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Driving and glaucoma in the UK: a national survey of clinicians' advice and guidance to patients

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INTRODUCTION: Driving standards policy is set by the Department for Transport and executed by the Driving and Vehicle Licensing Agency (DVLA). Professional bodies recognise the challenges that clinicians face when advising patients with glaucoma about driving. This study explored clinicians' knowledge and confidence around driving standards and their approach to advising and guiding patients.

METHODS: Cross-sectional online survey of all United Kingdom and Eire Glaucoma Society (UKEGS) members. The survey remained open for five weeks (22/02/21–27/03/21). Anonymised data were exported to Microsoft Excel for analysis.

RESULTS: Out of 91 respondents (minimum response rate 20.2%), 53 (58.2%) were glaucoma consultants, 2 (2.2%) general consultant ophthalmologists, 4 (4.4%) ophthalmology fellows, 5 (5.5%) ophthalmology trainees, 19 (20.9%) optometrists, and 8 (8.8%) 'other' categories (one SAS doctor, six specialist doctors, one nurse specialist). 58.2% reported that the visual standards for driving were 'very familiar'; 40.5% were 'moderately familiar'; one(1.2%) was only 'somewhat familiar'; none were completely unfamiliar. A total of 38 (41.8%) respondents were highly confident in giving advice on fitness to drive; 51 (56.0%) were moderately confident; 2 (2.2%) had only limited confidence. Over 25% review patients not meeting driving standards in every glaucoma clinic, over 50% identifying abnormal visual fields as the main reason.

CONCLUSION: Our study found that most clinicians are familiar with DVLA driving standards. However, busy clinical environments limit detailed discussion about this, leading to only one in four clinicians being very confident to broach the subject with patients in clinic. A range of patient education modalities were suggested, which may help simplify advice provision for glaucoma patients.

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INTRODUCTION

Glaucoma can affect both central and peripheral vision. As a result, clinicians may need to discuss visual standards for driving with patients and any specific limitations that might be problematic relating to ability to drive with glaucoma. Driving standards policy per se is set by the Department for Transport and executed by the Driving and Vehicle Licensing Agency (DVLA). In its 'Ophthalmic Services Guidance on Vision Standards for Driving', the Royal College of Ophthalmologists (RCOphth) recognises that some parts of DVLA guidance are not statutory and are often considered by professionals to be unclear, difficult to interpret, and subjective [1]. According to recent guidelines issued by the General Optical Council (GOC), primary care optometrists are advised to ensure that the DVLA is informed about patients not meeting the driving standards [2]; however, the potential for 'grey areas' allows for interpretation of standards based on unique medical circumstances of individual patients, rather than upon imposition of static, inflexible, generalised rules.

For patients diagnosed with bilateral glaucoma, DVLA advice is relatively straightforward with clinicians asked to direct patients to inform the DVLA about their condition [2]. However, the actual DVLA visual requirements for driving comprise a combination of visual acuity measures and binocular visual field criteria which vary according to different driving groups. Routine clinical examinations do not involve estimation of binocular visual acuity nor testing of the binocular visual field up to 120 degrees. Based on a combination of available monocular test results (measured in clinical rather than driving-specific settings) and a knowledge of the above-mentioned DVLA standards, clinicians make a professional judgement about whether a patient meets the standards, and thereafter whether the patient is advised to inform the DVLA.

There are several limitations to making a professional judgement about a patient's suitability to drive and providing appropriate advice to patients, yet there is a paucity of information about how clinicians approach the issue in glaucoma and/or other ophthalmic clinics. Arguably clinicians may have concerns discussing this sensitive issue with their patients, based upon the clinical evidence available, and subsequently in directing patients to inform the DVLA of their condition and/or potentially advising them to stop driving. The purpose of this study was to investigate the knowledge and confidence of clinicians in interpreting and advising on vision standards for driving, and to explore their approach to managing this issue in clinic.

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METHODS

A cross-sectional online survey was distributed via email to all members of the United Kingdom and Eire Glaucoma Society (UKEGS) using Survey Monkey® online software. The survey remained open for five weeks from 22nd February to 27th March 2021. At the start of the survey, individuals not involved in patient care within their practice were excluded by a filtering question. Qualifying participants were subsequently asked specific questions regarding their individual practices when advising their patients on vision and driving.

Identification of relevant issues with face validity was established through inter-clinician discussion following informal review of the vision and driving literature and the professional guidance offered to clinicians [3]. The questionnaire was structured into four main domains, namely: Respondents' Professional Background and Responsibilities; Knowledge of DVLA standards; Familiarity with Legal Requirements; and Quality of Patient Education. General questionnaire design principles were adhered to using neutrally worded questions and Likert scales for response classification where appropriate [4]. In being mindful to reduce response burden and to encourage a reasonable response rate we finalised the survey to a 14-item questionnaire. The exact survey questions are included in Appendix 1. Pre-survey piloting amongst clinicians at Manchester Royal Eye hospital suggested the final version could be completed in ~5 min.

RESULTS

Professional background and responsibilities

The survey was distributed to 450 UKEGS contacts via email. A total of 91 respondents (reflecting a minimum response rate of 20.2%) attempted the survey. Of these, 53 (58.2%) were consultant ophthalmologists with a special interest in glaucoma, 19 were optometrists (11 specialist optometrists, four principal optometrists and four consultant optometrists), seven were associate specialists, five were ophthalmology trainees, four were clinical fellows, two were general consultant ophthalmologists and one was a glaucoma specialist nurse. Six respondents (five consultant ophthalmologists with a special interest in glaucoma and one glaucoma specialist nurse) were immediately excluded from the analysis since they stated they did not have responsibility in advising patients on visual standards for driving and did not answer any further questions in the survey. Of the remaining 85 respondents declaring having this responsibility, 82 answered all further questions whereas three (two consultant ophthalmologists with a special interest in glaucoma and one clinical fellow) did not complete subsequent survey questions.

A total of 37 (43.5%) respondents stated they were "highly confident" in giving advice on fitness to drive, with 46 (54.1%) being "moderately confident" and 2 (2.4%) having "limited confidence" to do so. None stated that they had "no confidence at all" in advising on fitness to drive. Secondary analysis showed 27 of the 48 (56.3%) consultant glaucoma specialists who responded to this question felt "highly confident" with 20 (41.6%) "moderately" and only one stating they had "limited" confidence.

Knowledge of DVLA standards

In total, 84 participants responded to the six questions on DVLA visual standards for driving, of whom 49 (58.3%) reported being 'very familiar' with these, whilst 34 (40.5%) were 'moderately familiar' and one (1.2%) 'somewhat familiar'; none responded as being completely unfamiliar with the standards. Thirty out of the 48 consultant ophthalmologists with glaucoma sub-specialist interest were 'very familiar' with the standards with the remaining 18 stating they were 'moderately familiar'.

Forty-four participants (52.4%) stated that they "always" enquired about their patient's driving status, with 40 (47.6%) stating they did "sometimes", and none doing so "rarely or never". A total of 23 (27.4%) respondents stated they always enquired about whether their patient's job involved operating vehicles, with 52 (61.9%) reporting they asked sometimes, 8 (9.5%) rarely and one (1.2%) never doing so.

In total, 22 clinicians (26.2%) reported encountering patients who do not meet the standards in every clinic, 53 (63.1%) reported seeing these only in *some clinics* and the remaining nine (10.7%) only rarely. Of the 22 clinicians seeing such patients in *every* clinic, 16 were consultant ophthalmologists, four were ophthalmology trainees and 2 were ophthalmology fellows.

In all, 16 respondents (19.1%) "frequently" advise patients not to drive as they do not meet the standards, with 56 (66.7%) reporting that they do so "sometimes", 11 (13.1%) "rarely" and one respondent (1.2%) "never" doing so.

Forty-four (52.4%) respondents stated that "not meeting the minimum standards for visual fields" is the most common reason for advising glaucoma patients not to drive. Twenty respondents (23.8%) believe that patients "not meeting the minimum standards for visual acuity is the most common reason" whereas 16 respondents (19.1%) reported that their "patients not meeting both visual acuity and visual field standards" was the most common reason for advising them not to drive.

Familiarity with legal requirements

A total of 82 respondents answered the question on how often they record fitness to drive in patients' notes if it has been discussed: 51 (62.2%) stated that they "always" record this, with 27 (32.9%) and 4 (4.9%) reporting that they "usually" or "rarely" do so respectively; none reported that they "never" record driving status in patients' notes.

Seventy-five participants answered the question 'Which of the following are reasons why you don't broach the subject of fitness to drive?' Of particular note is that 27 respondents stated it was due to "lack of time in busy clinics", with 9 clinicians reporting it was "out of fear of angering patients or losing their trust" (5 out of 9 being consultant ophthalmologists) and a further nine reporting "fears of miscommunication due to the virtual nature of the review" (3 out of 9 being consultant ophthalmologists). Only one respondent (a general ophthalmology consultant) reported a "lack of knowledge of standards" as a reason, with three more (two being ophthalmology trainees) reporting a "lack of confidence on how to approach the topic". Nineteen respondents specifically reported they always broach the subject.

A total of 82 participants responded to the question 'What do you do if a patient meets the visual acuity standard, but the visual field is not reliable or if they can't do a visual field test?'. Nineteen respondents (23.2%) stated they would order an Esterman visual field test to allow offering further advice whilst another six (7 .3%) said they would perform Goldmann visual fields to facilitate offering better advice. Eighteen respondents (22.0%) reported that they would arrange for the DVLA to be informed and fourteen participants (17.1%) reported they would specifically ask patients to inform the DVLA and arrange for a further test with the DVLA. Thirteen respondents (15.9%) more specifically qualified their reply by stating they would arrange for the DVLA to be informed if there was corroborative clinical evidence of a debarring defect, with another respondent (1.2%) answering that they would refer to the DVLA if other clinical evidence showed an advanced defect. Four (4.9%) stated they will not be able to advise patients about driving, and one responder (1.2%) reported they would not be able to advise patients and therefore not take further action.

Patient Educators

81 participants responded to this section in total. The question 'What advice do you give to your patients regarding driving standards?' was asked. A total of 66 (81.5%) reported they "make their patients aware of the legal cut off point for driving vision standards", with 56 (69.2%) advising patients to "wear distance spectacles to meet driving standards", 31 (38.3%) advising patients to "check regularly their ability to read a number plate at 20 metres", and 51 (63.0%) recommending patients "should have regular sight tests". Four respondents specifically reported they

Table 1. Participants' responses when asked to rate six potential options by which patients might be educated regarding their vision and the driving standards.

	Good idea	Reasonable idea	Poor idea	Bad idea
One-one discussion	47 (58.8%)	24 (30.0%)	9 (11.3%)	0 (0.0%)
Letter to the patient	29 (37.7%)	38 (49.4%)	10 (13.0%)	0 (0.0%)
Demonstrating the driving standards in the clinic e.g., number plate test	32 (40.0%)	32 (40.0%)	16 (20.0%)	0 (0.0%)
Engaging with family members/friends in the discussion	42 (52.5%)	29 (36.3%)	9 (11.3%)	0 (0.0%)
Vision and driving leaflet	64 (80.0%)	15 (18.8%)	1 (1.3%)	0 (0.0%)
Referring to the DVLA website	44 (55.0%)	26 (32.5%)	10 (12.5%)	0 (0.0%)

would advise patients to contact the DVLA directly regarding driving standards. Participants were then asked to rate six potential options by which patients might be educated regarding their vision and the standards (see Table 1).

DISCUSSION

The DVLA's stated mission is to ensure best practices for licensing drivers and vehicles within the UK to promote road safety and environmental sustainability, while pursuing integrity, excellence, professionalism, and reliability in service delivery [5]. In addition, the DVLA is keen for stakeholders to actively participate in informing the DVLA about driving concerns. However, a GOC survey of primary care optometrists suggested 72% of registrants would not feel comfortable informing the DVLA if their patients would not do so themselves [6]. Furthermore, ~56% of those in the GOC's survey considered it would be difficult to balance patient confidentiality and public safety, and 83% believed the current system of medical fitness does not adequately protect the public. However, while the GOC's survey was targeted essentially at primary care, and in the context of sight testing attendances, there is a paucity of such insights for secondary care in the literature. Our survey aimed at assessing predominantly secondary care clinicians' knowledge of standards, and their confidence and approach in advising patients on eligibility to drive with glaucoma. Hence, we targeted the UKEGS membership which predominantly encompasses both clinical ophthalmologists *and* optometrists involved in secondary glaucoma care.

One limitation of our survey was the minimum response rate of 20.2%, partly due to some potential for duplication of email addresses but also due to some of the membership including non-clinical researchers and scientists. Although the conclusions are based on a relatively small sample size, the fact that responders comprised more than one fifth of the whole UKEGS membership arguably reflects the breadth of clinicians working in glaucoma clinics in the UK Hospital Eye Service (HES), with 56.5% being consultant ophthalmologists with special interest in glaucoma and 22.4% being optometrists involved in glaucoma care. A second limitation was the potential for questionnaire interpretation impacting responses; however, this is inherent in all surveys and we attempted to mitigate against this by pre-survey pilot testing as described above.

The survey showed that more than a quarter of respondents (26.2%) see glaucoma patients who do not meet driving standards criteria in every clinic. All 22 participants in this group were ophthalmologists (none was an optometrist) which may reflect glaucoma complexity and disease stages being reviewed in their clinics. Nearly 90% of respondents fell either into this group or those who encounter such patients regularly, with only just over 10% stating that they rarely do so. This finding may reflect both case complexity, (including multiple ocular pathology e.g. age-related macular degeneration, cataract), and age-related factors (including non-ocular factors such as cognitive and/or physical disabilities related to other conditions, e.g. stroke, dementia). In all cases however, the survey results highlight the need for clear guidelines and strategies for dealing with these patients, emphasising the importance of enquiring about driving status at each visit.

Forty-four participants (52.4%) stated that they *always* enquired about their patient's driving status, with 40 (47.6%) saying they did sometimes, and none doing so rarely or never. These findings may represent an admission that clinicians sometimes forget to ask about driving status, although it could also reflect a pragmatic approach by already knowing or assuming that the patient does not drive, for various evident reasons. Only 12% of patients with glaucoma lose their licence in the UK [7]. This figure appears to be comparatively lower than other countries, with a study from the Wilmer Eye Institute in Baltimore showing 23% of a glaucoma patient cohort had ceased driving over a two-year period [8]. One must also bear in mind that some patients might depend on driving for their livelihood, including the necessity for a Type 2 licence with stricter criteria. In our survey, only about a quarter (27.4%) of respondents stated they always enquire about whether their patients' job involved operating vehicles, with 52 (61.9%) asking sometimes, 8 (9.5%) rarely and 1 (1.2%) never doing so.

The DVLA requires that a patient must be able to read a number plate outside at 20 metres [9]. This requirement can make advising patients on DVLA requirements based on available clinical evidence quite complex. Asking patients to inform the DVLA based only on a visual acuity (VA) cutoff is an available option for clinicians. However, a person can read a number plate with uncorrected vision ranging from 6/36 to ≤6/6 Snellen, but with the specificity to read a number plate improving to 100% only when VA is 6/7.5 [10]. A specificity of 62% to see the number plate is achieved with reduced contrast visual acuity of 6/12 Snellen [11]. In glaucoma, where patients may also have visual field loss impacting on central vision and/or contrast sensitivity) it is not clear who is likely to be able to read a number plate with different levels of VA as recorded in clinic. Knowing the limitations of interpreting VA measurements in glaucoma patients specifically is one factor that may improve advice provision, especially in meeting current driving standards. Interestingly, less than a quarter of participants (23.8%) considered visual acuity was the primary reason for advising patients not to drive, with over half (52.4%) stating that not meeting a minimum standard for visual fields (VF) is the main reason.

Interpretation of both VA and VF results can be challenging, particularly if the patient has a general health condition and/or an ocular comorbidity which may influence driving. Additionally, there can be differences in decision making between clinicians in interpreting clinical data. When referred for a DVLA assessment, about 90% of glaucoma patients pass the Esterman visual field test (EVFT). Additionally, in those who fail the test (for example when the fail is possibly due to poor instructions), about 62% could pass the visual field standard if they appeal and take the test again [12]. Such uncertainty in detecting true DVLA pass test results further challenges clinicians in providing suitable advice. When asked specifically about what course of action clinicians would take if a patient met the VA standard but the VF was not reliable or could not be done, 23.2% indicated that they would order an EVFT to give patients better advice, with a further 7.3% stating they would

perform Goldmann visual fields and advise on available evidence. This finding means that ~30% of respondents showed a tendency to order a different type of visual field test to verify results or give some meaningful interpretation of patients' safety to drive based on standards. However, these alternative tests are not specifically mentioned in the DVLA advice for clinicians, making it unclear how they would help, particularly if guidelines still recommend referral to the DVLA without specific 'cutoff' points for these additional tests. Not surprisingly, over 50% of respondents (45/82) stated they would directly ask patients to inform the DVLA and/or arrange further tests with a DVLA approved test site (rather than organise further tests themselves), particularly if there would be corroborative clinical evidence there is a debarring defect. A further five clinicians simply stated that they would just not be able to advise the patient about driving in such circumstances. These actions are unsurprising, as the DVLA could over-rule clinicians' decisions and also there is no formal feedback or acknowledgment about the DVLA's decision unless elicited from or offered by the patient. A clinician could theoretically argue about public safety based on key clinical findings but deciding on safety is much more complex when we consider several other vision factors (contrast, glare or twilight zone), individuals' reaction time and cognitive status amongst others. The evidence for each of these factors affecting road safety is incomplete and hard to research because prospective trials may be inappropriate, and observational studies are limited to drivers satisfying current guidance, so the range of visual performance is narrowed, thus decreasing the power of studies. Driving simulator experiments are limited by induced nausea, and also unrealistic driving adaptations. Information collected by police using the STATS19 form about an accident includes vision factors and the details collected can extensively be used for research work and guidance in road safety [13]. However, data protection legislation prevents correlation of road accident data with medical records so potentially valuable information from day-to-day accident occurrence is not presently accessible.

Sachdev et al. have shown a lack in the documentation of patients' driving status and advice given, suggesting the need to develop a more robust process, if their findings represented the general trend in eye clinics across the UK [14]. Their prospective observational study found only 50% of patients in two separate sub-specialist glaucoma clinics had previous documentation of driving status; 24 out of 133 glaucoma patients interviewed were drivers with bilateral glaucomatous visual field defects, thus meeting the criteria for informing the DVLA; less than half of these (11/24) had their driving status documented and just over 50% (13/24) had been advised to inform the DVLA, with only a single patient having had documentation this advice was provided. In our survey, 44 participants (52.4%) stated they *always* enquired about their patient's driving status, with the remaining 40 (47.6%) saying that they did sometimes. None stated they never or rarely do so. Interestingly however, only 51 respondents (62.2%) confirmed they would always record this information if it had been assessed, with a further 27 (32.9%) reporting they would usually but not always record this information. The "Fitness to Drive" DVLA guidance: Part 6c, specifically states that clinicians should make a note of any advice given to a patient about their fitness to drive in their medical record, and this is a practice that we strongly endorse and recommend [15].

An important question asked in our survey explored reasons for not broaching with patients the subject of fitness to drive. Only a quarter of respondents specifically reported they always broach the subject with no issues. The commonest reason given (36%) for not doing so was the "lack of time in busy clinics". A further 12% expressed fear of miscommunication due to the virtual nature of their clinic reviews whilst another 12% reported that it was due to fear of angering patients or losing trust. Most respondents in the latter two scenarios were consultant ophthalmologists. About 5% considered it is not their responsibility to broach the subject, attributing this responsibility to patients and/or the DVLA. A small number (4%) also described a lack of confidence on how to approach the topic. It has been widely reported in literature that a busy clinical setting leads to communication errors [16], but as a small proportion of our cohort demonstrated, a lack of confidence could also be a reason for not broaching the subject. We believe that this finding highlights a need for specific clinician education on how and when to broach the subject, which in itself could lead to an improvement in both patient and public safety. The General Medical Council has issued specific guidance on dealing with circumstance where patients may not wish to accept advice being given [17]. Ultimately doctors may need to break confidence and inform the DVLA directly where patients whose eyesight is unequivocally below the standard are determined to continue driving and are resistant to advice and guidance. The guidance states that it is preferable for doctors to be open and straightforward with a resistant patient and first to try hard to persuade, but if direct communication to the DVLA is thought necessary, patients should be told that this action will be taken, and ideally copied into the correspondence.

In conclusion, this study found that most clinicians are familiar with driving standards set by DVLA although busy clinical environments limit clinicians from having a detailed discussion about visual standards for driving, leading to only one in four clinicians being very confident to broach the subject of fitness to drive. Many different patient education modalities were suggested, which could help simplify advice for patients. Education to clinicians to improve the consistency with which advice is offered may be beneficial. Further questions not explored in our survey should arguably become matters for future consideration, for example, how technological advances, such as the diagnosis and monitoring of glaucoma via imaging rather than visual fields and the advent of self-driving cars [18], may influence further the complexities faced by clinicians when advising patients about driving.

Summary

What was known before

- Driving standards policy is set by the Department for Transport and executed by the Driving and Vehicle Licensing Agency (DVLA).
- Clinicians have responsibility to give suitable advice to patients regarding driving standards and guiding the patients to inform DVLA based on clinical evidence.
- Clinicians have a choice of using different driving advice options such as one-one discussion, involving family, leaflets, demonstrating driving standards and letter to the GP.

What this study adds

- Busy clinical environments could be limiting clinicians from having appropriate discussions about driving vision standards although most of the clinicians are familiar with the driving standards set by DVLA.
- Only one in four clinicians are very confident to broach issues on the subject of fitness to drive.
- Patient leaflets seem to be the preferred option for educating patients on this topic. One-one discussion and involving family members in discussion about driving vision standards are other approaches preferred by majority of the clinicians to educate patients.

DATA AVAILABILITY

Data available on request

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AUTHOR CONTRIBUTIONS

KM planned the study, designed the questionnaire, collected, compiled and analysed the data, prepared the paper and critically reviewed the manuscript. BP collected and compiled the data, critically reviewed and contributed for content of the questionnaire and the paper. RAH planned the study, designed the questionnaire, critically reviewed the manuscript and contributed for the content of the questionnaire and the paper. SS planned the study, designed the questionnaire, contributed for initial draft of the paper, critically reviewed the manuscript and contributed for the content of the questionnaire and the paper.

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COMPETING INTERESTS

The authors declare no competing interests.

APPENDIX

Domain 1: Professional background and responsibilities

- What best described your training?
- Do you have responsibility in advising patients about driving standards in your clinic?
- How confident are you with giving advice on fitness to drive?

Domain 2: Knowledge of DVLA standards

- Are you familiar with the DVLA standards of vision for driving?
- How often do you enquire about your patient's driving status?
- How often do you enquire about whether your patient's job involves operating vehicles?
- How often do you see patients with glaucoma who do not meet the driving standards criteria?
- In your usual clinical practice, how frequently do you believe you have advised patients not to drive?
- What do you believe is the most common reason you have advised patients not to drive?

Domain 3: Familiarity with legal requirements

- How often do you record fitness to drive in a patient's notes if it has been discussed?
- Which of the following are reasons why you don't broach the subject of fitness to drive? Please tick all that apply.
- What do you do if a patient meets the visual acuity standard, but the visual field is not reliable, or if they can't do a visual field test?

Domain 4: Quality of patient education

- What advice do you give to your patients regarding driving standards? Please tick all that apply
- How would you rate the following options as a way to educate patients regarding driving standards?

ADDITIONAL INFORMATION