolytics have a longer-lasting effect than hypnotics, which is why preparations with minimal side effects on driving should be chosen for drivers.

- Alcohol increases the sedative action of hypnotics and anxiolytics.

In general, drivers should be warned of the undesirable effects of drugs, which may include:

- Sedative effect: drowsiness, decreased alertness, increased reaction time.
- Anticholinergic effect: drowsiness, headaches, vertigo, blurred vision, etc.
- Stimulation reactions: muscle spasms, vertigo, insomnia, nervousness, irritability, tremors and tachycardia.
- Neuropsychiatric reactions: anxiety, depression, hallucinations, psychosis, behavioural disorders.
- Extrapyramidal and psychomotor coordination manifestations: muscle spasms, agitation, convulsions, motor incoordination, etc.
- Hearing disorders: ringing in the ears, tinnitus, temporary hearing loss.
- Circulatory disorders: arrhythmias, hypotension, cardiac arrest.
- Hypoglycaemia.
- Ophthalmological disorders: blurred vision, accommodation disorders.

These may affect drivers with the following risk levels:

LEVEL II (Moderate risk)
LEVEL III (Severe risk)

10.1.C. Regulatory reference on bipolar disorder

Group 1 drivers (non-professional) y Group 2 drivers (professional)

There must be no mood disorders that carry a high probability of risk to life or to others. Exceptionally, with a favourable report from a psychiatrist or psychologist, the period of validity may be reduced at the discretion of the medical examiner.

10.1.D. Advice for drivers with bipolar disorder

- Avoid driving during critical periods until your mood has recovered.

- Establish an honest dialogue with your doctor to decide together on the safest driving guidelines based on the current stage of your illness.

- Pay close attention to your doctor's advice regarding the possible side effects of your medication. If you notice any warning signs, such as drowsiness, abnormal movements, vertigo, tremors, or changes in vision, do not drive and inform your doctor. Stimulants do not actually eliminate fatigue, they only mask it.

- Do not drive in the first few hours after starting treatment and take special care when changing doses, whether increasing or decreasing them. The side effects of treatment are greater during the first few days and when changing doses.

- Adapt your driving habits to your state of health: reduce your hours behind the wheel and do not use your car for work.

- Plan your journeys, try to travel with someone else and avoid driving at night. Maintain your usual rest, meal and medication schedules.

- Try to drive on familiar routes, avoiding rush hours, complicated journeys (with heavy traffic, multiple entrances and exits, etc.) and adverse weather conditions (fog, snow, rain, storms, etc.).

- You should be able to easily recognise the symptoms of fatigue:

  - In the eyes: constant blinking, heaviness and blurred vision, difficulty focusing on signs, strange shadows, rubbing your eyes continuously.
  - In the ears: hypersensitivity to noise, abnormal ringing, hearing loss, etc.
  - Other: pressure in the head, numbness in the arms, inability to keep the head straight, unjustified startling, constant movement in the car seat, cold feet, heavy head, etc.

- Inappropriate road behaviour: veering slightly off the road, unjustified decrease or increase in speed, driving too close to other vehicles, taking corners too early or too late, loss of sense of speed, failure to change gears.

- You should not drive for more than 8 hours in a single day. Do not drink alcoholic beverages if you are going to drive.

- If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble if you drive while on sick leave.

10.2. Cognitive impairment

Dementias are processes that develop gradually. The early stages go unnoticed, even by those close to the patient. The diagnosis of dementia involves numerous cognitive deficits (including memory) that are severe enough to cause impairment in social or occupational functioning.

The decision about when a patient with dementia should stop driving is difficult, but the complexity of driving tasks suggests that driving may be compromised from the early stages of the disease.

10.2.A. How does cognitive impairment affect the ability to drive?

Dementia involves a decline in intellectual functions that must be global, affecting at least three of these functions, one of which must be memory (forgetting acquired information and having difficulty learning new facts). Other impaired functions may include language, praxias, visuospatial relationships, and judgement/reasoning. The decline must be acquired, persistent, and chronic. It causes difficulties in daily life or at work.

Among the causes of dementia that have been described, the most common are Alzheimer's disease and vascular dementia. The associated neurological impairments differ depending on the causes of dementia. Due to their frequency, we will consider:

- Alzheimer's disease, which manifests itself as: alterations in visuospatial orientation, apraxia.
- Vascular dementia, which manifests itself with focal problems, most often resulting from homonymous hemianopsia or hemispatial neglect.
- In American studies using the Clinical Dementia Rating Scale (CDR), it has been found that with a score of 0.5, the risk of accident for patients is similar to that of young people between the ages of 16 and 21 or driving under the influence of alcohol with a blood alcohol level below 0.08%.

In dementia, it must be taken into account that, as it is a condition that increases with age, patients will suffer from associated diseases and will therefore be on multiple medications.

10.2.B. Effects of treatment on driving

In essence, we will consider the risk arising from:

- Sleep disturbances
- Reduced attention
- Increased reaction time
- Indecisiveness (slow and imprecise decision-making)
- Psychological disorders (anxiety, nervousness)
- Undesirable effects of treatment

Acetylcholinesterase inhibitors (rivastigmine, donepezil) act specifically on attention deficits and may be helpful.

Be aware of the possible side effects of treatment for concomitant diseases.

Remind the patient of the impairment caused by alcohol consumption when driving.

Remember that sometimes patients do not decide to stop driving on their own, even if they have been involved in an accident.

Very mild forms (which do not meet the criteria for dementia according to the Diagnostic and Statistical Manual of Mental Disorders [DSM-IV]), with subjective memory difficulties, may drive as well as healthy people of the same age.

10.2.C. Regulatory reference on cognitive impairment

Group 1 drivers (non-professional)

There must be no cases of delirium or dementia. Amnesic disorders or other cognitive disorders that pose a risk to driving are also not permitted. If such conditions exist, with a favourable report from a psychiatrist or psychologist, the driving licence may be reviewed with a maximum validity period of one year.

Group 2 drivers (professional)

In these cases, it is not permitted to obtain or renew a driving licence.

10.2.D. Advice for drivers with cognitive impairment

- Try to drive with an adult passenger. Your family members can help you decide on the safest driving guidelines.
- Do not rely on your ability to recognise the real danger of your limitations.
- Avoid driving in adverse circumstances (heavy traffic, bad weather, at night, etc.) that will require extra attention and concentration.
- Take short, familiar routes. Long journeys are not advisable, even if you know the route well.
- Avoid rush hours and complicated journeys (heavy traffic, multiple entrances and exits, etc.).
- Avoid forced manoeuvres and risky and unnecessary overtaking.
- If you have started or changed any medication, avoid driving for the first few days until you know how you react to the changes.
- Do not drive if you notice any warning signs: drowsiness, abnormal movements, difficulty moving, vision problems, etc.
- Do not use the car for work.
- Avoid distractions other than driving (smoking, eating, drinking).
- Maintain an appropriate speed, do not exceed 120 km/h, and avoid driving for more than 1 hour at a time.

- Do not drink alcohol if you are going to drive.

- If you are on sick leave and you are a professional driver or your job requires you to drive, you must find out whether you could get into legal trouble if you drive while on sick leave.

10.3. Functional psychoses and other disorders

Among psychiatric disorders, alcoholism, dementia, personality disorders and paranoid ideas of any kind are the most likely to contribute to the accident rate among psychiatric patients. Stress and anxiety also generate a type of risky behaviour that can be addressed with appropriate medical advice.

Functional psychoses with neurobiological abnormalities (schizophrenia, delusional disorders, paranoia) cause significant alterations in perception, alterations in the course and/or content of thought, and disorganised behaviour. In patients with persistent delusions (persecutory, jealous, grandiose, etc.), road risk is directly related to the delusional content of their thoughts.

10.3.A. How do they affect the ability to drive?

In essence, we will consider the risk arising from:

- Sleep disturbances.
- Anxiety.
- Attention deficit.
- Variations in reaction time.
- Adverse effects of treatment.

The psychomotor consequences of these diseases will be:

- Alterations in perception, attention and concentration (high probability of distractions).
- Psychomotor performance may not be altered.
- Unpredictable reactions, both due to the course of the disease and the side effects of treatment.

Certain personality disorders (antisocial, narcissistic or borderline personalities) are associated with a greater propensity for reckless driving and, therefore, traffic accidents.

The characteristics of these personalities may appear temporarily or permanently, but in any case, personality disorders combined with alcohol consumption are one of the most significant risk factors for traffic accidents.

Drivers with stress and anxiety experience neuroendocrine and mental process activation and symptoms with cognitive, emotional and somatic components, which can be reduced in whole or in part with anxiolytic treatment.

The impact on road safety will be determined by reduced perception, increased fatigue, reduced concentration, increased impulsiveness, reduced selective attention, easy tiredness and reduced sustained attention. All of the above will make it more difficult to perform complex tasks and reduce responsiveness.

10.3.B. Effects of treatment on driving

Psychotropic drugs (benzodiazepines, antidepressants, neuroleptics): alter concentration, reaction time and speed of execution.

Antipsychotics (neuroleptics): cause drowsiness, extrapyramidal effects (dystonia, dyskinesia, etc.), orthostatic hypotension, cognitive impairment and visual disturbances.

Monoamine oxidase inhibitors (MAOIs): carry a risk of causing severe orthostatic low blood pressure.

Anxiolytics: new agonist anxiolytic molecules cause drowsiness, impaired reflexes, ataxia, impaired coordination and decreased concentration.

10.3.C. Regulatory reference on functional psychoses

Group 1 drivers (non-professional) & Group 2 drivers (professional)

As a general rule, persons suffering from mental disorders that pose a risk to road safety, schizophrenia or other psychotic disorders, dissociative disorders, impulse control disorders, personality disorders, attention deficit disorder and disruptive behaviour shall not be granted or have their driving licence renewed.

In all cases, the period of validity shall be reduced at the discretion of the medical examiner.

In exceptional cases and with a favourable report from a psychiatrist or psychologist, Group 1 non-professional licences may be obtained or renewed.

In exceptional cases and with a favourable report from a psychiatrist or psychologist, Group 2 professional licences may be obtained or renewed for mood disorders, dissociative disorders, non-respiratory sleep disorders and impulse control disorders.

10.3.D. Advice for drivers with functional psychosis

- Establish an honest dialogue with your doctor to decide together on the safest driving guidelines based on the current stage of your illness.

- Take your doctor's advice regarding the possible side effects of your medication very seriously. Avoid driving during the first few days of treatment and when your dose is changed.

- Do not drive if you notice any warning signs: drowsiness, abnormal movements, difficulty moving, vision problems, etc.

- Adapt your driving habits to your state of health: try to drive with someone else, reduce your hours driving, do not use your car for work.

- Stay calm at all times. Avoid external signs of stress: honking the horn, accelerating suddenly, looking at the clock, arguing, etc.

- Avoid forced manoeuvres and risky and unnecessary overtaking.

- You should be aware that treatment with psychotropic drugs often results in a level of driver response that is below the levels desirable for safe driving.

- The need to drive should not be an excuse to stop treatment or change the dosage schedule (time, dose). Do not drink alcohol if you are going to drive.

- If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could face legal trouble if you drive while on sick leave.

UNIT 11. METABOLIC AND ENDOCRINE DISEASES

Several studies show that 25% of the population has some form of metabolic disorder. Diabetes mellitus is the most common metabolic disease.

Drivers with diabetes mellitus may be at greater risk of accidents than the general population in certain circumstances. From a road safety perspective, the most important aspects to be assessed are hypoglycaemia and complications in the progression of the disease.

11.1. Diabetes mellitus
11.2. Hypoglycaemia episodes
11.3. Thyroid diseases
11.4. Parathyroid diseases
11.5. Adrenal diseases

11.1. Diabetes mellitus

Diabetes can affect a person's ability to drive, either through 'hypoglycaemia' or through damage to target organs such as the eyes, heart, peripheral nerves and blood vessels in the lower limbs.

The association of type 2 diabetes with central obesity, high blood pressure, dyslipidaemia, cardiovascular complications (coronary heart disease, stroke) and sleep apnoea (OSA) constitutes metabolic syndrome, with the corresponding associated comorbidity. The road risk of diabetes is compounded by that of associated diseases.

Diabetics who are aware of the symptoms of their disease, with good follow-up, adequate adherence to treatment and good awareness of the possible repercussions of complying with the guidelines that have been prescribed, will have a lower risk of decompensation and of this occurring while driving.

11.1.A. How does it affect the ability to drive?

The main danger for people with diabetes, whether treated with insulin or oral antidiabetic drugs, is the unexpected onset of hypoglycaemia.

Severe hypoglycaemia is theoretically defined as a situation so intense that it requires the assistance of another person (to deliver treatment) as it affects the level of consciousness and motor skills.

11.1.B. Effects of treatment on driving

The treatment that diabetics must follow to control blood sugar levels and avoid additional complications is personalised, based on the characteristics of the disease and its complications. Age and lifestyle are also taken into account. Generally treated with more than one medication, they require regular monitoring.

If the doctor is aware of the patient's driving habits, treatment guidelines can be adjusted to avoid the possibility of road risks.

Strict metabolic control is associated with an increased risk of hypoglycaemia, which is undesirable for road safety. Hence the importance of good diabetes education for drivers, especially professional drivers.

In addition to changes in treatment, lifestyle habits (physical exercise and diet) must also be considered in relation to the risk of hypoglycaemia, as these can be altered, especially during long periods of uninterrupted driving (more than two hours) and when the driver is a professional (more than seven hours of driving per day).

The impact of possible drug interactions on road safety must always be assessed.

Patients should be aware of the negative impact of alcohol use on their ability to drive.

The side effects of treatment for complications and pharmacodynamic alterations in diabetic patients with nephropathy should be considered.

Treatment options may include:

In type 1 diabetes:

Insulin: Prescribed by your doctor according to your particular needs. Options include short-acting, rapid-acting, intermediate-acting, long-acting, or combination insulins.

Amylinomimetic drug: Pramlintide (SymlinPen 120.60) is an injectable drug used before meals. It delays stomach emptying and reduces glucagon secretion after meals.

In type 2 diabetes:

Oral antidiabetic drugs help insulin utilisation and promote glucose elimination. Most are taken orally, some parenterally.

They are divided into two groups:

A) Hypoglycaemic agents:

- **Sulphonylureas**: These stimulate the pancreas to produce more insulin. Long-acting, high-potency sulphonylureas are not usually prescribed for elderly patients due to the increased risk of hypoglycaemia, which increases with age. These drugs include: glimepiride (Amaryl), glimepiride-pioglitazone (Duetact), glimepiride-rosiglitazone, Avandaryl, gliclazide, glipizide (Glucotrol), gliburide-metformin (Glucovance), tolbutamide (Orinasa, Tol-Tab), etc.

• **Meglitinides**: Hypoglycaemic agents that can cause significant hypoglycaemia. These include: nateglinide (Starlix), repaglinide (Prandin), repaglinide-metformin (Prandimet).

B) Antihyperglycaemic: Generally prescribed for diabetics with complications.

• **Biguanides**: The most common being metformin.

• **Alpha-glucosidase inhibitors**: Such as acarbose (Precose) and miglitol (Glyset)

• **Dipeptidyl peptidase-4 (DPP-4) inhibitors)** promote insulin production without causing hypoglycaemia. This group includes: alogliptin (Nesina), alogliptin-metformin (Kazano), sitagliptin (Januvia), sitagliptin-metformin (Janumet and Janumet XR), etc.),..

• **Glucagon-like peptide-1 receptor agonists (GLP-1 receptor agonists)** are prescribed when diabetes is associated with atherosclerotic cardiovascular disease, heart failure, or chronic kidney disease. This group includes: albiglutide (Tanzeum), extended-release exenatide (Bydureon), semaglutide (Ozempic), ...

• **Glitazones or thiazolidinediones** improve tissue sensitivity to insulin and increase the ability to utilise glucose. They carry an increased risk of heart disease. Options include: rosiglitazone (Avandia), rosiglitazone-metformin (Amaryl M), pioglitazone (Actos),..

• **Sodium-glucose transporter (SGLT) 2 inhibitors** work by preventing the kidneys from reabsorbing glucose. They are recommended for diabetics with atherosclerotic cardiovascular disease, heart failure, or chronic kidney disease. They include: dapagliflozin (Forxiga), canagliflozin (Invokana), canagliflozin-metformin (Invokamet), empagliflozin (Jardiance), empagliflozin-linagliptin (Glyxambi), empagliflozin-metformin (Synjard), …

Type 2 diabetics may also sometimes require insulin.

11.1.C. Regulatory reference on diabetes mellitus

Group 1 drivers (non-professional)

There must be no diabetes mellitus with severe metabolic instability requiring hospital care, nor diabetes mellitus being treated with insulin or hypoglycaemic drugs.

Whenever treatment with insulin or hypoglycaemic drugs is necessary, a favourable medical report must be provided, certifying that the disease is adequately controlled and that the person concerned has received adequate diabetes training. The maximum period of validity shall be five years, and may be reduced at the discretion of the medical practitioner.

Group 2 drivers (professional)

There must be no diabetes mellitus with severe metabolic instability requiring hospitalisation, nor diabetes mellitus treated with insulin or hypoglycaemic drugs.

Those affected by type 1 diabetes mellitus and those with type 2 diabetes requiring insulin treatment may, in very exceptional cases, obtain or extend their licence for a maximum period of one year, provided they submit a favourable report from the doctor monitoring their condition, certifying that the disease is adequately controlled and that the person concerned has received adequate diabetes training.

Those affected by type 2 diabetes who require treatment with hypoglycaemic drugs must provide a favourable report from the doctor who monitors them, certifying that they have good control and knowledge of the disease. The maximum period of validity shall be three years.

11.1.D. Advice for diabetic drivers

• Driving regulations establish restrictions on the period of validity of driving licences for both non-professional and professional drivers who suffer from diabetes, which vary depending on the type of treatment, the complications of diabetes and diabetes education. Find out about the liability you may incur if you do not comply with the legal requirements in force in this regard in terms of work and traffic.

• Always check your blood glucose levels before starting a journey. Do not drive if your glucose levels are too low (consult your doctor about safe blood glucose levels for driving, if applicable).

• Bear in mind that physical activity and your mental state (e.g. stress) can affect your insulin requirements.

• Learn to recognise the symptoms of hypoglycaemia (trembling, hunger, sweating, palpitations, etc.) and avoid the circumstances that cause it (stick to your rest, meal and medication schedules).

• Always carry foods rich in carbohydrates (biscuits, fruit, sweets, etc.) in your car, in addition to your usual medication.

• When travelling, protect your medication from cold and heat. Always follow the instructions given to you by your doctor regarding your medication and consult your doctor or pharmacist if you have any questions.

• Take extreme care when driving after changes in dosage or treatment until your blood glucose levels are under control.

• Do not drink alcohol if you are going to drive.

• Visit your ophthalmologist regularly. If you have vision problems, avoid driving at night, at dawn and at dusk.

• If you have foot problems, you should know that there are adapted pedals available for any vehicle.

• On long journeys, try to travel with someone else, stick to your meal times in relation to your medication and take frequent breaks.

• It is advisable to always carry identification as a diabetic.

• Driving regulations stipulate that, in order to determine their fitness to drive, diabetics must provide a recent report from their doctor to a Driver Assessment Centre, where, in addition to the report provided by the driver, the rest of their psychophysical conditions will be assessed.

11.2. Hypoglycaemia episodes

Hypoglycaemia is the main risk factor for accidents. Symptoms that can affect driving ability include tremors, palpitations, nervousness, anxiety, vegetative symptoms, tingling, hunger, fatigue, confusion, irritability, drowsiness, lack of coordination and vision problems.

As the disease progresses, consideration should be given to the manifestations of medium- and long-term complications, such as possible nephropathy, neuropathy, retinopathy, and cardiovascular disorders.

11.2.A. How do they affect the ability to drive?

Hypoglycaemia causes psychomotor and perceptual disturbances that lead to slowed reaction times and impaired psychomotor behaviour. This can result in sudden incapacitation to drive due to a total loss of control of the vehicle.

11.2.B. Effects of treatment on driving

Patients who drive and have recurrent hypoglycaemia should follow the treatment, instructions and warnings prescribed to them and should not drive until both the medication and the dose have been adjusted to their changing needs.

Treatment will prevent hypoglycaemia and avoid negative secondary consequences on vehicle control.

11.2.C. Regulatory reference on hypoglycaemia

Group 1 drivers (non-professional)

There must be no history of recurrent severe hypoglycaemia or metabolic disorders involving loss of consciousness in the last year.

In cases where hypoglycaemia occurs during waking hours, after at least three months without episodes, exceptionally with a favourable medical report, duly justified, certifying knowledge of hypoglycaemia, the licence may be obtained or extended for a maximum period of one year.

Group 2 drivers (professional)

Not permitted.

There must be no history of recurrent episodes of severe hypoglycaemia or metabolic disorders involving loss of consciousness in the last year.

11.2.D. Advice for drivers with hypoglycaemia

Preventive measures to avoid the onset of severe hypoglycaemia include:

- Attend regular medical check-ups.
- Not driving if your blood glucose level is equal to or below 5 mmol/L or if, while using a

continuous or instantaneous glucose monitor, the predicted glucose level shows a downward trend towards the hypoglycaemic range. This test should only be considered when the vehicle is parked.

• For professional drivers: use a continuous glucose monitor, if possible, with an active hypoglycaemia alert or alarm.

• Do not drive for more than two hours without planning to eat.

• Do not delay or skip a main meal.

• Self-monitor your blood glucose before driving and every two hours during the journey, if possible.

• Always carry glucose in the vehicle for self-monitoring.

• If symptoms of mild hypoglycaemia occur (sweating, tremors, hunger and tingling around the mouth, etc.):

- Stop the vehicle safely on the hard shoulder or, better still, in a safe place.
- Turn off the engine and remove the keys from the ignition.
- Self-treatment: take glucose.
- Check your blood glucose levels 15 minutes after treating the hypoglycaemia and make sure they are above 5 mmol/L.
- Do not drive again until at least 30 minutes after your blood glucose is above 5 mmol/L.

• If you experience severe hypoglycaemia, the minimum period of time before driving again should be 12 weeks, as this is often the time needed to restore stable glucose levels and behaviour. It also allows time for the altered consciousness associated with hypoglycaemia (neuroglycopenia) to normalise.

• Neuroglycopenia occurs when a person does not perceive the warning symptoms of mild hypoglycaemia, such as sweating, tremors, hunger, tingling around the mouth, palpitations and headache. This increases the risk of severe hypoglycaemia, which poses a risk to road safety.

• The prevalence of neuroglycopenia is between 20-25% in people with type 1 diabetes and 10% in those with type 2 diabetes. This prevalence increases in older people and in those with long-standing type 1 diabetes.

• Although acute hyperglycaemia can affect some brain functions, there is insufficient evidence to determine its effects on driving ability and road safety. Drivers should be advised not to drive on days when they are not feeling well.

• Comorbidity should be taken into account when assessing any diabetic person, checking for the most common conditions or pathologies, such as vision, peripheral neuropathy, cardiovascular disorders and OSA.

• Gestational diabetes is considered a self-limiting condition, and women with this type of diabetes should be advised and taught to recognise the symptoms and restrict driving when they appear.

11.3. Thyroid diseases

The complications of thyroid dysfunction and their repercussions are relevant to road safety.

To a large extent, thyroid diseases result primarily from autoimmune processes that lead to the overproduction of thyroid hormones (thyrotoxicosis) or cause glandular destruction and decreased hormone production (hypothyroidism).

Cardiovascular alterations in hypothyroidism or hyperthyroidism can alter cardiac function and increase cardiovascular morbidity and mortality. Therefore, it is important to achieve euthyroidism in order to avoid clinical manifestations in other organs with potentially devastating effects.

11.3.A. How do they affect the ability to drive?

People with hyperthyroidism complicated by significant visual, cardiac, neurological or muscular symptoms and patients with symptomatic hypothyroidism affecting motor skills should not drive until the condition has been controlled.

11.3.B. Effects of treatment on driving

Thyroid diseases that cause hyperthyroidism require antithyroid drugs (methimazole, neotomizole or propylthiouracil), which control hyperthyroidism but do not treat its cause.

Other drugs that inhibit the excessive action and symptoms of thyroid hormones are:

- **Beta-blockers**: atenolol, metoprolol, nadolol, bisoprolol, which are used to reduce symptoms such as palpitations, tremors, sweating and nervousness, without acting on thyroid hormone levels in the blood.
- **Anxiolytics** (lorazepam), in cases of anxiety and persistent insomnia.
- **Radioactive iodine**, prescribed when the patient's characteristics allow it. It is associated with few complications. It reduces the size of the thyroid and lowers the level of thyroid hormone in the blood.

The treatment of hypothyroidism with levothyroxine (T4, synthetic Eutirox®) at a dose adapted to the patient's needs is the paradigm of replacement therapy for hypothyroidism, as well as for disorders in which it is necessary to suppress thyrotropin (TSH) secretion).

Hypothyroidism can affect heart rate and mood, muscle weakness, cramps, flushing, fever, vomiting, menstrual disorders, increased intracranial pressure, tremors, agitation, sleep disturbances, sweating, weight loss, and diarrhoea. Some of these symptoms may affect psychomotor behaviour.

The choice of drug, dosage, and appropriate regimen will prevent possible complications.

11.3.C. Regulatory reference on thyroid diseases

Group 1 drivers (non-professional)

There must be no complicated hyperthyroidism with cardiac or neurological symptoms or symptomatic hypothyroidism, unless the person concerned has a favourable report from an endocrinology specialist.

When they do not prevent the obtaining or renewal of the licence and the periodic examinations to be carried out are for a period shorter than the validity of the permit or licence, the period of validity shall be set at the discretion of the medical examiner.

Group 2 drivers (professional)

Complicated hypothyroidism with cardiac or neurological symptoms or symptomatic hypothyroidism is not permitted.

11.3.D. Advice for drivers with thyroid disease

• Ophthalmological disorders caused by thyroid decompensation require frequent monitoring to avoid perception problems. These may include: tearing, loss of visual acuity, possibility of double vision and other visual disturbances resulting from protrusion of the eyeball.

• Cardiovascular manifestations of thyroid decompensation must be controlled with appropriate treatment. Hormonal interaction promotes homeostasis; therefore, when a local imbalance occurs, the risk of developing conditions such as high blood pressure, arrhythmias, and heart failure increases.

• Arrhythmia, with strong palpitations, causes nervousness, anxiety, and irritability, which do not promote the concentration necessary to make appropriate and accurate decisions.

• Especially if you are a professional driver, you should not drive when you have neurological symptoms such as pain, burning sensation, loss of sensation, and paraesthesia (tingling). Until they have been controlled with treatment.

• In situations of mood disturbance, cognitive processing and decision-making will be affected, so it is advisable to avoid driving in conflictive traffic circumstances, peak hours and adverse temperature conditions. Until the metabolic disturbance is controlled.

11.4. Parathyroid diseases

The parathyroid glands produce parathyroid hormone (PTH), which regulates the amount of calcium in the blood. Calcium is essential for the functioning of muscles, nerves and the heart. It also plays a role in blood clotting and bone formation.

When the concentration of calcium in the blood decreases, the parathyroid glands increase the production and secretion of PTH.

In hyperparathyroidism, the concentration of calcium in the blood is increased and calcium in the bones is decreased.

In hypoparathyroidism, there is a persistent or temporary deficiency of PTH. This manifests as low blood calcium levels.

11.4.A. How do they affect the ability to drive?

In general, with proper treatment, they should not show symptoms that interfere with driving.

Patients with hyperparathyroidism may have weak bones lacking calcium and osteoporosis,

which can cause fatigue, weakness, and pain that cause discomfort during prolonged driving, both in maintaining posture and in executing unexpected manoeuvres.

The feeling of weakness may be accompanied by lack of concentration, memory loss and confusion, which would affect prolonged periods of driving.

Patients with hypoparathyroidism complain of tingling in the fingers and toes, cramps and muscle spasms, which can cause problems with handling the steering wheel, handbrake and brake and accelerator pedals.

Other symptoms that do not promote driving safety include those related to heart rhythm disturbances and the possibility of developing cataracts.

11.4.B. Effects of treatment on driving

With proper monitoring, the side effects of the drugs used should not affect driving.

The treatment of primary hyperparathyroidism usually requires surgery, and in secondary hyperparathyroidism, the treatment of accompanying chronic renal failure must be considered.

The treatment of hypoparathyroidism requires calcium and vitamin D supplements, usually for life. In addition to recommending a diet rich in calcium and low in phosphorus. They are accompanied by **calcium antagonists**, amlodipine (Norvasc®), diltiazem (Cardizem®, Tiazac®, others), felodipine, nicardipine, verapamil (Verelan®), to allow the blood vessels to relax, as excess calcium can interfere with heart function.

Side effects of calcium antagonists include dizziness and extreme tiredness, which may affect prolonged periods of driving.

11.4.C. Regulatory reference on parathyroid diseases

Group 1 drivers (non-professional)

There must be no parathyroid diseases that cause increased excitability or muscle weakness, unless the person concerned has a favourable report from an endocrinology specialist.

When they do not prevent the granting or renewal of a licence and the periodic examinations to be carried out are for a period shorter than the validity of the licence, the period of validity shall be set according to the medical examiner.

Group 2 drivers (professional)

Parathyroid diseases that cause increased excitability or muscle weakness are not permitted.

11.4.D. Advice for drivers with parathyroid diseases

Patients with high hypercalcaemia with significant neurological symptoms, cardiac conduction abnormalities or muscular symptoms should not drive until it has been confirmed that they are responding adequately to treatment.

Short driving periods are recommended to avoid the onset of discomfort.

Night driving is not recommended due to the possibility of ophthalmological repercussions of parathyroid diseases.

11.5. Adrenal diseases

Addison's disease, an autoimmune hormonal disorder (adrenal insufficiency), which prevents the adrenal glands from producing enough hormones.

Cushing's syndrome, a hormonal disorder caused by excess cortisol production. Affected patients are characterised by: a full moon face, central obesity affecting the face, neck and abdomen, muscle atrophy of the extremities, high blood pressure, diabetes mellitus, osteoporosis, renal colic and capillary fragility leading to frequent bruising.

Pheochromocytoma, a tumour located in the adrenal glands, which produces catecholamine hormones, causing high blood pressure, headache, palpitations, instability and excessive sweating.

11.5.A. How do they affect the ability to drive?

Hormonal imbalance can cause high blood pressure, muscle weakness, mood swings, irritability and changes in blood sugar levels. These symptoms can affect attention, concentration and reaction times to varying degrees and cause fatigue during periods of imbalance.

11.5.B. Effects of treatment on driving

Treatment of Addison's disease involves hormone replacement therapy with corticosteroids and mineralocorticoids that are not synthesised. The most common adverse effects of corticosteroids are: osteoporosis, risk of pathological fractures, iatrogenic Cushing's syndrome, myopathies: proximal muscle weakness, marked muscle atrophy, mood swings and insomnia. These circumstances are not conducive to prolonged periods of driving.

The pharmacological treatment of Cushing's syndrome is carried out using drugs that reduce cortisol. If inadequately treated, it leads to multiple complications and higher mortality, mainly due to cardiovascular and infectious comorbidities.

Excess cortisol promotes infections and thromboembolism. It also causes changes in the central nervous system that are not always reversible, leading to neuropsychological (anxiety, depression) and cognitive (memory loss, reduced executive functions, etc.) alterations.

The treatment of pheochromocytoma is generally surgical, in cases of significant increases in blood pressure.

11.5.C. Regulatory reference on adrenal diseases

Group 1 drivers (non-professional)

Addison's disease, Cushing's syndrome and adrenal medullary hyperfunction due to pheochromocytoma are not permitted. Those affected by adrenal diseases must submit a favourable report from an endocrinology specialist stating that the symptoms are strictly controlled and treated. The period of validity of the permit or licence shall be a maximum of two years.

Group 2 drivers (professional)

Adrenal diseases are not permitted.

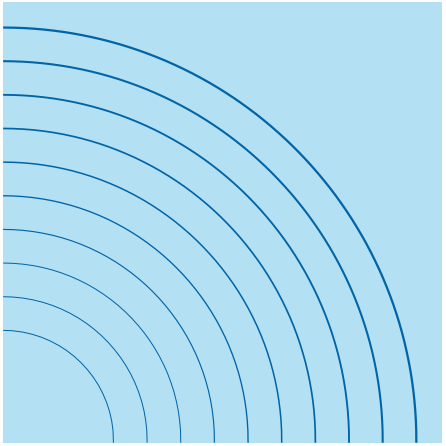
11.5.D. Advice for drivers with adrenal diseases

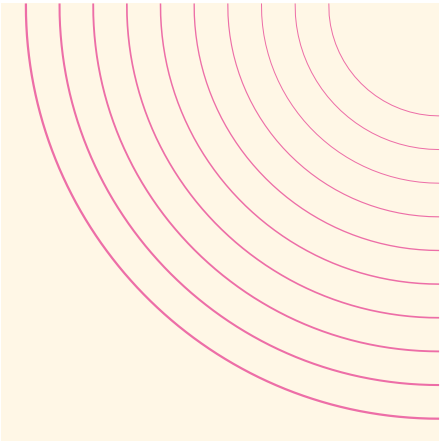
• People with adrenal disease: in the case of Cushing's syndrome (adrenal cortical hyperfunction) with muscle weakness, they should be advised to stop driving until it has been confirmed that they are responding to treatment, and they should always be monitored regularly. In cases of Addison's disease and pheochromocytoma, the same advice applies as for Cushing's syndrome.

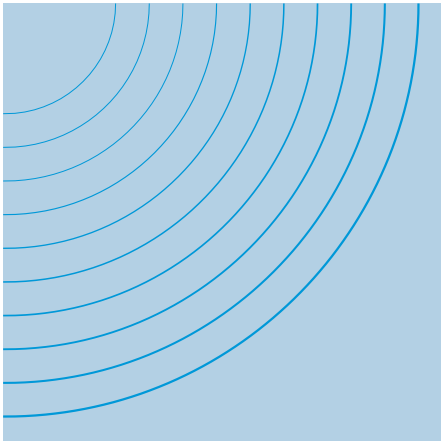
• People with acromegaly, a hormonal disorder caused by excess production of growth hormone in the pituitary gland, suffer from muscle weakness, pain, easy fatigue, significant neurological symptoms, visual disturbances, cardiac enlargement, sleep disorders or intractable headaches. They should stop driving and only resume driving after effective treatment has been established and the functional deficits have disappeared.

• As a preventive measure, in the case of any pituitary tumour that may affect the optic chiasm and cause visual field defects, it is advisable to have your visual fields examined at least once a year, making the validity of your driving licence conditional on any changes that may occur.

• If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could face any legal trouble if you drive during your sick leave.







UNIT 12. NON-HAEMATOLOGICAL ONCOLOGICAL PROCESSES

12.A. How do they affect the ability to drive?
12.B. Effects if treatment on driving
12.C. Regulatory reference
12.D. Advice for drivers

The variety of oncological processes, symptoms, treatments, side effects, etc., make it essential to assess each driver individually. It should be borne in mind that it is not the diagnosis that is important, but rather the impact that the process has on driving in all the aspects mentioned above.

12.A. How do they affect the ability to drive?

The main aspects to consider are:

- *The person's quality of life.*
- *Stage of development.*
- *Type of treatment.*
- *Presence or absence of neurological involvement.*

12.B. Effects of treatment on driving

It is essential to assess the type of treatment, whether it is active or not and, if so, whether it interferes with the ability to drive, as some of these do not impair the patient's quality of life.

Two situations must be differentiated:

- *Treatment for localised disease: this is done before or after surgery, but always in patients who are theoretically 'cured'. These generally require more lenient criteria.*

- *Active treatment for patients with metastatic disease. They can receive three types of treatment: chemotherapy, targeted therapies and immunotherapy.*

The types of treatments and/or combinations with the greatest overall impact, either due to their effects or their toxicity, and which may further compromise the ability to drive, are combinations of chemotherapy, and special mention should be made of patients undergoing treatment with opioids due to their risk of drowsiness. Furthermore, the presence or absence of neurological involvement: the presence of brain metastases or meningeal carcinomatosis and peripheral neuropathy >1 prevents the granting or renewal of a licence. Chemotherapy is the most common cause of peripheral neuropathy in cancer patients.

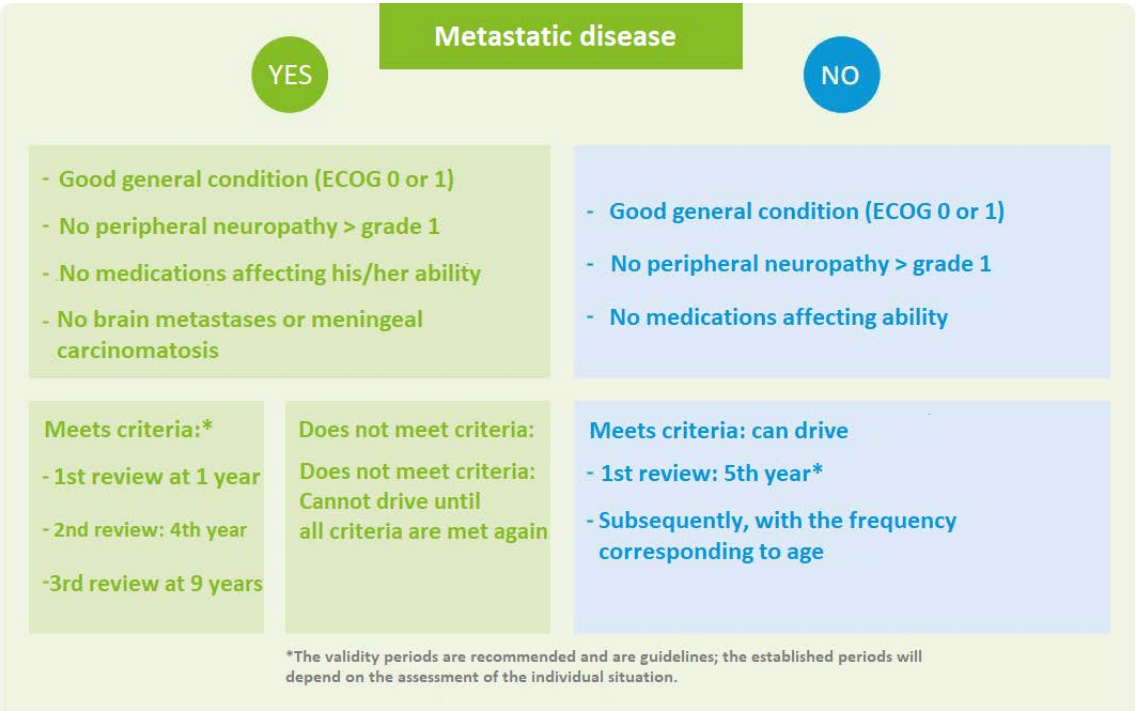
12.C. Regulatory reference on oncological processes

Until the publication of Order PRA/375/2018, there was no specific section on this type of pathology in the regulations on psychophysical conditions.

The Spanish Oncology Society provides criteria for assessing driving ability in people suffering from cancer.

The regulations refer to a specific assessment of oncological processes from a general perspective, evaluating aspects common to most oncological disorders that may have an impact on driving and therefore increase road risk. International guidelines are not very specific and refer to the sections on associated manifestations.

Assessment criteria for oncological processes
(Taken from the medical-psychological examination protocol, 2022)



Group 1 drivers (non-professional) & Group 2 drivers (professional)

The regulations state that for both Group 1 and Group 2 licences, there must be no loss of sensory, motor or cognitive capacity that seriously affects driving.

When there is a probable interference with driving, a report from the oncologist must be provided, specifically stating the absence of brain disease (metastasis), that there is no grade 2 or higher peripheral neuropathy, the symptoms (ECOG stage) and response to treatment. In these cases, the period of validity will be for one year. However, for Group 1 licences, if there is no evidence of disease and no treatment is being followed, with the oncologist's report and at the discretion of the medical examiner, the period of validity

may be that corresponding to age. In the case of Group 2, it is necessary to wait until 5 years of complete remission have elapsed before the period of validity can be that corresponding to age.

12.D. Advice for drivers undergoing cancer treatment

• Due to the different types of treatment, always consult your oncologist and avoid driving at the start of such treatments, at least until you know how you are responding to them.

• Change your driving habits if there are changes in your condition.

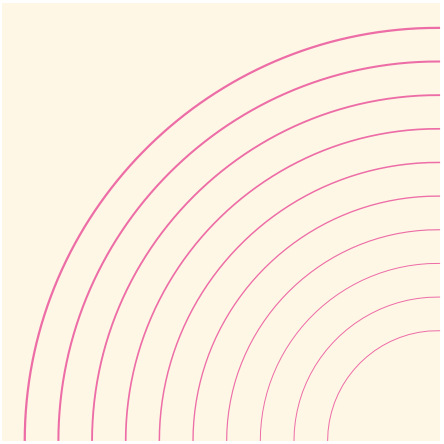
• Maintain a regular sleep pattern, avoid driving at night, and get enough rest before travelling.

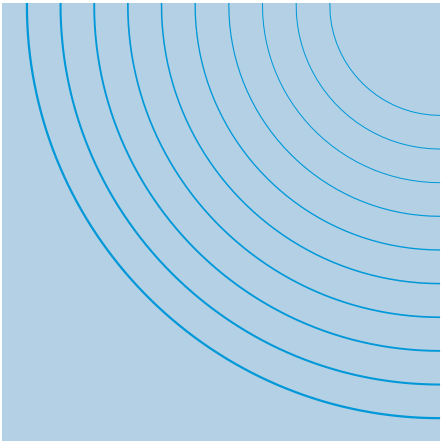
• When travelling, stop frequently (every hour) to rest. If you notice any symptoms (dizziness and/or vision problems), slow down and pull over to the hard shoulder.

• Do not drink alcohol if you are going to drive.

• If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble for driving while on sick leave.

• In specific situations, consult the professionals at the Driver Assessment Centre, for example, in the case of tracheotomies and motorbike riding, chest surgery and seat belt use, colostomies and seat belt use, head surgery and helmet use.





UNIT 13. NEUROLOGICAL DISEASES

The driver must assimilate the vehicle's 'behaviour' as their own and control it. The driver's nervous system also allows them, in addition to this control, to set a course, maintain navigation and, above all, anticipate events in order to modify and respond to changing and unforeseen situations using the information they receive through their sensory systems (mainly sight and hearing) and their central processing, in which executive functions and decision-making, memory and emotions play an important role.

There must be no diseases of the nervous and muscular systems that cause significant loss or impairment of sensory motor or coordination functions that involuntarily affect the control of the vehicle.

13.1. Epilepsy and seizures
13.2. Parkinson's disease
13.3. Neuromuscular diseases

13.1. Epilepsy and seizures

Epilepsy is a neurological disease in which patients have a sustained predisposition to epileptic seizures. The road risk of a driver with epilepsy is determined by the possibility of seizures with loss of consciousness at the wheel and associated problems, such as cognitive impairment, psychotic reactions or behavioural and intellectual capacity disorders.

13.1.A. How do they affect the ability to drive?

In treated epileptic drivers, it is essential to consider the adverse effects of antiepileptic drugs.

Professional and non-professional drivers who experience seizures as a result of injuries, illnesses or surgery during the period of validity of their driving licence should be informed of the implications of their condition for road safety so that they can attend a Driver Assessment Centre in order to adjust the conditions of their driving licence to their new situation. Some collective agreements in large companies have clauses linking workers with serious illnesses, such as this one, to other categories, which facilitate termination; however, this possibility is not widespread.

Road risk factors for epilepsy and seizures

- *The number of seizures (frequency of occurrence).*
- *The time elapsed since the last seizure.*
- *The probability of recurrence (which decreases as the seizure-free period increases).*
- *Age of onset of seizures.*
- *Withdrawal or changes in medication.*

- *Alcohol and drug use.*
- *Associated comorbidity.*
- *Type of seizure.*

Those most frequently associated with accident risk are:
- Complex partial seizures without aura.
- Generalised tonic-clonic seizures.

Those less frequently associated with accident risk are:

- Simple partial seizures.
- Complex seizures with aura.

Symptoms of epilepsy that interfere with the ability to drive:

Specific to the seizure: motor and consciousness disturbances.

Associated neurological problems (present in 60% of patients): intellectual, motor or sensory deficits, neurobehavioural problems, transient cognitive disorders, etc.

Psychomotor effects (to varying degrees), such as imprecise psychomotor response, alterations in reaction time and distractions.

In isolated seizures, the aetiology of the process (reactive to drug pressure, trauma, etc.).

13.1.B. Effects of treatment on driving

Antiepileptic drugs may cause (to varying degrees):

- **Nervous system disturbances**: drowsiness, confusion, disorientation, involuntary movements, ataxia, tremor, dizziness, dyskinesias and dystonias.
- **Psychological disturbances**: emotional lability, nervousness, irritability, abnormal thinking, akathisia, memory loss and loss of concentration.
- **Visual disturbances**: diplopia, diplopia, blurred vision, difficulty in accommodation, decreased visual field, loss of peripheral vision, photophobia.
- **Hearing disturbances**: vertigo and hearing loss.

In addition, disturbances that may increase road risk in certain situations include:

- *Inaccurate dosages prescribed for each moment and each patient.*
- *Non-compliance with treatment, due to voluntary discontinuation or forgetting one or more doses.*
- *Changes in medication (type of medication, guidelines, dosage, administration schedule).*
- *Drinking alcohol.*
- *Complicated, unplanned traffic situations, risky manoeuvres, etc., can compromise driving ability.*

Taking as a reference the categorisation of medicines according to their side effects on driving carried out in the European DRUID project.

In general, antiepileptic drugs cause moderate (II) to significant (III) side effects, undoubtedly

preventing acute episodes of decompensation, but chronically affecting psychophysical abilities for driving.

Treatment for drivers with neurological problems improves their quality of life, but we must not forget that it has side effects that can affect road safety.

Due to its importance, we provide the following summary:

DRUID CLASSIFICATION of ANTIEPILEPTICS

Antiepileptics: barbiturates adverse effects grade III
Phenobarbital
Primidone
Hydantoins
Antiepileptics: succinimides adverse effects grade II
Ethosuximide
Antiepileptics: benzodiazepines adverse effects grade II
Clonazepam

Parenteral administration adverse effects grade III

Antiepileptics: carboxamides adverse effects grade II
Carbamazepine
Oxcarbazepine
Rufinamide
Eslicarbazepine
Antiepileptics: fatty acids adverse effects grade II
Valproic acid

Parenteral administration adverse effects grade III
Vigabatrin adverse effects grade
Tiagabine adverse effects grade

Other antiepileptics adverse effects grade II
Lamotrigine
Topiramate
Gabapentin
Levetiracetam
Zonisamide
Pregabalin
Lacosamide

13.1.C. Regulatory reference

Group 1 drivers (non-professional)

There must be no central nervous system diseases that cause significant impairment of cognitive, motor, sensory or coordination functions, or abnormal movements of the head, trunk or limbs, which could interfere with the proper control of the vehicle.

Those affected by central nervous system diseases that affect driving must provide a report from a

neurologist stating: the clinical examination and current symptoms, the prognosis for the evolution of the disease, and the prescribed treatment.

At the doctor's discretion, the permit or licence may be obtained or extended, with a maximum validity of five years.

People affected by epilepsy with convulsive seizures or seizures with loss of consciousness.

If these have occurred during **the last year**, they must provide a favourable report from a neurologist stating the diagnosis, compliance with treatment, frequency of seizures and that the prescribed drug treatment does not prevent driving. The period of validity of the permit or licence shall be a maximum of two years.

In the case of **no seizures during the last three years**, the period of validity shall be a maximum of five years.

In the case of seizures **during sleep**, the licence or permit shall be valid for a maximum of two years, subject to a favourable report from a neurologist stating the diagnosis, adherence to treatment, the absence of other seizures and that the prescribed drug treatment, if any, does not prevent driving. If there have been no such seizures in the last three years, the period of validity shall be a maximum of five years.

In the case of **repeated epileptic seizures without any influence on consciousness** or the ability to act, it must be confirmed that at least one year has passed with only this type of seizure. A favourable report from a neurologist must be provided, stating the diagnosis, adherence to treatment, if applicable, the frequency of seizures and that the prescribed pharmacological treatment does not prevent driving. The licence will be valid for a maximum of two years.

In the case of **epileptic seizures caused** by an identifiable factor, a favourable neurological report must be provided, stating that the person has been seizure-free for at least six months. Other psychophysical aspects of the causative factor must also be taken into account. Drivers who cannot provide the aforementioned favourable report will not be considered fit to drive.

In the case of a **first or single unprovoked seizure**, a seizure-free period of at least six months must be certified by a neurological report. Drivers who cannot provide the aforementioned favourable report will not be considered fit to drive.

In the case of **other losses of consciousness**, these must be assessed in terms of the risk of recurrence and exposure to risk.

If a **seizure or loss of consciousness** occurs during a change or withdrawal of medication, one year without seizures must be proven once anti-epileptic treatment has been re-established. At the neurologist's discretion, driving may be prohibited from the start of treatment withdrawal and for a period of six months after treatment has ceased.

Group 2 drivers (professional)

Not permitted

There must be no central nervous system diseases that cause significant impairment of cognitive, motor, sensory or coordination functions, or abnormal movements of the head, trunk or limbs, which could interfere with the proper control of the vehicle.

People affected by epilepsy with convulsive seizures or seizures with loss of consciousness are only permitted if they have not required treatment and have not had any seizures in the last ten years.

People affected by epilepsy must provide a favourable report from a neurologist certifying that they have not required treatment or suffered seizures in the last ten years, that there is no relevant brain pathology or epileptiform activity in the EEG. The licence will be valid for a maximum of two years.

In the case of convulsive seizures or seizures with loss of consciousness **during sleep**. Permission is only granted when no treatment has been required and **no seizures have occurred in the last ten years**.

People affected by epilepsy must provide a favourable report from a neurologist certifying that they have not required treatment or suffered seizures in the last ten years, that there is no relevant brain pathology or epileptiform activity in the EEG. The licence will be valid for a maximum of two years.

In the case of **repeated epileptic seizures without influence on consciousness** or on the ability to act, it must be verified that at least one year has elapsed with only this type of seizure and without treatment. A favourable report from a neurologist must be provided, stating the diagnosis, the absence of other types of seizures and that no treatment has been required during the last year. The licence shall be valid for a maximum period of one year.

In the case of **epileptic seizures caused** by an identifiable factor, a favourable neurological report must be provided, certifying a seizure-free period of at least one year and including an electroencephalographic assessment. Other psychophysical aspects of the causative factor must also be taken into account.
In the case of a first or single unprovoked seizure, a seizure-free period of at least five years without anti-epileptic drugs must be certified by means of a neurological report.

In the case of a **first or single unprovoked seizure**, a seizure-free period of at least five years without antiepileptic drugs must be certified by means of a neurological report. At the neurologist's discretion and if there are good prognostic indicators, the required seizure-free period may be reduced.

In the case of **other losses of consciousness**, these must be assessed in terms of the risk of recurrence and exposure to risk.

Anti-epileptic medication is not permitted.

13.1.D. Advice for drivers with convulsive seizures

- You should be aware that when you go to a Driver Assessment Centre to obtain or renew any driving licence, you must bring a favourable report from a neurologist stating the diagnosis, adherence to treatment, frequency of seizures and that the prescribed pharmacological treatment does not prevent driving.

- Seizures can cause loss of consciousness, which would pose a high risk on the road, with consequences for you, your passengers and other drivers.

- Take extreme caution during the first few weeks after changing medication or missing a dose.

- Maintain a regular sleep pattern, avoid driving at night, and get plenty of rest before travelling.

- When travelling, stop frequently to rest (every two hours). If you notice any symptoms (dizziness and/or vision changes), slow down and pull over to the hard shoulder.

- Do not drink alcohol if you are going to drive.

13.2. Parkinson's disease

Neurodegenerative disease of the central nervous system. The average age of onset is around 55, although there are early forms of the disease (5-10% of patients are under 40 and 20% of patients are under 50). 1.7% of people over the age of 60 suffer from this disease.

13.2.A. How does it affect the ability to drive?

Parkinson's disease is the second most disabling neurodegenerative disease (after Alzheimer's disease). It causes motor impairment, which is evident in a progressive difficulty in performing basic activities of daily living (walking, eating, dressing, etc.).

The difficulties experienced by patients with Parkinson's disease when driving vehicles are due to the symptoms: resting tremor, rigidity, bradykinesia (slowing of movements), akinesia (difficulty in movement) and hypokinesia (reduction in the range of movements), impaired postural reflexes with a flexed posture, etc., which, even in the early stages of the disease, can:

- Make it difficult to perform simple motor tasks.

- Alter the automatic execution of complex learned movements.

- Be associated with non-motor manifestations such as depression (38%) or dementia, hallucinations (27%) and anxiety (20%). The patient may present cognitive alterations, which can appear early even in patients without dementia.

Patients have difficulty initiating movement and their reaction time is prolonged. Drivers with Parkinson's disease may respond normally to unexpected stimuli but poorly to familiar situations that require immediate decisions.

All of this will result in a slowed, imprecise psychomotor response with impaired coordination (poor control of the pedals, difficulty controlling the hands) and excessive fatigue.

Often, the disease itself causes them to give up driving. Most stop driving by personal decision or on the advice of family members. However, two out of ten patients continue to drive. Although Parkinson's patients as a whole are at greater risk than the general population, the risk factors are known and can, in part, be controlled.

The involvement of healthcare professionals and family members is essential in helping patients make the right decision about their driving habits at the appropriate time.

Occupational physicians should consider the disabling nature of the disease and advise patients to give up professional driving, even though this may leave them facing a situation of disability.

For commuting by Parkinson's patients in the early stages, while they continue to work, it will

be very important for occupational health professionals to advise them to use public transport or walk whenever possible.

13.2.B. Effects of treatment on driving

Pharmacological treatment of Parkinson's disease with levodopa or agonist drugs (bromocriptine, pergolide, ropinirole, etc.) significantly improves clinical symptoms, but does not prevent progression.

Some patients develop complications secondary to treatment that will have a significant impact on driving, such as:

- Fluctuations: motor oscillatory activity that appear and disappear several times a day in a sudden and unpredictable manner (on-off states). The appearance of these fluctuations is one of the most significant variables in the occurrence of accidents.
- Dyskinesias: abnormal involuntary movements, usually choreic.
- Drowsiness: sudden episodes of sleepiness associated with new dopamine agonists when used at high doses, mainly with pramipexole.

These complications make it necessary to warn these patients about the side effects of anti-Parkinson's drugs, especially the new dopamine agonists.

According to the DRUID classification, they are listed as having moderate (II) or significant (III) side effects for driving.

ANTI-PARKINSON'S DRUGS: ANTICHOLINERGICS adverse effects grade II

Trihexyphenidyl
Biperiden
Oral administration
Parenteral administration adverse effects grade III
Procyclidine
Orphenadrine

ANTI-PARKINSON'S DRUGS: DOPAMINERGICS adverse effects grade II

Levodopa*
Levodopa with decarboxylase inhibitor
(Levodopa+carbidopa
Levodopa+benserazide)
Levodopa + decarboxylase inhibitor + COMT inhibitor
(Levodopa+carbidopa+entocapone)

ADAMANTANE DERIVATIVES

DOPAMINERGICS:

DOPAMINERGIC AGONISTS adverse effects grade II

Bromocriptine
Pergolide
Ropinirole
Pramipexole
Cabergoline

Apomorphine
Piribedil
Rotigotine

DOPAMINERGICS: MAO B INHIBITORS adverse effects grade II

OTHER DOPAMINERGICS
Tolcapone
Entacapone

13.2.C. Regulatory reference on Parkinson's disease

The regulation does not expressly refer to Parkinson's disease. This would fall under the relevant section on diseases of the nervous and muscular systems.

There must be no diseases of the nervous and muscular systems that cause significant loss or impairment of motor, sensory or coordination functions that involuntarily affect the control of the vehicle.

13.2.D. Advice for drivers with Parkinson's disease

- The best option for patients with Parkinson's disease is to gradually stop driving vehicles in all circumstances.
- Consideration should be given to giving up professional driving.
- If, in the early stages, you maintain adequate control of your symptoms that allow you to continue driving, establish an honest dialogue with your occupational physician to decide together on the lowest-risk driving guidelines.
- If the progression of the disease allows you to drive, plan your trips, avoid driving at night, and maintain your usual rest, meal, and medication schedules.
- Do not drink alcohol if you are going to drive (alcohol can precipitate the onset of unwanted side effects of anti-Parkinson's drugs).
- If you do drive, only make short, familiar journeys, avoiding rush hour, complicated routes (with heavy traffic, multiple entrances and exits), adverse weather conditions (fog, snow, rain, storms) and forced manoeuvres (risky and unnecessary overtaking), and increasing the safety distance.
- When driving, maintain an appropriate speed, without exceeding the legal limit and always with the same environmental conditions in the vehicle (temperature, noise), in order to avoid distractions.
- Take your doctor's advice on the side effects of medication into account.
- If you notice any alarming symptoms while driving, such as drowsiness, tremors, abnormal movements, difficulty moving, etc., slow down and pull over to the hard shoulder.
- If you are on sick leave and your profession is driving or requires driving, you should find out whether you would be breaking the law by driving while on sick leave.

13.3. Neuromuscular diseases

Neuromuscular diseases are very varied. They are caused by pathologies that affect any of the components of the motor unit. They are classified as motor neuron diseases, sensory ganglion diseases, nerve root diseases, neuropathies, neuromuscular transmission diseases, and muscle diseases. Sometimes, several of the structures that make up the motor unit are affected. The common condition is progressive muscle weakness.

13.3.A. How do they affect the ability to drive?

Most neuromuscular diseases are genetic diseases with a slowly progressive course, where the deficits remain stable for a time; some may have a more aggressive course or occur in episodes. The episodic course and the possibility of relapse will determine the ability to drive.

The following possibilities should be considered:

- Muscle weakness that may prevent the proper use of the vehicle's pedals and levers.
- Impaired coordination of movements, as occurs in cerebellar diseases due to ataxia and incoordination of movement sequences, and in some neuropathies due to sensory ataxia secondary to impaired proprioceptive sensitivity.
- Muscle fatigue, a characteristic symptom of myasthenia gravis and some myasthenic syndromes, but which also appears in some muscle diseases, neuropathies or motor neuron diseases.
- Sensory disturbances.
- Impaired balance, as occurs in some neuropathies associated with otological involvement and in cerebellar ataxias.
- Alteration of the sensory organs, both visual and auditory, with a negative impact on the ability to drive. As occurs in certain muscular dystrophies, myopathies and some neuropathies.
- The association of possible involvement of other organs or systems, such as the cardiovascular and respiratory systems, which is common in some neuromuscular diseases.

13.3.B. Effects of treatment on driving

The pharmacological treatment prescribed will depend on the disease and the symptoms that manifest themselves. It may vary between corticosteroids, monoclonal antibodies, immunoglobulins, immunosuppressants, etc. In addition to physiotherapeutic treatments.

As the disease progresses, vehicle adaptations will often be required to facilitate manoeuvrability.

13.3.C. Regulatory reference on neuromuscular diseases

There must be no neuromuscular diseases that cause significant impairment of motor, sensory or coordination functions or tremors that could interfere with the proper control of the vehicle.

Group 1 drivers (non-professional)

People affected by neuromuscular diseases that affect driving must provide a report from a neurologist stating: the clinical examination and current symptoms, the prognosis for the progression of the disease and the prescribed treatment.

At the discretion of the doctor, the permit or licence may be obtained or extended, with a maximum validity of five years.

Group 2 drivers (professional)

Neuromuscular diseases are not permitted.

13.3.D. Advice for drivers with neuromuscular diseases

- Use of the vehicle must be conditioned by the disease, avoiding use of the vehicle when acute symptoms are present.
- Adjust your need to drive to the prescribed treatment, without deviating from the guidelines or altering the doses.
- Consider your particular sensitivity to medication if you are over 65 and/or have kidney failure, diabetes, or any other associated disease that requires treatment in addition to that for the neuromuscular disease.
- Before driving or operating machinery, you should know to what extent the medication you are taking affects your ability to perform these activities. If you notice that the medication affects your reflexes and ability to concentrate, causes excessive drowsiness, etc., you should consult your doctor and avoid driving, but do not stop taking the medication.
- Remember that drinking alcohol while taking medication can increase the risk of adverse effects (increased sedation and drowsiness, loss of reflexes, etc.) and also negatively affect your ability to drive. You should always avoid driving after consuming any amount of alcohol.
- If you have to drive regularly, you should always mention this so that the possibility of finding the medication that least affects your ability to drive can be assessed.
- You should avoid long periods of driving, taking a break every hour.
- You should avoid driving at night and during peak traffic times.
- If you require vehicle adaptations, orthoses, splints or any other device to facilitate manoeuvrability, these must be adjusted and updated to the needs of each stage of the disease.
- If your physical condition has changed, even if your driving licence is still valid, and you find it difficult to drive without aids, you must go to a Driver Assessment Centre to be reassessed.

UNIT 14. KIDNEY DISEASES

Often insidious in nature. Symptoms vary depending on the degree of involvement and may cause impairment in the ability to drive, resulting from neurological, psychological and sleep disturbances.

14.A. How do they affect the ability to drive?

In general, they can cause:

Decreased alertness, attention, and concentration. Perceptual disturbances. Imprecise decision-making. Slowed psychomotor response.

If kidney function is less than 20%, there may be decreased daytime alertness, attention and concentration, memory loss, tremors, myoclonus, drowsiness, progressive disorientation and reversal of sleep patterns.

The classification of chronic kidney disease (CKD) according to glomerular filtration rate allows road risk criteria to be established based on kidney damage and motor and cognitive manifestations that may interfere with the ability to drive. Stage 3b is set as the cut-off point at which road risk prevents a person from being fit to drive, due to cardiovascular manifestations (high blood pressure, anaemia), gastrointestinal manifestations (anorexia, nausea, vomiting), metabolic manifestations (increased blood urea nitrogen and serum creatinine levels), musculoskeletal manifestations (diffuse bone pain, fatigue and bone abnormalities) and neurological manifestations (peripheral neuropathy, cognitive impairment) that accompany this impairment.

Stages of kidney disease (CKD) according to glomerular filtration rate (GFR)
(Taken from the medical-psychological examination protocol, 2022)

Stage	FG Ml/min/1.73m2	Damage	Assess risk
1	>90	normal	-
2	60-89	mild	-
3a	45-59	mild-moderate	+-
3b	30-44	moderate-severe	++
4	15-29	severe	+++
5	<15	failure	++++

In Alport syndrome, ear involvement and eye disorders must also be considered.

Diabetes associated with nephropathy will increase the risk of hypoglycaemia and therefore the risk of road accidents.

14.B. Effects of treatment on driving

Effects of drugs: comorbidity requires patients to take multiple medications, with the consequent risk of accumulation of adverse effects and toxicity. Close monitoring is advisable with analgesics, anticonvulsants, and psychotropic drugs.

Dialysis may be associated with:

- Psychological disorders (depression and irritability).
- Secondary complications: Dialysis imbalance syndrome: headaches, nausea, vomiting, and seizures (more common at the beginning of the dialysis programme).
- Cardiac arrhythmias and intradialysis angina.
- Hypotension with intradialysis and post-dialysis dizziness that prevents the patient from driving for several hours afterwards.

After transplantation, despite the acceptable rehabilitation of the transplant patient, we must consider the high association with ischaemic heart disease, associated ophthalmological disease (diabetic and hypertensive retinopathy) and steroid cataracts.

Therefore, in cases of advanced or end-stage CKD, we must wait until dialysis is established as treatment for the condition before issuing a ruling. In this case, certain effects of the treatment will need to be assessed in relation to driving.

14.C. Regulatory reference on kidney diseases

Group 1 drivers (non-professional)

Kidney diseases are not permitted if their aetiology, treatment or manifestations could endanger the driving of vehicles.

People on dialysis may drive if they present a favourable report from their nephrologist at the Driver Assessment Centre, after passing the psychophysical aptitude test for driving. The period of validity of the driving licence may be reduced at the discretion of the examiner doctor.

People who have undergone a kidney transplant must wait six months after the transplant without any problems arising from it before they can drive. The period of validity of the driving licence may be reduced at the discretion of the examining doctor.

Group 2 drivers (professional)

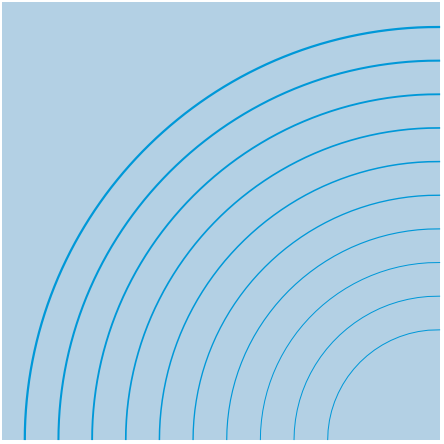
Kidney diseases are not permitted if their aetiology, treatment or manifestations could endanger the driving of vehicles.

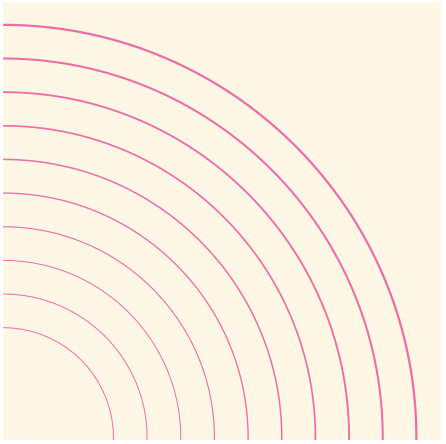
People on dialysis cannot obtain or renew a professional licence.

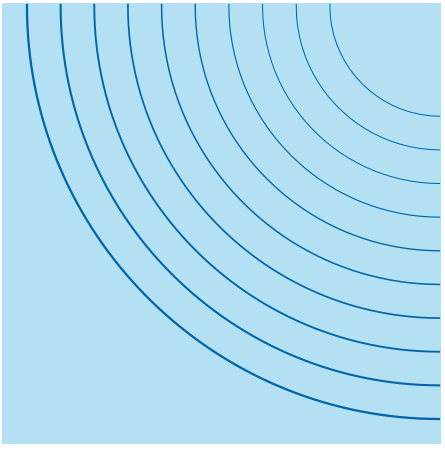
People who have undergone a kidney transplant, after six months without any problems arising from the transplant, may, in exceptional cases duly justified by a report from a nephrologist, obtain or renew their driving licence. The period of validity of the driving licence shall be a maximum of one year.

14.D. Advice for drivers with kidney diseases

- If you suffer from kidney failure, you are much more sensitive to the adverse effects of medication; therefore, do not self-medicate and be especially careful when changing medication and doses.
- You should not drive in the hours following a dialysis session.
- Do not travel for more than two days without scheduling and arranging with a dialysis centre.
- If you miss a dialysis session, avoid driving until 24 hours after resuming dialysis.
- If you feel even slightly sleepy while driving, you should stop in a suitable place and rest until you have recovered.
- Adapt your driving habits to changes in your health; driving in adverse conditions will require extra effort in terms of attention and concentration.
- Try to drive on familiar routes, avoiding rush hour and complicated journeys (with heavy traffic, multiple entrances and exits, etc.) and adverse weather conditions (fog, snow, rain, storms, etc.).
- Avoid forced manoeuvres and risky overtaking, making frequent stops.
- If you have vision problems, avoid driving at night, at dawn and at dusk.
- Do not drink alcohol if you are going to drive.
- If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble for driving while on sick leave.







UNIT 15. RESPIRATORY DISEASES. DYSPNOEA AND ASTHMA

15.A. How do they affect the ability to drive?

Road risk will be based primarily on the presence of dyspnoea. Dyspnoea is a symptom, a subjective sensation that can be defined in various ways: 'shortness of breath', difficult breathing, problems inhaling and/or exhaling. It corresponds to the subjective sensation of increased respiratory effort.

There are related sensations, such as tachypnoea (increased respiratory rate) and polypnoea (deeper than normal breathing), which can cause dyspnoea. See TABLE I.

There are two respiratory disorders that can cause 'paroxysmal dyspnoea' or intense chest pain or any other situation that poses a risk to driving:

- Asthma.
- COPD with bronchial hyperreactivity.

Neither of these two conditions can affect the driver so suddenly that they are unable to anticipate the situation and avoid it, so they seem to be more of a theoretical than a real risk to driving.

Pneumothorax can cause sudden episodes of asphyxia, but it is not possible to prevent road risk by thinking about this condition.

TABLE I. Differential diagnosis of dyspnoea

Cardiac origin:

- Congestive heart failure (right, left or biventricular).
- Coronary artery disease.
- Myocardial infarction (recent or old).
- Cardiomyopathy.
- Valvular disease.
- Left ventricular hypertrophy.
- Asymmetric septal hypertrophy.
- Pericarditis.
- Arrhythmias.

Respiratory origin:

- COPD (chronic obstructive pulmonary disease).
- Asthma.
- Restrictive lung diseases.
- Hereditary lung diseases.
- Pneumothorax.

Mixed; cardiac or respiratory origin:

- COPD with pulmonary hypertension and cor pulmonale.
- Detraining.
- Chronic pulmonary thromboembolism.
- Trauma.

Non-cardiac or non-respiratory origin:

- Metabolic (e.g., acidosis, polypnoea).
- Pain (tachypnoea).
- Neuromuscular diseases.
- Otorhinolaryngological disorders (larynx, trachea).
- Functional symptoms:
  - Anxiety (tachypnoea).
  - Panic (tachypnoea).
  - Hyperventilation.
- Intrapulmonary shunts in severe liver disease (platypnoea and orthodoxia).

The assessment of pulmonary respiratory function causing respiratory dyspnoea is performed using spirometry, which basically gives four possible results: normal, obstructive, restrictive, or mixed.

Normal spirometry in the presence of dyspnoea poses a clinical problem to be solved, but it is doubtful that we are dealing with respiratory incapacity to drive. This situation can occur in non-respiratory pathologies that present with dyspnoea, or in some respiratory pathologies that evolve into crises with recovery to normal, including asthma.

The obstructive pattern is the one we will see most frequently, due to the prevalence of obstructive diseases, in patients with dyspnoea. The most common causes of obstructive pathology are asthma and COPD. In many patients with obstructive pathology, both FEV1 and FVC are decreased in spirometry. In the context of driving ability as a result of the dyspnoea they can cause, the level of spirometric obstruction would correlate with very severe obstructive dyspnoea, with FEV1 values <35%. However, there is a strange and inconsistent relationship between the parameter and the symptom.

The restrictive pattern is characterised by a proportional decrease in both VC and FEV1. The most common causes of restrictive pathology are thoracic (kyphoscoliosis, obesity, and thoracoplasty). In the context of respiratory difficulties that affect the ability to drive, restrictive diseases are those of neuromuscular origin, which can also affect other functions essential for driving (locomotor system, nervous system, etc.). both those that generally progress rapidly and cause severe functional impairment of the musculoskeletal and respiratory systems, such as amyotrophic lateral sclerosis (ALS), and those that develop slowly, are compatible with an almost normal life and, of course, do not cause problems with driving, either due to dyspnoea or other reasons, during a significant part of their progression, such as multiple sclerosis or plaque sclerosis.

As in obstructive diseases, the limitation found in a dyspnoeic restrictive disease will be severe or very severe (FVC<50% or 35%, respectively).

The mixed pattern occurs when spirometry data show a combination of obstruction and restriction. In most cases, this pattern is due to the causes mentioned in the section on obstructive diseases. Examples of mixed patterns would be thoracic deformity with secondary COPD or obesity with secondary COPD in smokers.

15.B. Effects of treatment on driving

Several of the drugs used to treat dyspnoea and asthma (bronchodilators, corticosteroids, antihistamines, etc.) have effects on the ability to drive vehicles and operate machinery.

Asthmatic patients who drive should be warned about the danger of combining alcohol consumption with the adverse effects of medication.

Given the need to use oxygen while driving, the law refers to restrictions on driving for patients with pulmonary, pleural, diaphragmatic or mediastinal disorders that cause functional incapacity.

15.C. Regulatory reference on respiratory diseases (dyspnoea and asthma)

Group 1 drivers (non-professional)

There must be no permanent dyspnoea at rest or during mild exertion.

Group 2 drivers (professional)

There must be no dyspnoea during minor exertion or paroxysmal dyspnoea of any aetiology.

Other respiratory conditions:

Group 1 drivers (non-professional) & Group 2 drivers (professional)

There must be no pulmonary, pleural, diaphragmatic or mediastinal disorders that cause functional incapacity, assessing the disorder and its evolution, taking into account in particular the existence or possibility of paroxysmal dyspnoea attacks, severe chest pain or other disorders that may interfere with driving safety.

To assess the degree of dyspnoea and its likely interference with driving, the medical-psychological examination protocol proposes two questionnaires to approximate the road risk that patients with respiratory problems may present. These are the modified Medical Research Council (MMRC) scale and the Dyspnoea-12 questionnaire (Amado C et al 2018)

Grade	Activity	Intensity	Mark
0	Dyspnea only with very intense physical activity	normal	
1	Dyspnea when walking very fast or climbing a slight incline	mild	
2	Inability to walk at the same pace as other people of the same age	mild	
3	Shortness of breath that forces you to stop before 100 meters despite walking at their pace and on level ground	moderate	
4	Shortness of breath with minimal exertion during daily activities: dressing, or leaving their home	serious	

(Taken from the medical-psychological examination protocol, 2022)

Dyspnea Questionnaire-12				
This questionnaire is designed to help us understand how your breathing is affecting you. Please read each item and check the box that best describes your current breathing situation. If you do not experience any of the items, check the "none" box. Please answer all items.				
	None	A little	Quite a bit	A lot
1. When I take a breath, I can't completely fill my lungs.				
2. I have to make a greater effort to breathe.				
3. I feel like I can't breathe.				
4. I'm finding it hard to catch my breath.				
5. I can't get enough air.				
6. I find it uncomfortable to breathe.				
7. Breathing exhausts me.				
8. The way I breathe makes me feel down.				
9. The way I breathe makes me be dejected.				
10. My breathing worries me.				
11. The way I breathe makes me anxious.				
12. The way I breathe makes me more irritable.				

(Taken from the medical-psychological examination protocol, 2022)

15.D. Advice for drivers with respiratory diseases

• The regulations state that you should not drive if you suffer from permanent dyspnoea at rest or during mild exertion, or paroxysmal dyspnoea. For safety reasons, it is advisable to refrain from driving while any of these conditions persist.
• If your doctor has prescribed medication for dyspnoea and/or asthma, follow their instructions regarding driving, as some medications may affect your ability to drive. Avoid driving and/or take extreme caution in the first few days and when changing treatment.
• When driving, do not forget to always carry the bronchodilator medication prescribed by your doctor, in case you need it during the journey.
• For all lung diseases, it is advisable to: maintain filters and air conditioning properly and keep the interior of the vehicle clean. Do not smoke inside the vehicle and keep the passenger compartment well ventilated.
• When travelling, stop frequently to rest (every hour and a half or two hours). If you notice any respiratory symptoms, slow down and pull over to the side of the road. If you suffer an asthma attack or your breathlessness worsens, you should ask for help and stop driving.
• If you have had a permanent tracheotomy, avoid riding two-wheeled vehicles, as the lack of protection for the airway poses a risk of impact from particles or insects.
• Do not smoke and do not allow other occupants to smoke inside your vehicle.
• Do not drink alcohol if you plan to drive.
• If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could face legal trouble if you drive while on sick leave.

UNIT 16. MEDICATION and ROAD SAFETY

Developing a treatment plan requires the doctor to have knowledge of the disease, the therapeutic resources available, and the individual for whom the treatment is intended. It is important to include the patient's driving habits in their medical history in order to assess whether the disease they suffer from and the medications prescribed are interfering with their driving safety. This is a preventive measure that goes beyond the individual sphere due to the possible involvement of third parties in the event that the patient causes a traffic accident.

16.A. How do they affect the ability to drive?

Road risk will be determined mainly by:

Vision impairment.
Sleep disturbances.
Nervousness.
Anxiety.
Increased reaction time.
Reduced coordination.
Tremors.
Undesirable effects.

To reduce road risk attributable to the adverse effects of medication, it is important to:

- Include the patient's driving habits in their medical history and take them into account when prescribing drugs that may affect psychomotor performance and the ability to drive.

- Inform the patient of the possible influence of the disease and medication on their ability to drive.

- Consider, in addition to factors related to the drug itself, other risk factors related to:

  - The driver: age, individual sensitivity, state of health, mental state.
  - The medication: dosage, polypharmacy, self-medication, association with alcohol.
  - Driving habits: schedules, light conditions, weather conditions, traffic density, type of road used, etc.

16.B. Effects of medication on driving

- Sedative effect: drowsiness, decreased alertness, increased reaction time.
- Anticholinergic effect: drowsiness, headaches, vertigo, blurred vision, etc.
- Stimulation reactions: muscle spasms, vertigo, insomnia, nervousness, irritability, tremors and tachycardia.
- Neuropsychiatric reactions: anxiety, confusion, depression, hallucinations, psychosis, behavioural changes.
- Extrapyramidal and psychomotor coordination manifestations: muscle spasms, agitation, convulsions, motor incoordination, etc.
- Hearing disorders: ringing in the ears, tinnitus, temporary hearing loss.
- Circulatory disorders: arrhythmias, hypotension, cardiac arrest, hypoglycaemia.
- Ophthalmological disorders: blurred vision, accommodation disorders.

Section B (effects of treatment on driving) of each unit in this guide includes the road safety risk of the medicinal products used in the treatment of the conditions covered in the chapter.

Medicinal products are classified into three categories according to the intensity of their effects on driving:(I), (II), (III)

- **CATEGORY I:** may have moderate effects on the ability to drive.

- **CATEGORY II:** may have intense effects on the ability to drive.

- **CATEGORY III:** may have very severe effects on the ability to drive.

The main therapeutic groups that affect the ability to drive are described below.

H1 antihistamines

First generation: azatadine (II), clemastine (III), chlorphenamine (II), dexclorphenamine (II), diphenhydramine (III), mequitazine (II), promethazine (III).

Second generation: astemizole (I), azelastine (I), cetirizine (II), desloratadine (I), ebastine (I), loratadine (I), terfenadine (I).

Other H1 antihistamine preparations: cyproheptadine (appetite stimulant) (II), dimenhydrinate (motion sickness) (III), ketotifen (anti-asthmatic) (II), doxylamine (anti-emetic) (III), hydroxyzine (anti-tremor) (III), meclozine (anti-emetic) (II), cinnarizine and flunarizine (anti-vertigo, peripheral and cerebral vascular disorders) (II).

Negative effects on the ability to drive: the most common is sedation, which is more pronounced at the beginning of treatment, as well as anxiety, insomnia, dyskinesia, paraesthesia, visual disturbances and hallucinations.

It is recommended that driving be discouraged when taking first-generation antihistamines.

Analgesics and narcotic cough suppressants

Analgesics: buprenorphine (III), codeine (II), ethylmorphine (III), methadone (II), morphine (III), pethidine (III), pentazocine (III), tildine (II), tramadol (III).

Antitussives: pholcodine (II), codeine (II), dihydrocodeine (II).

Negative effects on the ability to drive: euphoria, sedation, vertigo, decreased concentration and cognitive ability, passivity.

It is recommended to advise against driving when narcotic analgesics are prescribed.

Antidepressants

Tricyclics: amitriptyline (III), clomipramine (II), doxepin (III), imipramine (II), nortriptyline (II), trimipramine (III).

Heterocyclics: maprotiline (II), mianserin (III).

MAO inhibitors: moclobemide (I), tranylcypromine (II).

Serotonin reuptake inhibitors: citalopram (I), fluoxetine (I), luvoxamine (I), paroxetine (I), sertraline (I).

Others: mirtazapine (III), nefazodone (II), reboxetine (I), lithium salts (II), trazodone (III), venlafaxine (II), viloxazine (II).

Negative effects on the ability to drive: sedation, orthostatic hypotension, fatigue, vertigo, anxiety/agitation, behavioural changes, tremor, vision changes. Serotonin reuptake inhibitors have the least effect on the ability to drive.

Patients should be clearly warned of the risk to driving, especially in the early days and during psychological changes.

Antiepileptics

Valproic acid (II), carbamazepine (II), clonazepam (II), diazepam (III), ethosuximide (II), felbamate (II), phenytoin (III), phenobarbital (III), lamotrigine (II), primidone (III), valpromide (II), vigabatrin (II).

Negative effects on the ability to drive: nystagmus, visual disturbances, ataxia, dyskinesia, tremor, sedation, drowsiness, confusional state, dizziness, loss of memory and concentration, fatigue and decreased psychomotor performance.

Patients should be clearly warned of the risk to driving until the disease is stabilised, and once stable they should be aware of the side effects of the medication.

Beta-blockers

Acebutolol (I), atenolol (I), betaxolol (I), bisoprolol (I), carvedilol1 (II), carteolol1 (I), labetalol (I), oxprenolol (II), nadolol (II), propranolol (II), timolol (II).

Negative effects on the ability to drive: fatigue, dizziness, vertigo, increased reaction time, impaired concentration, sleep disturbances, mood swings.

It is recommended that patients be warned of the side effects, especially in ophthalmic preparations due to the visual disturbances they may cause.

Central stimulants

Amphetamine (II), amfepramone (I), clobenzorex (I), fenproporex (I), phenylpropanolamine (I), methylphenidate (I), prolintane (I), pemoline (I).

Negative effects on the ability to drive: excitement, euphoria, nervousness, aggressiveness, fatigue, tremors, visual disturbances.

Behavioural changes sometimes result in maladaptive behaviours that may constitute a risk to driving.

Neuroleptics

Phenothiazines: chlorpromazine (III), levomepromazine (III), fluphenazine (II), perphenazine (II), periazin (III),

pipothiazine (III), thioproperazine (III), thioridazine (III), trifluoperazine (III).

Thioxanthenes: flupenthixol (II), zuclopenthixol (II). Butyrophenones: haloperidol (II).

Benzamides: sulpiride (II), tiapride (II).

Others: loxapine (II), clotiapine (II), pimocide (II).

Atypical: clozapine (II), risperidone (II), olanzapine (II), quetiapine (II).

Negative effects on the ability to drive: drowsiness, extrapyramidal effects, orthostatic hypotension, cognitive impairment, visual impairments.

Treatment with neuroleptics is a risk for driving. The absence of treatment in psychotic patients also impairs driving ability, with a higher risk at the start of treatment and when changing dosages.

Hypnotics/anxiolytics

Benzodiazepines (long half-life): bromazepam (III), camazepam (II), clobazam (II), clonazepam (II), chlordiazepoxide (III), diazepam (III), flurazepam (III), flunitrazepam (III), ketazolam (III), nitrazepam (III), barbiturates (III), meprobamate (III).

Benzodiazepines (intermediate-short half-life): alprazolam (III), bentazepam (III), loprazolam (III), lorazepam (III), lormetazepam (III), midazolam (III), oxazepam (III), triazolam (III).

Others: buspirone (II), zolpidem (II), zopiclone (II)

Negative effects on driving ability: drowsiness, impaired reflexes, ataxia, impaired coordination, decreased concentration.

Driving is not recommended in the early hours of treatment or when changing dosage. If a benzodiazepine is prescribed as a hypnotic, we must take into account that the duration of action must be adjusted to the natural sleep period. For use as an anxiolytic, select those with the least effect on the ability to drive. It is important to warn the patient that when combined with alcohol consumption, the sedative action is enhanced.

On 11 October 2007, Royal Decree 1345/2007 was approved, regulating the procedure for the authorisation, registration and conditions of dispensing of industrially manufactured medicines for human use (BOE No. 267, of 7 November). This Royal Decree establishes that medicines that may reduce the ability to drive or operate dangerous machinery must carry the following pictogram on the packaging as a warning to patients.

Driving: see package leaflet

The purpose of the symbol is purely informative for the patient. Furthermore, it should be noted that drug leaflets already contain warnings about the effects that drugs may have on those who drive or operate dangerous machinery.

16.C. Regulatory reference on medication

Special attention shall be paid to dependence, abuse or disorders induced by any type of substance.

Group 1 drivers (non-professional)

In cases where there is regular consumption of medicines that have serious adverse effects on the ability to drive, a driving licence cannot be obtained or renewed.

Abuse, dependence or disorders induced by medicines are not permitted.

Where there is a history of such disorders, rehabilitation must be certified by a favourable report from the specialist treating them.

Group 2 drivers (professional)

In cases where there is regular consumption of medication that has serious adverse effects on the ability to drive, a driving licence may not be obtained or renewed.

Abuse, dependence or disorders induced by medication are not permitted.

In no case may a Group 2 professional driver's licence be obtained or renewed.

The regulation refers to cases in which regular consumption of medication interferes with the driver's behaviour, causing an obvious risk. The driver's behaviour will not depend exclusively on the active ingredient, but also on the illness, the appropriateness of the prescription and the associated risk factors for the driver.

Anti-epileptics require special mention, as their consumption makes it impossible to drive with a professional licence.

16.D.1. Advice for the prescribing doctor

- Always consider whether your patient is a driver before prescribing a drug.
- Use the route of administration that produces the least systemic effects (topical, nasal).
- Sometimes a single night-time dose (retard preparations) with fewer side effects can be used.
- Always bear in mind that the consumption of several drugs may enhance the adverse effects of some of them on driving.
- Do not forget the possibility that your patient may be self-medicating.
- Assess the special sensitivity of elderly drivers, patients with renal failure, diabetics, etc.
- Warn your patient of the risk of driving if they have drunk alcohol.
- Establish a dialogue with your patient to decide together on the safest driving guidelines based on the stage of treatment and the progression of their disease.

• Remind your patient that the first few days of treatment can be the most dangerous.
• With group II and III medications, driving should be avoided during the first week.
• Warn your patient that if they notice any warning signs, such as double or blurred vision, difficulty concentrating, drowsiness, abnormal movements, difficulty remembering how they got to their destination, etc., they should not drive.

16.D.2. Advice for drivers who take medication

• Before driving or operating dangerous machinery, find out how you react to the medication you are taking. If you notice that it affects your reflexes, ability to concentrate, causes drowsiness, etc., tell your doctor and avoid driving.

• Remember that the body's reaction to drugs is most pronounced in the first few days of treatment and especially in the first few hours after taking the drug.

• Always follow the instructions of your doctor and pharmacist on how to use the medication: use it for the duration and in the dosage indicated.

• Never use medication prescribed for others; what may be suitable for them may cause problems for you.

• Never use drugs continuously without the supervision of your doctor and/or pharmacist.

• Remember that taking alcohol and drugs together can increase their adverse effects (increased drowsiness, sedation, loss of reflexes, etc.) and thus have a more negative impact on your ability to drive.

• If you have to drive regularly, remind your doctor. They will try to find the medication that least interferes with your ability to drive.

• Bear in mind that driving under the influence of substances that interfere with your mental and physical condition (alcohol, drugs, certain medications) is a great risk to yourself, your passengers and other drivers.

• If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble for driving while on sick leave.

UNIT 17. OTHER DISORDERS

17.1. Obesity
17.2. Autoimmune diseases

17.1. Obesity

17.1.A. How does it affect the ability to drive?

Obesity has a dual impact on driving. On the one hand, it leads to greater body volume as a result of fat accumulation, especially in cases of central obesity (excessive fat accumulation in the trunk), affecting the ergonomic driving position, the handling of controls, safety systems, etc.

Obesity acts as an agent that exaggerates and aggravates, in the short term and in an obvious way, conditions such as diabetes, hypertension and cardiovascular disorders, which have a significant impact on road safety.

In the case of professional drivers, when the body mass index (BMI) exceeds 40%, it is considered morbid obesity and the driver should be assessed and considered for removal from professional driving.

17.1.B. Effects of treatment on driving

Fat absorption inhibitors can cause severe diarrhoea and, as a result, lead to attention disorders and distractions, giving rise to temporary indispositions that are difficult to control.

Anorectics are drugs that act on the central nervous system, producing a feeling of satiety, and with side effects such as adrenergic stimulation, high blood pressure and other effects similar to those of amphetamine derivatives.

Some antidepressants, such as serotonin reuptake inhibitors used as adjuvants in the treatment of obesity, have adverse effects on the ability to drive.

In addition, we will consider treatments for obesity-related conditions and their possible interactions.

17.1.C. Regulatory reference on obesity.

Group 1 drivers (non-professional) & Group 2 drivers (professional)

Obesity as such is not included in Annex IV of the Regulation on Drivers, so the criteria in section thirteen, 'other unspecified causes,' should be applied, which states that for both groups of drivers (1 and 2),

a driving licence should not be issued or renewed to any person suffering from any illness or deficiency that may constitute a functional disability that compromises road safety when driving, unless the person concerned provides a favourable medical opinion.

The period of validity of the licence will be determined at the discretion of the examining doctor.

In any case, obesity-related conditions that may be considered road safety risk factors will be assessed and, where appropriate, the criteria established for such conditions will be applied.

17.1.D. Advice for drivers with obesity

- If your obesity means that you drive very close to the steering wheel, remember that there should be at least 30 cm between the steering wheel and your body to avoid unwanted injuries from the airbag.
- Use a car with wide seats that can be ergonomically adjusted to your body type.
- If you are a professional driver, consult your doctor about the effects that driving posture may have on conditions frequently associated with obesity (venous return problems, sleep apnoea, respiratory problems, etc.).
- If you are a professional driver, plan your working hours in relation to your eating habits (meal times, food quality and distribution), trying to reduce your body mass and avoiding associated effects (drowsiness, breathing difficulties, etc.).
- Do not drink alcohol if you are going to drive.
- Never use medication prescribed for others; what may be fine for them may cause problems for you.
- Always follow your doctor's instructions regarding diet and medication, and consult your doctor or pharmacist if you have any quest.
- Pay close attention to your doctor's advice regarding the possible side effects of your medication. Avoid driving during the first few days of treatment and when your dosage is changed.
- If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble for driving while on sick leave.

17.2. Autoimmune diseases

These can affect one or more organs or types of tissue. The areas most commonly affected are: the eyes, blood vessels, connective tissue, glands (thyroid or pancreas), joints, muscles, skin, etc.

Each patient may have more than one autoimmune disorder at the same time. The most common include: Addison's disease, dermatomyositis, Graves' disease, Hashimoto's thyroiditis, multiple sclerosis, myasthenia gravis, rheumatoid arthritis, Sjögren's syndrome, systemic lupus erythematosus.

Patients may show a variety of clinical manifestations. In chronic or acute and extreme phases,

these can affect their quality of life and road safety. They include:

- Ocular symptoms: dry eye or red eye, foreign body sensation, itching, photophobia, pain, visual changes and even loss of visual acuity.

- Muscular symptoms that may cause: inflammation (myositis), incapacitating muscle weakness and, sometimes, generalised pain. Weakness typically appears in the shoulders and hips, but can affect muscles symmetrically throughout the body.

In addition to other skin manifestations, with the appearance of blisters or peeling, which, if they appear on the hands or feet, can interfere with the manoeuvrability of the vehicle.

Any of these symptoms during periods of exacerbation can make driving difficult.

17.2.A. How do they affect the ability to drive?

As the manifestations are so varied, they can affect perceptual abilities, with ophthalmological alterations due to uveitis, conjunctivitis, or dry eye, which can cause visual impairment.

They can also affect motor skills, due to motor weakness, which manifests as easy fatigue and frequent joint and muscle pain, preventing prolonged periods of driving.

They can occur in flare-ups that require chronic monitoring with multidisciplinary care, both for the symptoms and the therapies used.

17.2.B. Effects of treatment on driving

Treatment involves various drugs: corticosteroids, non-steroidal anti-inflammatory drugs, immunosuppressants, antimalarials and biological therapies.

The varied progress of these diseases means that, in general, frequent treatment checks are required to assess the desired and undesired effects, as well as to adjust the doses to the stage of development.

17.2.C. Regulatory reference on autoimmune diseases

They are not included in Annex IV of the Regulation on Drivers as a specific section, so the criteria considered in those conditions (sections of the annex) that may present as a manifestation of any of the autoimmune diseases should be applied.

Group 1 drivers (non-professional)

No driving licence or permit shall be issued or renewed to any person suffering from any disease or deficiency that may result in a functional disability that compromises road safety when driving, unless the person concerned provides a favourable medical opinion.

Group 2 drivers (professional)

When they do not prevent the granting or renewal of a licence and the periodic medical examinations to be carried out are for a period shorter than the normal validity of the licence, the period of validity shall be determined according to the medical opinion.

17.2.D. Advice for drivers suffering autoimmune diseases

- With favourable monitoring and prolonged inter-flare periods, which allow you to lead a normal life, it is advisable to avoid stressful traffic situations and prolonged driving periods of more than an hour and a half.

- Adapt your driving habits to changes in your health. Keep in mind that driving in adverse circumstances will require extra effort in terms of attention and concentration.

- Consult your doctor about the undesirable effects that different treatments may cause.

- Whenever there are changes in your treatment (change of medication, dosage or guidelines), avoid driving until you know how you respond to them.

- Do not drink alcohol if you are going to drive. Alcohol can trigger unwanted side effects if consumed at the same time as your prescribed medication.

- If you are on sick leave and you are a professional driver or your job requires you to drive, you should find out whether you could get into legal trouble for driving while on sick leave.

UNIT 18. AGE-RELATED DISORDERS

Older drivers display certain characteristics related, on the one hand, to the physiological process of ageing and, on the other, to age-related morbidity. This means that, in different road environments, they are at greater risk of accidents, although they are not the age group with the highest road risk. Older drivers often find the traffic environment adverse, which explains why they increase their safety by acquiring driving strategies that reduce risk.

18.A. How do they affect the ability to drive?

We will primarily consider the risk arising from:

- *Perceptual deficits (vision and hearing).*
- *Sleep disturbances.*
- *Reduced attention span.*
- *Increased reaction time.*
- *Coordination disturbances.*
- *Decision-making impairments (slow and inaccurate).*
- *Psychological impairments (anxiety, nervousness).*
- *Undesirable effects of treatment.*

The ageing process can affect essential driving abilities, causing:

- *Sensory function impairment (vision and hearing).*
- *Motor difficulties: loss of strength, joint problems.*
- *Impaired coordination and increased reaction time.*
- *Cognitive impairment: memory, orientation, abstract thinking, etc.*
- *Comorbidity: diabetes, depression, hypertension, sleep disturbances, etc.*

With regard to elderly drivers:

- An individual assessment must be carried out, due to the large differences in the driving ability of different people of this age.
- Consider the patient's own judgement and assessment of their ability to drive and perform other activities of daily living.
- Assess the patient's need for independence and autonomy. The vehicle may play an important role in the life of the elderly patient.

The decision to stop driving should be made by the person concerned, gradually, with the valuable opinion of their family and their trusted doctor or nursing staff.

Consider the psychomotor consequences of the ageing process: limited perception of risk, delayed reaction time, imprecise decision-making, problems with attention (divided, sustained, selective), slow manoeuvrability, decreased vitality, etc.

Individual characteristics include several aspects:

- Age.
- General state of health.
- Fatigue.
- Emotional aspects.
- Individual sensitivity.
- Increased risk when several factors concur (treatment with anxiolytics, alcohol consumption and high sensitivity to benzodiazepines).

18.B. Effects of treatment on driving

To consider:

The likelihood of polypharmacy and the associated increase in adverse effects on road safety.

The interaction between alcohol consumption and prescribed drugs.

Neuroleptics, antidepressants, anxiolytics, analgesics, anti-inflammatories, muscle relaxants, hypnotics, antihypertensives and other cardiovascular drugs are the most commonly prescribed drugs for the elderly.

When it is necessary to prescribe any of these therapeutic groups to older people, we should select those with the fewest side effects, in order to avoid, as far as possible, any negative impact on their ability to drive.

Pharmacokinetic differences in older people.

18.C. Regulatory reference

Group 1 drivers (non-professional) & Group 2 drivers (professional).

The regulation does not set an age limit for renewing or obtaining a driving licence, provided that the elderly driver meets the appropriate psychophysical conditions.

18.D. Advice for elderly drivers

- When you go to the doctor, remind them that you drive, so that they can take this into account when deciding on your treatment.
- Consult your doctor about the effects of the medicines you are taking on your driving.
- Avoid using your car if you are feeling unwell, have had a bad night's sleep or your doctor has prescribed a new treatment.
- Consider using public transport for long journeys.
- Avoid rush hours, complicated routes, adverse weather conditions (fog, rain, etc.) and driving at night.

- Take familiar routes, keep the recommended safety distance from the car in front and try to travel with someone else.

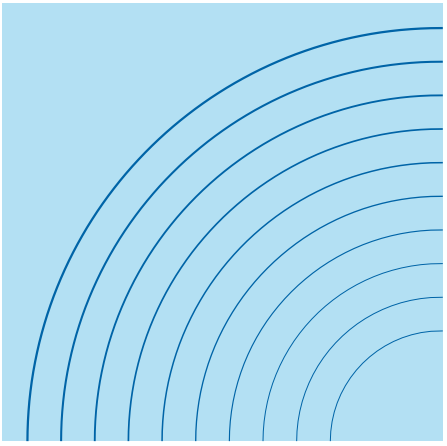
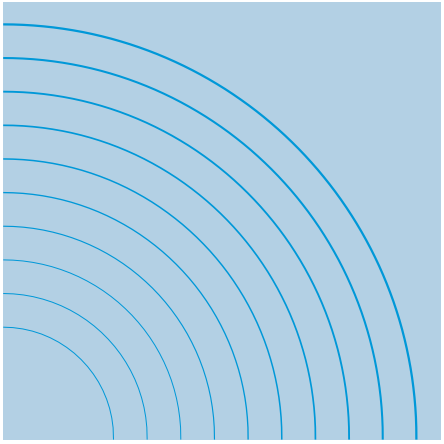
- Always use safety systems (seat belts, headrests) and a helmet if you ride a motorbike/bicycle, adapting them to your needs on each journey.

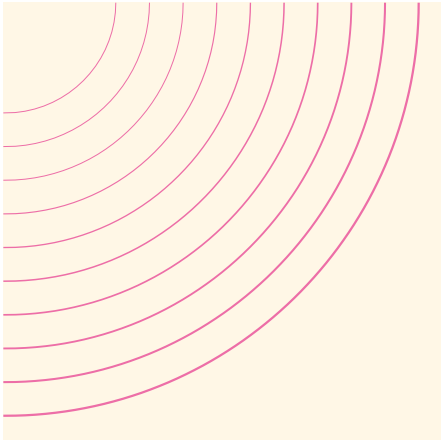
- If you have difficulty moving, cars with power steering, automatic transmission, large pedals, etc., can make driving easier.

- Rear-view mirrors on both sides of the vehicle and a panoramic interior will improve your visibility when manoeuvring that requires you to turn your neck.

- If you need glasses or a hearing aid, have your prescriptions updated regularly to ensure adequate vision and hearing levels when driving.

- Do not drink alcohol if you are going to drive.



UNIT 19. SLEEP DISORDERS

19.1. OBSTRUCTIVE SLEEP APNOEA (OSA) AND OTHER DISORDERS

OSA is one of the sleep disorders with the greatest impact on road safety. It is characterised by repeated episodes of complete (apnoea) or partial (hypopnoea) obstruction of the upper airway due to the soft tissues of the throat collapsing and blocking the airway during sleep.

These obstructions cause a significant reduction in the amount of oxygen available in the blood and multiple unconscious awakenings, resulting in non-restorative sleep, which is the cause of excessive daytime sleepiness and fatigue in these patients.

OSA is a very common disease that affects 4-6% of men and 2-4% of women in middle age, and its frequency increases with age.

OSA has been shown to reduce quality of life and is associated with high blood pressure, cardiovascular and cerebrovascular diseases, which increase the risk of death and contribute to traffic, work and domestic accidents.

For all these reasons, OSA is considered a major public health problem, and in order to solve it, it is necessary to identify patients who are eligible for treatment. However, despite the availability of highly effective treatments, only 5-9% of those affected in Spain are diagnosed and treated.

Consequently, primary care professionals, occupational medicine professionals and Driver Assessment Centres play a key role in identifying individuals with clinically suspected OSA. They may be the first to see these patients and decide to refer them to a specialist.

The key symptoms for suspecting OSA are:

- Interrupted snoring.
- Episodes of breathlessness and respiratory arrest during sleep, observed by those who live with the patient.
- Excessive daytime sleepiness.
- Obesity.
- Thick neck

The typical patient is usually a male over 45 years of age, obese, who has been told for years that he snores, has breathing pauses during sleep, and also reports daytime sleepiness.

OSA is diagnosed and treated in sleep units, where a targeted medical history is taken and the upper airway is examined. An appropriate differential diagnosis must be made, as not all sleep disorders cause daytime sleepiness. According to the International Consensus Document on Obstructive Sleep

Apnoea, cases that have been diagnosed and stabilised with treatment can be managed by primary care, leaving complex and treatment-resistant cases to sleep units.

The gold standard test for establishing a diagnosis of OSA is nocturnal polysomnography (PSG).

Simplified studies that evaluate respiratory and cardiac variables are called respiratory polygraphy (RP) and are an alternative to PSG in many patients. Both tests are complementary and can be performed either in hospital or at the patient's home.

The first treatment should be aimed at reducing the most common risk factors, such as obesity, and aggravating factors such as alcohol, sedative drugs, sleep deprivation and smoking, as well as avoiding sleeping on your back.

Continuous positive airway pressure (CPAP) applied through the nose during sleep is the most important treatment for OSA. This treatment has been shown to be the most effective in suppressing apnoea and hypopnoea, eliminating the symptoms of the disease, normalising sleep quality and preventing potential complications.

Mandibular advancement devices (MADs) increase the space in the upper airway and are an alternative treatment for OSA, generally for non-severe cases and also in patients who cannot tolerate or refuse CPAP.

19.1.A. How do they affect the ability to drive?

Falling asleep at the wheel is one of the leading causes of road risk. In some series, up to 24% of fatal traffic collisions are caused by this, although daytime hypersomnia is not always due to medical causes (9% of the healthy population tends to fall asleep at certain times of the day).

These obstructions cause a significant reduction in available oxygen. OSA is the condition with the strongest evidence of association with road accidents. Up to 52% of patients with OSA admit to having experienced episodes of falling asleep at the wheel. Patients with sleep apnoea have a seven times higher relative risk of traffic accidents than the reference population without apnoea. This risk increases to eleven times when the driver with apnoea drinks alcohol. They are also more likely to suffer accidents at work and at home.

According to the document Drowsiness and Driving. State of the Art Report (2023) in the network of Driver Assessment Centres, medical reports were issued with reference to sleep disorders in 22,410 cases of people with group 1 licences and 2,820 reports of people with group 2 licences, out of a total of 3,908,008 in the case of group and 377,867 in the case of people with group 2 licences

Risk of accidents

The risk of accidents is not only associated with daytime sleepiness, but also with the cognitive impairment that accompanies the disease. It has been shown that proper treatment of OSA reverses the risk of accidents to the reference levels of the healthy population.

In other sleep disorders, such as insomnia, circadian cycle disorders or narcolepsy, an increased risk of traffic accidents has also been found.

The data that must be evaluated to explain road risk in sleep disorders are:

- Morning fatigue, daytime sleepiness and functional alterations of the central nervous system (CNS) cause attention failures, both selective and divided and sustained attention, reduce vigilance, lengthen reaction time and alter movement coordination and psychomotor response.
- Cognitive disorders, although not very obvious, seem to play an important role in the occurrence of errors in road response.
- Primary processes causing drowsiness, such as metabolic, neurological and cardiovascular disorders, drowsiness secondary to medication, etc.
- In certain professional activities, the possible presence of circadian rhythm disorders. This should be explored in shift workers, whose driving habits should be included in their occupational medical history.
- The presence of chronic insomnia causes daytime microsleep, behavioural changes (tension, aggression, risky behaviour) and the possibility of other triggering or consequential processes, such as depression, etc.

19.1.B. Effects of insomnia treatment on driving

The side effects of hypnotic drugs are greater in the early hours, during the first few days and when changing dosages.

Hypnotics should be adjusted to the natural sleep period. It is advisable to prescribe hypnotics with a shorter half-life to drivers to avoid residual drowsiness the following day as far as possible.

Consider the danger of the association between sleep disorders, alcohol consumption and adverse effects of medication.

19.1.C. Regulatory reference on sleep disorders

Patients with obstructive sleep apnoea (OSA), related disorders or other causes of daytime sleepiness must provide a favourable report from a sleep unit stating that they are undergoing treatment and monitoring of daytime symptoms.

Regulatory reference on OSA

Group 1 drivers (non-professional)

The validity period of their driving licence is reduced to a maximum of three years.

Group 2 drivers (professional)

The validity period of their driving licence is reduced to a maximum of one year.

Regulatory reference on other sleep disorders:

Group 1 drivers (non-professional) and Group 2 drivers (professional).

For sleep disorders of non-respiratory origin, such as narcolepsy, non-respiratory daytime hypersomnia (primary or secondary related to another mental disorder, or to medical illness, or induced by substances), circadian rhythm disorders, drug-induced insomnia, when, exceptionally, there is a favourable opinion from a psychiatrist or psychologist in favour of obtaining or extending the licence, the period of validity of the licence may be reduced at the discretion of the examining doctor.

19.1.D. Advice for drivers with sleep disorder

- Obstructive sleep apnoea (OSA) is associated with an increased risk of road accidents. However, if you follow the treatment prescribed by your doctor correctly, the risk of having a road accident will be similar to that of other people.

- Always be aware of the danger of falling asleep while driving, which is associated with fatal injuries.

- If you have any of the following characteristics: snoring, obesity, a thick neck, or feeling tired and sleepy during the day, do not hesitate to consult your doctor about the possibility of having a sleep disorder.

- Driving while drowsy causes vision problems, increased reaction time, reduced attention and coordination, as well as nervousness and anxiety, which can lead to serious road accidents.

- Take extreme precautions when driving at night. The most dangerous hours are between three and six in the morning.

- If you work shifts, respect your sleep schedule. Do not start a long journey without having slept.

- Avoid roads that make you drowsy as much as possible.

- Avoid long journeys, especially when you are under a lot of stress, changing jobs, after strenuous physical activity, or if you are suffering from psychological problems.

- Do not eat heavy meals or drink hot milk if you are going to drive. Instead, chewing gum during the journey may help.

- Natural stimulants (caffeine, theine, etc.) will not remedy sleep deprivation. They may mask it or produce a dangerous rebound effect.

- If you plan to drive, do not consume alcohol or medications with a relaxing or sedative effect.

- When driving: do not adopt a relaxed posture, hold the steering wheel firmly and make frequent stops.

- Direct some of the air vents towards your body or arms. Never drive with the car at a high temperature.

- Self-medication (sedatives-stimulants) to alleviate sleep disturbances is dangerous because it can mask the underlying cause and cause side effects that affect your ability to drive.

- If your doctor has prescribed medication for insomnia, follow their instructions regarding driving. Avoid driving for the first few days and when changing treatments.

- Establish a regular sleep schedule.

- Avoid activities that require mental and/or physical effort, as well as heavy meals, in the hours before bedtime.

- Avoid activities in bed such as watching television, using your mobile phone, playing electronic games, arguing, etc.

- Do not stay in bed longer than necessary.

- Individualise and evaluate naps (they are beneficial for people who work shifts or who do not get enough continuous sleep, but they can interfere with falling asleep in other people).

- Exercise during the day.

- Avoid drinking alcohol 6 hours before going to bed.

- If you are on sick leave and you are a driver or your job requires you to drive, you should find out whether you are breaking any legal obligations by driving during your sick leave.

- Smokers are advised to quit smoking.

19.2. CHRONIC INSOMNIA

Chronic insomnia is defined as difficulty falling asleep or staying asleep due to frequent or early awakenings without being able to fall back asleep during the period of the day planned for sleep (usually at night).

In addition, these situations must occur at least 3 nights per week and be repeated for 3 months. It may be during the day, depending on work obligations.

The Spanish Society of Neurology (SEN) estimates that between 20% and 48% of the adult population suffers at some point from difficulty falling asleep or staying asleep, and that in at least 10% of cases this is due to a chronic sleep disorder. In almost half of the cases, it is associated with symptoms typical of insomnia, such as tiredness, easy fatigability, lack of concentration and limitations in daily activities, both social and occupational. It is more common in older women.

19.2.A. How does it affect the ability to drive?

There is little literature linking chronic insomnia with road accidents. In some accident surveys, insomnia is presented as a risk factor with a higher incidence in serious accidents. Although the road risk of insomnia has been linked to the use of hypnotics (prescribed to improve sleep), there are studies that show a higher probability of having an accident prior to treatment as a result of drowsiness while driving.

The risk of suffering a road accident in people who suffer from chronic insomnia increases if driving becomes monotonous, for example, on motorways for more than 30 minutes, as the likelihood of drowsiness increases.

Chronic insomnia causes daytime microsleep, behavioural changes (stress, aggression, risky behaviour) and the possibility of other triggering or subsequent processes, such as depression, etc.

The influence of chronic insomnia on the ability to drive should be assessed according to its aetiology. The fact that it is included in the regulations on the psychophysical conditions required for driving (Annex IV of the Regulation on Drivers in the section on mental and behavioural disorders (item 10.6)) is understood when determining the origin of insomnia and its association with the risk of the pathology that may generate it as a manifestation of the same (taken from the Alianza por el Sueño report, 2024):

- *Chronic insomnia in adaptive disorders*
- *Chronic insomnia in the context of anxiety and depression*
- *Chronic insomnia associated with psychiatric comorbidity*
- *Chronic insomnia due to substance abuse*
- *Chronic insomnia in adult women (premenopause and menopause)*
- *Chronic insomnia associated with chronic pain*
- *Chronic insomnia associated with ageing*

19.2.B. Effects of insomnia treatment on driving

The side effects of hypnotic drugs are greater in the early hours, during the first few days and when changing dosages.

Hypnotics should be adjusted to the natural sleep period. It is advisable to prescribe hypnotics with a shorter half-life to drivers to avoid residual drowsiness the following day as far as possible. Consider the danger of the association between sleep disorders, alcohol consumption and adverse effects of medication.

19.2.C. Regulatory reference on sleep disorders: insomnia

Insomnia is included in Annex IV of the Regulation on Drivers under the section on mental and behavioural disorders, specifically in item 10.6 Sleep disorders of non-respiratory origin.

Group 1 drivers (non-professional) & Group 2 drivers (professional)

Cases of narcolepsy or non-respiratory daytime hypersomnia disorders, whether primary, related to another mental disorder, medical condition or substance-induced, are not permitted. Other circadian rhythm disorders that pose a risk to driving are also not permitted. In cases of insomnia, special attention shall be paid to the risks associated with the possible use of medication.

19.2.D. Advice for drivers with chronic insomnia

- Always be aware of the danger of falling asleep while driving, as this is associated with fatal injuries.

- If you have difficulty falling asleep, feel tired, fatigued, irritable, aggressive, etc., do not hesitate to consult your doctor about the possibility of a sleep disorder.

- It is advisable to gradually reduce the consumption of hypnotics and other drugs used in the treatment of insomnia. Behavioural therapies have greater beneficial effects.

- Driving while drowsy causes vision problems, increased reaction time, reduced attention and coordination, as well as nervousness and anxiety, which can lead to serious road accidents.

- Take extreme precautions when driving at night. The most dangerous hours are between three and six in the morning.

- If you work shifts, respect your sleep schedule. Do not start a long journey without having slept.

- If possible, avoid roads that cause drowsiness due to the monotony of driving.

- Avoid long journeys, especially when you are under a lot of stress, changing jobs, after strenuous physical activity, or if you are suffering from psychological problems.

- Do not eat heavy meals or drink hot milk if you are going to drive.

- Natural stimulants (caffeine, theine, etc.) will not remedy sleep deprivation. They may mask it or produce a dangerous rebound effect.

- If you plan to drive, do not drink alcohol or take any relaxing or sedative medication.

- Self-medication (sedative-stimulant) to alleviate sleep disorders is dangerous because it can mask the underlying cause and cause side effects that affect your ability to drive.

- If your doctor has prescribed medication for insomnia, follow their instructions regarding driving. Avoid driving for the first few days and when changing treatment.

- It is advisable to establish a regular sleep routine.

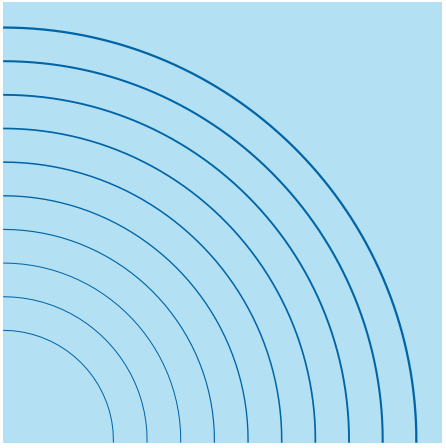
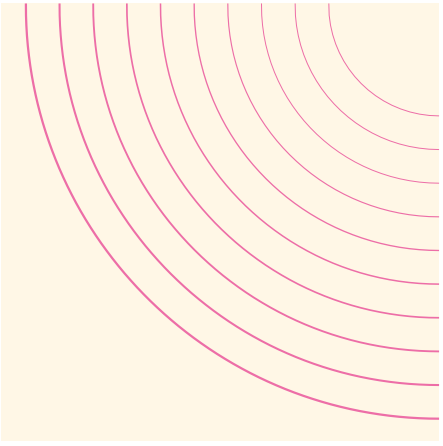
- In the hours before going to bed, you should avoid activities that require mental and/or physical effort, as well as heavy meals.

- Avoid activities in bed such as watching television, using your mobile phone, playing electronic games, arguing, etc.

- It is advisable to consider individually the value of taking naps (they are beneficial for people who work shifting hours or who do not get enough sleep on a regular basis). However, they can interfere with falling asleep for people with irregular sleeping habits.

- Exercising during the day will help you feel the need to rest at night.

- You should avoid drinking alcoholic beverages before going to bed.


UNIT 20. USEFULNESS OF PASSIVE SAFETY SYSTEMS

Passive safety systems are those features designed to prevent injuries caused by a collision. They differ from active safety systems in that they intervene at an earlier stage, i.e. they try to prevent the crash.
Injuries in the event of a collision occur as a result of a sudden change in the speed to which the occupant is exposed, the time elapsed and, as a result of this relationship, the final deceleration.

20.A. What are passive safety systems?

The following features can be considered passive safety systems:

- *Passenger compartment*
- *Seat belt*
- *Headrest*
- *Airbag*
- *Helmet (two-wheeled vehicles)*

The passenger compartment is essential, as it provides a survival space for the driver and passengers. Its functions are:

- *Absorb impact energy (deformable structures)*
- *Protect occupants (rigid structures)*

However, this passenger compartment is of little use if, in the event of an impact, the occupants are unrestrained inside it, as they would continue to travel at the same speed as the vehicle at the moment of impact. To prevent the injuries that would be caused by such movement inside the vehicle, there are seat belts, head restraints and airbags, as well as other secondary elements that seek to minimise the consequences, such as dashboard padding, deformable steering wheels, laminated glass, retractable steering columns, etc. Of all these, the first three (seat belts, head restraints and airbags) constitute a basic trio of prevention measures and can even interact as a single system.

20.C. Regulatory reference on passive safety systems. Spanish Highway Code

Section 117. Approved seat belts and child restraint systems.

1. Drivers and passengers in vehicles are required to wear approved seat belts, properly fastened, when travelling on both urban and interurban roads. This requirement does not apply to vehicles that do not have seat belts installed.

In any case, minors who are 135 centimetres tall or shorter must use child restraint systems and be seated in the vehicle in accordance with the provisions of the following sections.

Section 118. Helmets and other protective equipment.

1. Drivers and passengers of motorcycles or motorcycles with sidecars, three-wheeled vehicles and quadricycles, mopeds and special quad-type vehicles must wear approved or certified protective helmets in accordance with current legislation when travelling on both urban and interurban roads.

When motorcycles, three-wheeled vehicles or quadricycles and mopeds have self-protection structures and are equipped with seat belts, and this is stated on the corresponding technical inspection card or moped characteristics certificate, their drivers and passengers shall be exempt from wearing protective helmets, but they shall be required to use the aforementioned seat belts when travelling on both urban and interurban roads.

2. The installation of headrests or other protective features in any vehicle shall be subject to compliance with the conditions laid down in the vehicle regulations.

Section 119. Exemptions.

1. Notwithstanding the provisions of Section 117, the following persons may drive without wearing seat belts or other approved restraint systems:

a) Drivers when reversing or parking.
b) Persons with a certificate of exemption for serious medical reasons or persons with disabilities. This certificate must be presented when requested by any traffic enforcement officer.

Any certificate of this type issued by the competent authority of a Member State of the European Union shall be valid in Spain accompanied by its official translation.

2. The exemption shall also apply when driving in built-up areas, but in no case when driving on motorways, dual carriageways or conventional roads, to:

a) Taxi drivers when on duty. Likewise, when driving in traffic or urban areas of large cities, they may transport persons whose height is less than 135 centimetres without using an approved restraint device adapted to their size and weight, provided that they sit in the back seat.
b) Goods distributors, when carrying out successive loading and unloading operations in places located a short distance from each other.
c) Drivers and passengers of emergency service vehicles.
d) People accompanying a learner or trainee driver during driving lessons or tests who are in charge of the additional controls of the car and are responsible for road safety.

3. Individuals with a certificate of exemption for serious medical reasons, issued in accordance with the provisions of paragraph 1.b) above, shall be exempt from the provisions of Section 118.1. This certificate must state its period of validity and be signed by a registered practising medical professional. It must also bear or incorporate the symbol established by current regulations.

20.D. Advice for drivers on passive safety systems

The efficiency of restraint systems depends on their correct use, as they are complementary and each one is activated according to the type of accident.

Passenger compartment

Both rigid and deformable structures are designed to absorb impact energy and create a safety space for vehicle occupants, so they must be in perfect condition.

Seat belt

This is the fundamental feature of passive safety, designed to keep occupants in their seats and prevent them from being ejected from the vehicle.

The three-point seat belt is characterised by:

Blocking the release of the strap (belt).

Pyrotechnic pretensioning, which tightens the strap at the moment of impact, thus preventing slack between the body and the belt, working in conjunction with the airbag.

Load limitation, which is provided, on the one hand, by the elasticity of the strap (polyamide) itself and, on the other hand, by a system that detects when the force exerted by the seat belt on the chest or pelvis reaches certain values, allowing the strap to extend.

- The belt must be positioned correctly to avoid injury:

  - The diagonal strap should pass through the centre of the collarbone (between the shoulder and the neck). The horizontal strap should go under the abdomen, in contact with a more resistant part of the pelvis called the iliac crest (the highest point of the pelvis).

  - Avoid driving with a coat, a cushion on your back or a clip on your seatbelt.

  - The backrest angle should be between 100-110º.

  - If you are under 150 cm tall, you should consult a specialist to see if it would be advisable to adapt your vehicle.

  - It is essential and mandatory that all occupants of the vehicle wear a seat belt. Remember that between 5% and 10% of fatal injuries suffered by front seat occupants were caused by rear seat occupants who were not wearing seat belts.

Airbag

It mainly protects the head and torso (not restrained by the seat belt) and also covers a larger area than the seat belt to restrain the entire body of the occupant.

It complements the seat belt and does not replace it under any circumstances.

There are several types depending on their purpose:

- Front: maximum effectiveness in frontal impact (volume of 60 litres for the driver and greater, around 120 litres, for the passenger).
- Side: maximum effectiveness in side impacts (volume between 10 and 20 litres).
- Side curtain: protects the head in side impacts (volume of 15 to 30 litres).
- Knee: protects the knees in a frontal impact (volume of 15 litres).

- Do not drive close to the steering wheel; there should be at least 30 cm between the steering wheel and the driver.

- Do not place objects on the dashboard, as they may interfere with the proper functioning of the airbag and cause injury.

- Check the airbag sensors annually and in the event of impacts in which they have not been activated (the approximate expiry date of the airbag is ten years).

Seat and headrest

The seat must allow for control and prevent the occupant's body from moving. The structure under the seat is of particular importance, as it prevents the occupant from sliding under the seatbelt (submarine effect), helping to restrain the pelvis (complementing the function of the lap belt).

- The headrest is essential for preventing whiplash.

- Always check that the headrest is properly positioned. To do this, remember that:

  - The distance between the headrest and the head should never be more than 9 cm (maximum effectiveness at 6 cm).
  - As a rule, the height of the headrest should be such that the centre of the headrest is at eye level.

Helmets and other passive safety features for motorcyclists

- Always wear a helmet, which should be full-face and approved.

- Clothing should protect against falls and friction, with materials such as Kevlar being the most appropriate.

- Airbag vests are effective in impacts at 30-40 km/h, reducing injuries to the chest and spine.

- Gloves should be suitable for riding motorcycles, preventing injuries to the hands, which are usually the first to take the impact.

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