



Current ophthalmological norms for drivers – how does Poland compare with other countries?

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ABSTRACT

To drive a car it is necessary to demonstrate both relevant technical skills and knowledge as well as adequate health, especially of the eyes. The correct criteria of visual parameters for drivers are approved by the Minister of Health in Poland. In the past five years, medical guidelines for applicants and drivers have changed three times. First of all, attempts were made to adapt national regulations to the recommendations of the European Union. This paper is an attempt to answer to what extent this plan has been implemented. The article presents the minimum ophthalmological criteria currently applicable in Poland to drivers and candidates for drivers. It was based on the guidelines contained in the current Ordinance of the Minister of Health dated August 30th, 2019 on medical examinations of applicants

for a driving licence and drivers. The results were compared with the latest recommendations of the European Union updated on July 22nd 2018. Standards in several major European countries (Germany, France, the UK, Italy, Spain, Switzerland) as well as examples of US states (California, New York, Florida, Texas, Illinois, DC) and other global powers were also analysed (Japan, Canada, Australia, Israel, India, Mexico). The most important functions of the eye were examined, including visual acuity, visual field, color vision, binocular vision, glare sensitivity, mesopic vision and contrast sensitivity. The results are collected in the appropriate tables.

KEY WORDS: driving licence, visual acuity, visual field, binocular vision.

INTRODUCTION

Wilhelm II Hohenzollern, the last German Emperor and King of Prussia, famously said “The automobile is no more than a transitory phenomenon. I do believe in the horse”. He was mistaken. Cars have become an object of common use rather than a fleeting fad. Driving a car is fast and comfortable, and after internal border controls within the European Union were lifted, countries that seemed far away became easier to reach. We tend to travel more, and over longer distances. We clock up hundreds or even thousands of kilometers behind the wheel. However, to do this, we must meet certain health conditions, especially with regard to the organ of vision. The development of fair minimum requirements with regard to the visual standards that must be met by drivers in order to be able to drive safely on the road has been an age-old dilemma [1, 2]. Each country has its own specific requirements applicable to drivers [3]. In Poland, the issue is regulated by the Ordinance of the Minister of Health of 30 August 2019 on the medical examinations of applicants for a driving licence and drivers (Polish Journal of Laws 2019, item 1659) [4]. Since one of the priorities of the European

Union (EU) was to harmonize the laws of the Member States, an attempt was made to develop joint recommendations in a number of areas. One of them is transport – including road transport. In order to systematize the driving licence regulations in different EU Member States, on 20 December 2006, the European Parliament and the Council of the European Union adopted Directive 2006/126/EC [5].

DISCUSSION

In Poland, the ophthalmic examination in applicants for a driving licence should include:

- detailed ocular history (prior eye diseases, injuries, surgical procedures; wearing glasses or contact lenses),
- visual acuity with and without correction,
- binocular visual acuity after correction,
- visual field,
- color vision,
- binocular vision.

In justified cases, additional ophthalmic examinations may be required, including:

- mesopic vision,

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Table I. Ophthalmic criteria applicable in Poland to candidates for drivers and drivers with driving licence category AM, A1, A2, A, B1, B, B+E, T

	Ophthalmic criteria
Persons	Applying for or holding a driving licence of category AM, A1, A2, A, B1, B, B+E, T
Visual acuity	At least 0.5 with both eyes after correction
Type of visual correction	No limitations: glasses, contact lenses or intraocular lenses, provided there is good tolerance of the visual correction device and adaptation to correction
Color vision	Not required
Visual field	At least 120° with both eyes; the extension should be at least 50° left and right, and 20° up and down; no defects should be present within 20° from the fixation point (in individuals with glaucoma or retinal degenerative changes, a perimetric examination is required; in other cases, an examination using the confrontation method is sufficient)
Binocular vision	If monocular vision is detected, no contraindications to driving can be determined, subject to the following conditions: – the corrected visual acuity in the seeing eye is at least 0.5 – the visual field of the seeing eye is at least 120°; the extension is at least 50° left and right, and 20° up and down; no defects are present within 20° from the fixation point (in individuals with glaucoma or retinal degenerative changes, a perimetric examination is required; in other cases, an examination using the confrontation method is sufficient) – at least 6 months have passed since the onset of monocular vision or diplopia
Mesopic vision	Not required (evaluated in individuals with implanted intraocular lenses, after laser vision correction surgery or for other reasons relating to medical examination)
Glare sensitivity	Not required (evaluated in individuals with implanted intraocular lenses, after laser vision correction surgery or for other reasons relating to medical examination)
Contrast sensitivity	Not required (evaluated in individuals with implanted intraocular lenses, after laser vision correction surgery or for other reasons relating to medical examination, with the stipulation that the absence of abnormalities in mesopic vision test is considered equivalent to a correct result of contrast sensitivity test)

- glare sensitivity,
- contrast sensitivity.

Annex 2 to the Ordinance of the Minister of Health of 29 August 2019 on the medical examinations of applicants for a driving licence and drivers (Polish Journal of Laws 2019, item 1659) precisely defines the ophthalmic standards in this area [4].

Detailed ophthalmologic criteria related to licensed drivers and applicants for driving licences are listed in Tables I and II (for different driving licence categories).

In the European Union, all matters relating to driving licences are set out in detail by Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving licences (with subsequent amendments, the latest adopted on 22 July 2018). Annex III of the Directive contains a precise specification of the minimum standards of physical and mental fitness for driving power-driven vehicles [5]. Detailed ophthalmic parameters recommended by the EU for licensed drivers and applicants for driving licences are presented in Tables III and IV.

It is important to note that the EU does not impose unified health requirements applicable without exception to licensed drivers and applicants for driving licences across the EU's Member States. What is more, section 5 of the above-mentioned Annex provides that the standards set by Member States for the issue or any subsequent renewal of driving licences may be stricter than those set out in the Annex [5]. In view of the above, I have collected in Table V the legal vision requirements in force in the largest EU countries (Germany, France, Italy and Spain), in the United Kingdom, which was

an EU Member State until 31 January 2020, and in Switzerland [3, 6-8].

How does Poland compare against the largest European powers in this field? It must be stressed that the ophthalmic examination which is mandatory in applicants for driving licences in Poland is very detailed. In addition to visual acuity, visual field and binocular vision tests, a color vision test is also required, and in justified cases mesopic vision and glare sensitivity are additionally evaluated [4]. In most EU countries (Poland included), the required binocular visual acuity for category A and B vehicle drivers is 0.5 on the Snellen eye charts [3, 4, 6, 7]. Only Italy deviates significantly from this value, requiring full visual acuity in the better eye [3]. Globally considered, this is quite unique, with only Turkey having such strict regulations [9]. It is interesting to note that the UK has a dual standard of visual acuity assessment. Drivers must be able to read a number plate from a distance of 20 meters or, a more professional option, have a binocular visual acuity of at least 6/12 [7, 10]. In addition, it is worth noting that under the EU recommendations it is common for Member States to allow individuals with monocular vision to apply for a category A and B driving licence [3-7]. Poland has also implemented these guidelines by enacting the Ordinance of the Ministry of Health of 23 December 2015 [11]. Before that, normal binocular vision was a mandatory requirement for drivers of category A vehicles [12].

Currently, cars are a popular means of transport at all latitudes, but each country individually determines the minimum visual requirements for drivers [3, 9, 13]. The requirements in place in six selected US states, as well as in Canada,

Table II. Ophthalmic criteria applicable in Poland to candidates for drivers and drivers with driving licence category C1, C1+E, C, C+E, D1, D1+E, D, D+E, permission to drive a tram, privileged vehicle or transporting monetary values as well as driving techniques instructors and making road transport or working as drivers

	Ophthalmic criteria
Persons	<ul style="list-style-type: none"> – Applying for or holding a driving licence of category C1, C1+E, C, C+E, D1, D1+E, D, D+E, tram driving permit – Applying for a permit or renewal of a permit to drive emergency vehicles or vehicles transporting money and/or valuables – Subject to examinations under Art. 39j(1) or Art. 39m of the Road Transport Act (providing road transport services or performing work as drivers) – Listed in Art. 34(1) (providing international road transport services) or Art. 117(4) (driving instructors) of the Road Transport Act
Visual acuity	<ul style="list-style-type: none"> – At least 0.8 with both eyes after correction – At least 0.8 for the better eye and at least 0.1 for the worse eye after correction
Type of visual correction	<ul style="list-style-type: none"> – No limitations: glasses, contact lenses or intraocular lenses, provided there is good tolerance of the visual correction device and adaptation to correction – Maximum permitted correction ± 8.0 D
Color vision	Correct ability to identify red, green, and yellow
Visual field	At least 160° with both eyes; the extension should be at least 70° left and right, and 30° up and down; no defects should be present within 30° from the fixation point.
Binocular vision	In cases involving a sudden and substantial loss of vision in one eye the absence of contraindications to driving can be ascertained, subject to the following conditions: <ul style="list-style-type: none"> – at least 6 months have passed since the substantial loss of vision in one eye – an ophthalmologist's opinion confirming the person's adaptation must be submitted Diplopia is a contraindication to driving the above-mentioned types of motor vehicles
Mesopic vision	Normal
Glare sensitivity	Normal
Contrast sensitivity	The absence of deviations in mesopic vision test is tantamount to the correct result of contrast sensitivity test

Table III. Ophthalmic criteria recommended by European Union to candidates for drivers and drivers with driving license category AM, A1, A2, A, B1, B, BE

	Ophthalmic criteria
Persons	Applying for or holding a driving licence of category AM, A1, A2, A, B1, B, BE
Visual acuity	At least 0.5 with both eyes after correction
Type of visual correction	No limitations: glasses, contact lenses or intraocular lenses. When a progressive eye disease is detected or declared, driving licences may be issued or renewed subject to the applicant undergoing a regular examination performed by a competent medical authority
Color vision	Not required
Visual field	Horizontally at least 120° with both eyes; the extension should be at least 50° left and right, and 20° up and down; no defects should be present within 20° from the fixation point
Binocular vision	If monocular vision is detected, no contraindications to driving can be determined, subject to the following conditions: <ul style="list-style-type: none"> – the corrected visual acuity in the seeing eye is at least 0.5 – the visual field of the seeing eye is at least 120°; the extension is at least 50° left and right, and 20° up and down; no defects are present within 20° from the fixation point – an ophthalmologist's opinion confirming the person's adaptation to monocular vision must be submitted – a certain adaptation period (e.g. 6 months) has passed since the substantial loss of vision in one eye
Mesopic vision	Not required (but may be requested as an auxiliary visual test in individuals who may be potentially eligible for a driving licence despite not meeting the visual acuity criterion)
Glare sensitivity	Not required (but may be requested as an auxiliary visual test in individuals who may be potentially eligible for a driving licence despite not meeting the visual acuity criterion)
Contrast sensitivity	Not required (but may be requested as an auxiliary visual test in individuals who may be potentially eligible for a driving licence despite not meeting the visual acuity criterion)

Japan, Australia, Israel, Mexico and India, are summarized in Tables VI and VII.

In the United States, there are no federal recommendations applicable to drivers akin to the EU regulations. Each

US state has its own requirements for drivers [3, 13]. Most commonly, the minimum visual acuity should be 20/40 (0.5 decimal), though in some states it may be lower, subject to meeting additional requirements. A visual field test

Table IV. Ophthalmic criteria recommended by European Union to candidates for drivers and drivers with driving license category C1, C1E, C, CE, D1, D1E, D, DE

	Ophthalmic criteria
Persons	Applying for or holding a driving licence of category C1, C1E, C, CE, D1, D1E, D, DE
Visual acuity	At least 0.8 for the better eye and at least 0.1 for the worse eye after correction
Type of visual correction	– No limitations: glasses, contact lenses or intraocular lenses, provided there is good tolerance of the visual correction device – Maximum permitted correction ± 8.0 D
Color vision	Not required
Visual field	Horizontally at least 160° with both eyes; the extension should be at least 70° left and right, and 30° up and down; no defects should be present within 30° from the fixation point
Binocular vision	In cases involving a sudden and substantial loss of vision in one eye the absence of contraindications to driving can be ascertained, subject to the following conditions: – an ophthalmologist's opinion confirming the person's adaptation to monocular vision must be submitted – a certain adaptation period (e.g. 6 months) has passed since the substantial loss of vision in one eye Diplopia is a contraindication to driving the above-mentioned types of motor vehicles
Mesopic vision	Not required
Glare sensitivity	Not required
Contrast sensitivity	Normal

Table V. Ophthalmic criteria applicable in selected European countries to candidates for drivers and drivers with driving license category AM, A1, A2, A, B1, B, BE

Country	Visual acuity	Visual field	Binocular vision	Other
Germany	Better eye ≥ 0.5 Weaker eye ≥ 0.2	Horizontally $\geq 120^\circ$ No defects present within central 30°	In monocular individuals the better eye ≥ 0.6	
France	≥ 0.5 with both eyes	To the right $\geq 60^\circ$ To the left $\geq 60^\circ$ Up $\geq 30^\circ$ Down $\geq 30^\circ$	In monocular individuals the better eye ≥ 0.6	Mesopic vision test required
Italy	1.0 with both eyes Weaker eye ≥ 0.2	Normal ($\geq 120^\circ$ horizontally is sufficient)		Correct ability to identify red, green, and yellow Mesopic vision test required
Spain	≥ 0.5 with both eyes	Normal	In monocular individuals as an exception if the better eye ≥ 0.6	
UK	≥ 0.5 with both eyes or ability to read a number plate from 20 meters	Horizontally $\geq 120^\circ$ To the right $\geq 50^\circ$ To the left $\geq 50^\circ$ No defects present within central 20°	In monocular individuals, correct visual field and documented adaptation to monocular vision are required	
Switzerland	≥ 0.63 with both eyes	Horizontally $\geq 140^\circ$	In monocular individuals the better eye ≥ 0.8	Diplopia not allowed

Table VI. Ophthalmic criteria applicable in selected US states to candidates for drivers and drivers with driving license category B

US states	Visual acuity	Visual field	Binocular vision	Other
District of Columbia (DC)	Better eye ≥ 0.5 Weaker eye ≥ 0.3	Horizontally $\geq 130^\circ$		Correct ability to identify red, green and yellow in applicants for driving licences
Florida	Better eye ≥ 0.5 Weaker eye ≥ 0.1	Horizontally $\geq 130^\circ$		
Illinois	≥ 0.5 with both eyes	$\geq 140^\circ$ with both eyes $\geq 105^\circ$ with one eye		
California	Better eye ≥ 0.5 Weaker eye ≥ 0.3	Not required		
New York	Better eye ≥ 0.5	Horizontally $\geq 140^\circ$		
Texas	≥ 0.5 with both eyes	Not required	In monocular individuals the better eye ≥ 0.8	Correct ability to identify red, green and yellow in applicants for driving licences

is not mandatory in every US state, one such example being California. Normal color perception may be required in some states (Texas, DC), but only in applicants for a driving licence [3, 13]. It is important to note that there are considerable differences in the minimum visual acuity requirements applicable to drivers across the world's major countries, ranging from 6/18 in India to 20/50 (0.4 decimal) in Canada and 0.7 in Japan, an even 20/25 (0.8 decimal) in Mexico [9, 13]. Substantially less variation is seen in the requirements for visual field. Typically, the horizontal visual field should be at least 120°, though in Japan it must be wider, at least 150° [13].

CONCLUSIONS

The minimum legal visual requirements for drivers which are currently in place in Poland are set out in the Ordinance of the Minister of Health of 30 August 2019 on the medical examinations of applicants for a driving licence and drivers, and are aligned closely with the recommendations of the European Union laid down in the latest amendment to Directive 2006/126/EC of the European Parliament and of the Council on driving licences. With few exceptions, the requirements applicable to drivers in other European coun-

Table VII. Ophthalmic criteria applicable in selected non-European countries to candidates for drivers and drivers with driving licence category B

Country	Visual acuity	Visual field
Australia	≥ 0.5 with both eyes	Horizontally ≥ 120°
India	≥ 0.33 with both eyes	Not required
Israel	≥ 0.5 with both eyes	Horizontally ≥ 120°
Japan	≥ 0.7 with both eyes Weaker eye ≥ 0.3	Horizontally ≥ 150°
Canada	≥ 0.4 with both eyes	Horizontally ≥ 120°
Mexico	≥ 0.8 with both eyes	

tries are similar to those in force in Poland, which is directly related to the current EU recommendations. However, considerable variation can be observed across other countries of the world, which may be due to different prevailing cultural traditions.

DISCLOSURE

The author declares no conflict of interest.

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