Optometry in Practice 2017 Volume 18 Issue 4 177 – 186

Dementia and optometry: a growing need

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EV-46479 C-58234

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Introduction

The demographics of the UK population have changed significantly in the last four to five decades, with the most notable changes being increased life expectancy resulting in an ageing population. As a result of this progressively ageing population, there is an increasing prevalence of dementia. The prevalence of dementia increases dramatically with advancing age; for example, it rises from 1.7% of people aged between 65 and 69 years to affect more than 40% of people over the age of 95 years (Prince et al. 2014). It has been estimated that the total number of people in the UK with some form of dementia ranges from 670 000 (Matthews et al. 2013) to 835 000 (Prince et al. 2014). One million people in the UK are predicted to have dementia by 2025, a figure that is likely to rise to over 2 million by 2051 (Alzheimer's Society 2017). Although the prevalence of dementia is higher in the elderly population, dementia is not exclusively a disease of older people, and there are approximately 42 000 people in the UK younger than 65 years who have this condition (Alzheimer's Society 2017).

Figure 1 illustrates how the most rapid UK population growth is in people aged 85 years and over, often referred to as the 'oldest old'. Between 1985 and 2010 the percentage of the population aged 85 and over increased from 1% to 2%, with the numbers aged 85 and over more than doubling from nearly 0.7 million to reach over 1.4 million by 2010. By 2035 it is projected that the number of people aged 85 and over will be almost 2.5 times larger than in 2010, reaching 3.5 million and accounting for 5% of the total UK population. In comparison, the population growth in the over-65-year-olds is more modest, predicted to increase by approximately 50% between 1985 and 2035.

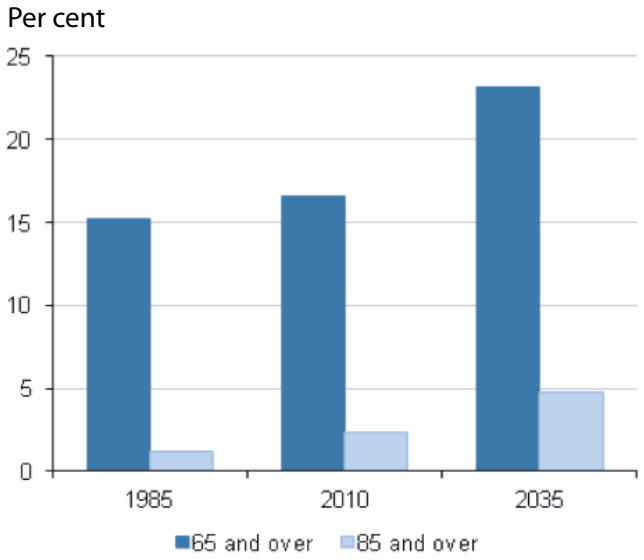

Figure 1. How the proportion of the UK population aged 65 years and older and 85 years and older has changed and is predicted to change over five decades between 1985 and 2035.

Dementia is defined as 'a major degenerative disorder with evidence of substantial cognitive decline from a previous level of performance in one or more domains such as short-term memory, abstract thinking, judgment, language, and personality changes sufficiently severe to interfere with independence' (American Psychiatric Association 2013). Rather than a single symptom or sign, the term dementia describes a set of symptoms/signs that may include memory loss, impaired reasoning, language, communication, judgement and loss of coordination. There are many different types of dementia, with Alzheimer's disease being the most common and well known. Other main types include vascular dementia and dementia with Lewy bodies (DLB). Figure 2 illustrates the relative frequency of the main forms of dementia, based on data from *Dementia UK: Update* (Prince et al. 2014).

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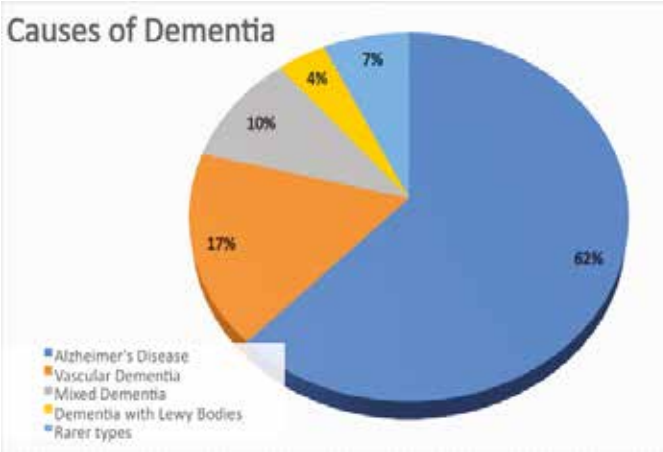

Figure 2. Relative frequency of the main types of dementia in the UK. Data from Prince et al. (2014).

Alzheimer's disease, which is a progressive condition, currently affects more than 520 000 people in the UK. During the course of the disease, proteins build up in the brain to form structures called amyloid plaques and neurofibrillary tangles. This leads to the loss of connections between nerve cells, and eventually to nerve cell death and loss of brain tissue.

Vascular dementia is the second most common type of dementia, affecting around 150 000 people in the UK. In vascular dementia, symptoms of memory loss and difficulties with thinking, problem solving or language occur when the brain is damaged as a result of impaired blood supply.

Dementia with Lewy bodies is a type of dementia that shares symptoms with both Alzheimer's disease and Parkinson's disease. In addition to problems with attention and alertness, patients with DLB frequently experience visual hallucinations (seeing things that are not there), usually in the early stages of the condition. Visual hallucinations can occur daily, last several minutes and can be very distressing for the patient as they are detailed and convincing to the person with dementia. Finally, mixed dementia is a combination of Alzheimer's disease and vascular dementia.

Optometrists frequently encounter patients with dementia during primary care eye examinations conducted in both practice and domiciliary settings, and in the hospital eye service. Providing domiciliary eye care to people with dementia, either in their own homes or in care homes, is becoming an increasingly important aspect of community eye care. Approximately two-thirds of people with dementia live in private households and the remaining one-third live in some form of institutional care setting (Matthews et al. 2013). Many older people with sight loss live in care homes and there is some evidence that they are subject to a disproportionately high burden of visual loss, with an estimated 30% of those who are visually impaired in the UK living in care homes (Evans and Wormald 2011).

An estimated 1.87 million people live with sight loss in the UK. Approximately 360 000 are registered as sight-impaired or severely sight-impaired (Access Economics 2009). Ninety per cent of new cases of permanent sight loss in the UK in 2016–2017 occurred in people aged 65 years or older (Deloitte Access Economics 2017). Age-related macular degeneration is by far the main cause of registrable visual impairment (VI) (sight-impaired or severely sight-impaired) in the adult UK population (Bunce and Wormald 2006). Other major causes are diabetic eye disease and glaucoma (Jonas et al. 2017). However, an estimated 1.64 million of those in the UK with sight loss have mild or moderate loss, much of which is correctable (RNIB 2013). The main causes of correctable visual loss are cataract and uncorrected or undercorrected refractive error (Evans and Rowlands 2004; Evans and Wormald 2011).

Dementia and sight loss develop independently, but both dementia and the major causes of sight loss are age-related. Therefore, with our progressively ageing population there is an increased risk of developing dementia and having serious sight loss concurrently (RNIB and Age UK 2015), resulting in an increased demand for eye care, which frequently is provided in a domiciliary setting. In 2015–2016, 3.3% of NHS sight tests were domiciliary examinations, conducted in the individual's place of residence or at a day centre (Health and Social Care Information Centre 2016). Anyone eligible for an NHS sight test qualifies for a domiciliary sight test if they are unable to attend a high-street practice unaccompanied due to a physical or mental illness or disability (Optical Confederation 2015).

The number of domiciliary sight tests has risen steadily over the last 10 years, from around 310 000 in 2006–2007 to over 430 000 in 2015–2016, an increase of approximately 40% compared with a decade earlier. This increase could be attributed to the ageing UK population, with older people seeking eye examinations in their own home, although there is no direct evidence to support this (Health and Social Care Information Centre 2016).

Visual problems in dementia

Visual problems in dementia include loss of visual acuity, defects in colour vision, changes in pupillary response to mydriatics, defects in fixation and smooth and saccadic eye movements, changes in contrast sensitivity function and visual evoked potentials and disturbance of complex visual functions such as reading ability, visuospatial function and the naming and identification of objects. Detailed discussion of these and other visual deficits that can occur in dementia, which is beyond the scope of this article, can be found in the excellent and well-referenced review article by Armstrong and Kergoat (2015).

These problems may affect different aspects of visual performance and reduced contrast sensitivity, impaired motion detection, impaired stereopsis and difficulty recognising faces, objects and colour can result in the person with dementia experiencing difficulties with orientation. As a consequence, people with dementia experience symptoms such as bumping into things, getting lost in familiar

surroundings and misinterpreting reflections. One potentially disturbing phenomenon, which can occur when viewing themselves in a mirror, is that people with dementia may not recognise themselves at all (Chandra and Issac 2014) or see a much younger version of themselves.

Optometrists working in both primary and secondary care will often examine people with dementia before a formal diagnosis has been made. This is due in part to visually related symptoms, such as difficulty in reading, not recognising familiar objects and spatiotemporal disorientation, which may develop early on in people with dementia (Cogan 1985; Mendez et al. 1990), leading them to consult an optometrist in the first instance rather than their GP (Armstrong and Kergoat 2015). Studies investigating sight loss and dementia have revealed shared changes in nervous system physiology and suggest that the prevalence of sight loss in people with dementia is higher than that in the general population of older people without dementia (Jones and Martin 2007).

The Prevalence of Visual Impairment in people with Dementia (PrOVIDe) study

Although VI and dementia often coexist, until recently there has been little UK prevalence data on VI among people with dementia. The PrOVIDe study was a large-scale England-wide study undertaken by a multidisciplinary team led by the College of Optometrists and funded by the National Institute for Health Research.

The study was carried out in two stages. In stage 1, a total of 708 people with dementia, aged 60–89 years, underwent a domiciliary sight test complying with General Ophthalmic Services requirements and professional guidelines. The sample included people living in their own homes (n = 389) or in care homes (n = 319). In stage 2 qualitative data were collected from 119 participants using interviews with people with dementia, and interviews and focus groups with family carers, professional care workers and optometrists. The study findings have been published in full by the National Institute for Health Research (Bowen et al. 2016).

The key objectives of the PrOVIDe study were to measure the prevalence of eye conditions causing VI in people with dementia and to identify and/or describe reasons for underdetection or inappropriate management of these conditions. A total of 708 participants with dementia had domiciliary eye examinations conducted by a team of research optometrists from The Outside Clinic who were experienced in examining people with dementia. The optometrists were able to perform an eye examination, although not necessarily a full eye examination, on all participants living in their own homes (group 1: n = 389, median age = 80 years) and most of the participants living in care homes (group 2: n = 319, median age = 83 years). Optometrists were unable to perform any part of the eye examination on eight participants, all of whom lived in care homes. All participants had their level of cognitive impairment assessed with a frequently used and validated test, the standardised Mini Mental State Examination (sMMSE). This allowed the researchers to identify any significant correlations between the ability of participants to complete various elements of the eye examination and their level of cognitive impairment.

A variety of definitions of VI have been used in prevalence studies. All of these definitions use criteria for VI based on levels of visual acuity (VA) as recorded on Snellen progression VA charts. The two cut-off points most commonly used to define VI in terms of VA are: (1) VA <6/12 Snellen (0.32 logMAR equivalent) (National Eye Institute 2017) and (2) VA <6/18 Snellen (0.48 logMAR equivalent) (Department of Health 2017).

The prevalence of visual impairment

For the PrOVIDe study VI was subdivided into:

- Presenting VI: participants were visually impaired whilst wearing their current distance spectacles or unaided if no spectacles were worn for distance vision.
- Postrefraction (or best-corrected) VI: the participant was visually impaired whilst wearing the prescription determined by the PrOVIDe optometrist.
- Uncorrected or undercorrected VI: these participants had presenting VI but were not visually impaired when wearing the prescription determined by the PrOVIDe optometrist.

When looking at the effects of the participants' place of residence, the prevalence of VI of all three types described above was approximately 2–2½ times more common for those participants living in care homes compared to those living in their own homes. It could be argued that this difference could be attributed to care home residents being older and more cognitively impaired than those living in their own homes. However, after controlling statistically for age, gender and level of cognitive impairment (sMMSE score), the prevalence of uncorrected or undercorrected VI was still found to be statistically significantly greater for those participants living in care homes. Full prevalence data can be found in the published PrOVIDe report (Bowen et al. 2016).

For those participants in whom we found postrefraction VI, one single cause for VI was identified for each participant. Cataract was the primary cause of almost 50% of VI with VA <6/12 and is potentially remediable with cataract surgery. Age-related macular degeneration was the primary cause of VI in approximately one-third of participants with VA <6/12. For VA <6/18, these proportions were reversed, with age-related macular degeneration being the cause of VI in almost 50% of cases and cataract the cause in approximately one-third of cases.

A secondary objective of the study was to determine the proportions of the sample who were able to complete key elements of a routine eye examination. These results are shown in Table 1. Most key tests were possible in over 80% of participants. Participants who were unable to complete the key tests were significantly more likely to live in care homes and were significantly more cognitively impaired.

Table 1. Table showing the ability to carry out key elements of the eye examination in people with dementia

	Percentage able to carry out test		
Eye examination element	**Full sample**	**Group 1 (own home)**	**Group 2 (care home)**
Objective assessment of refractive error	88.1%	92.0%	83.4%
Subjective assessment of refractive error	80.9%	95.1%	63.6%
Visual acuity measurement	83.2%	97.4%	65.8%
Tonometry	94.8%	99.2%	89.3%
Fundus examination	91.2%	97.4%	83.7%

One, perhaps surprising, finding that emerged from the PrOVIDe study focus groups and interviews was that virtually all of the study participants living at home, and their carers, were unaware that domiciliary sight tests were available to people unable to attend an optometric practice unaccompanied. We have previously made recommendations for a dementia eye care pathway (DECP) (Hancock et al. 2015); however this pathway has not yet been adopted. One recommendation was that, when a diagnosis of dementia was made by a GP or old-age psychiatrist, the individual and carer(s) should receive written information regarding the importance of regular eye examinations, a measure which should reduce the prevalence of VI in people with dementia and the considerable impact of VI on an individual's quality of life. It was recommended that part of the core information provided through the DECP should be information about how to access a domiciliary service if required.

Although our DECP recommendations have not been adopted, the College of Optometrists' *Guidance for Professional Practice* (College of Optometrists 2014a) states that 'If you do not offer a domiciliary service you, or your practice, should make information available about where patients can access these services'. Providing this information is particularly important for patients with dementia or cognitive impairment as they may be unable to attend an optometric practice unaccompanied.

The eye examination and dementia

Becoming a Dementia Friend

The Dementia Friends programme (www.dementiafriends.org.uk) is an Alzheimer's Society initiative run by the Alzheimer's Society and Public Health England. It is the biggest ever initiative to transform people's perceptions of dementia and aims to educate the public on what it is like to live with dementia, on ways in which one can help and support those living with dementia and how to 'make a difference'. Anyone can become a Dementia Friend by watching a short online video or by attending a face-to-face information session. There are currently over 2 million Dementia Friends. With the current ageing population and with approximately one in six people over the age of 80 currently being affected by dementia, optometrists and practice staff will benefit from this additional training to help them confidently support those dementia patients and their carers who attend their practice.

In addition, there is scope to become a Dementia Friends Champion – a volunteer who encourages others to make a positive difference to people living with dementia in their community. Dementia Friends Champions can attend an induction, receive support as required and be part of a group of volunteers creating a dementia-friendly community. The overall objective of Dementia Friends is to build a dementia-friendly society, and optometry has a role to play here by creating more dementia-friendly practices which are sympathetic to the needs of people with dementia and their carers.

Improve expertise in examining people with dementia

The College of Optometrists' updated *Guidance for Professional Practice* has a section 'Examining patients with dementia or other acquired cognitive impairment'. This contains very valuable advice for practitioners (College of Optometrists 2014b). The sections on 'The domiciliary eye examination' and 'Consent' are particularly relevant to eye examinations on people with dementia (College of Optometrists 2014c, d). The College of Optometrists has a recommended reading list for improving expertise in this field and has included 'Dementia and the eye examination' and an 'Optometry and dementia lecture video' in its online learning section on dementia.

Optometrists who took part in the focus groups held as part of the PrOVIDe study felt that the best and quickest way to gain expertise in examining patients with dementia was to shadow another optometrist who is experienced in examining dementia patients (Bowen et al. 2016).

Prepare for the appointment

Raising awareness amongst colleagues within the practice setting, ideally with colleagues becoming Dementia Friends, would ensure that appropriate preparations are made for the optimal examination of a patient with dementia. Provided the practice staff are made aware that the patient has dementia when the appointment is made, they can advise

the optometrist regarding the patient's cognitive impairment prior to the examination taking place. This avoids the all too common occurrence of the optometrist not realising that the patient has dementia until some point during the examination. When the appointment is made, it is important to bear in mind factors such as the best time of day for the patient (both in a practice or domiciliary setting), whether the patient is likely to need additional time for the examination and whether any special arrangements are required when the patient attends. It is worth discussing with patient and/or carer whether the patient may benefit from an examination in a domiciliary setting as they may not be aware of this option.

Involve carer/care worker

Optometrists in focus groups in the PrOVIDe study found it beneficial to involve an informed carer at all stages of the examination. If the practice is made aware at the time of arranging the appointment that the patient has dementia, the optometrist can speak with the carer to establish the patient's level of cognitive impairment, cooperation and ability to consent before the appointment.

Having an informed carer present during the examination provides reassurance to the patient. Using data gathered from the PrOVIDe study, the presence or absence of a carer was analysed for its contribution to successful or unsuccessful completion of five key elements of the eye examination. These were objective assessment of refractive error, subjective assessment of refractive error, VA measurement, fundus examination by ophthalmoscopy and tonometry. This analysis concluded that the presence of a carer was associated with a statistically significant positive impact on the ability of the participant to complete VA measurement successfully. For the other four tests, the impact of the carer was also positive but failed to reach statistical significance. It is important to establish how well the carer knows the patient at the outset because it is possible that the professional carer attending the eye examination may not be very familiar with the patient's case. The optometrist should record the name of the carer who was present during the examination on the patient's record card.

Patience and communication

Patients with moderate or severe cognitive impairment often take time to understand and process the questions they are asked and the information that is being given to them. When communicating with patients with dementia, it is important to slow down and perform the eye examination at the pace that is appropriate for the patient, so that patients can follow and respond to what is being required of them. The College of Optometrists' guidance for professional practice, in the section on 'Communicating with patients effectively' (College of Optometrists 2014e), states that optometrists should communicate with patients in a way that they can understand. Additionally, irrespective of their level of cognitive impairment, mental capacity and ability to consent, it is important to include patients in all discussions and decisions about their management, treatment and ongoing care as fully as possible.

Upon completion of the eye examination, the optometrist should provide advice on the findings of the examination to the patient, relative or carer as appropriate and with the patient's consent. This information should be given in a way that is easy to understand, and could take the form of a short written report, reassuring the patient about visual function and absence of abnormal findings (College of Optometrists 2014e). When examining a patient who is severely cognitively impaired in the absence of a relative and/or carer, the optometrist should at all times act in the best interest of the patient. It is good practice to consider writing a report of your findings to the patient's GP, leaving a copy with the patient.

Flexible and adaptable

When examining patients with dementia, it is important for optometrists to be flexible and adaptable such that their routine is influenced by the cognitive ability of the patient. For patients who have moderate to severe cognitive impairment, the optometrist may need to concentrate on objective rather than subjective tests. The College of Optometrists' guidance for professional practice stresses this need for the optometrist to be flexible during the examination, adapting techniques and using alternative appropriate methods (College of Optometrists 2014b). The PrOVIDe study research optometrists examined patients in accordance with these guidelines and were able to conduct four key tests (retinoscopy, subjective refraction, direct ophthalmoscopy and tonometry) in over 80% of participants examined in this study.

Patients with dementia may take longer to process the question they are being asked and therefore are slower in their response. It is important to bear this in mind when arranging the eye examination. A longer than normal appointment may be beneficial or it may be preferable to split the appointment over two visits rather than one for this patient group, although the current General Ophthalmic Services funding structure in England does not allow for this (Hancock et al. 2015). It may not be possible to complete all elements of the eye examination in patients with moderate or severe cognitive impairment. Any limitations to the eye examination, omission of tests and results obtained should be accurately recorded (College of Optometrists 2014b).

Consent and capacity

Capacity to consent in England is governed by the Mental Capacity Act (2005). When referring to capacity to consent in the context of the eye examination, this includes having dilating drops instilled and performing various elements of the eye examination such as tonometry. Patients' ability to make decisions may depend on the nature and severity of their cognitive impairment, or the difficulty or complexity of the decision. Healthcare professionals must assess patients' capacity to make an informed decision about the treatment and then assess if they are able to decide whether to have the treatment. In doing so, the optometrist must also be aware that a patient's capacity to consent may vary and this may require the need to reassess the patient on another occasion (College of Optometrists 2014e). Before the eye examination, the optometrist could ask the patient if there

were any tasks (vision-related) that the patient found particularly difficult. If the patient is unable to respond appropriately, the optometrist could consider speaking with the carer and/or care home staff to help establish the cognitive and other abilities of the patient.

The College of Optometrists' guidance for professional practice has an excellent section on consent and a subsection on Capacity to Consent – Adults (College of Optometrists 2014d), which states we must regard patients as lacking capacity only once it is clear that, having been given all the appropriate help and support, they cannot understand, retain, use or weigh up the information needed to make a decision or communicate their wishes (College of Optometrists 2014e).

Finally, any decisions or actions taken on behalf of the patient who lacks capacity should be in the patient's best interests. It is good practice to keep an accurate record of all discussions with the patient and carer, record the name of the carer present during the examination on the patient's record card and write a report of your findings to leave with the patient and carer.

Equipment

When examining patients with dementia, it is important to select the optimal equipment to use during the eye examination. For example, use of a computerised test chart would be advantageous because of the different chart styles available (eg Snellen, logMAR, symbols, Kay pictures) and the ease and ability to present single letters. Patients with dementia are known to have problems with mirrors, and computerised test charts are ideal when examining this patient group because they can be used without a mirror. Computerised charts are also useful in a domiciliary setting where adjustments may be required based on the viewing distance. In the PrOVIDe study it was possible to measure distance VA in 83.2% of participants when using a computerised test chart (Bowen et al. 2016).

Research optometrists who helped with the data collection in the PrOVIDe study all felt the Icare tonometer (Icare Finland Oy, Vantaa, Finland) was ideal for intraocular pressure measurements in dementia patients (Bowen et al. 2016). The Icare uses a contact technique that can be performed without the use of a topical anaesthetic. A comparison between the Icare tonometer and the Goldmann applanation tonometer (Haag Streit, Bern, Switzerland), the current reference standard method for measuring intraocular pressure, concluded that there is good agreement between the two methods of intraocular pressure measurement. In addition, the Icare tonometer is easy to use and records consistent readings rapidly, with minimal training required (Pakrou et al. 2008). Tonometry, using the Icare tonometer, was possible in almost 95% of all participants in the PrOVIDe study (Bowen et al. 2016). The importance of tonometry in older people suspected of having dementia is reinforced by the increasing prevalence of glaucoma with age; for example, rising from 0.4% in white populations aged 40–49 years to 3.3% in those aged 70–79 years (Rudnicka et al. 2006).

Whilst dilated fundus examination is optimal for detection of eye disease, it may not be possible on all patients with dementia. A total of 67% of all participants were dilated in our study, 81% of those living in their own homes and 51% of those living in care homes.

Prescribing spectacles

When prescribing spectacles generally, as optometrists, we aim to keep clinical changes in prescription to a minimum, often following the 'if it ain't broke, don't fix it' prescribing maxim (Elliott and Howell-Duffy 2015). When prescribing and dispensing new spectacles to people with dementia, it is even more important to keep unnecessary changes to a minimum because patients with dementia do not cope well with change of any sort. For example, any change in the type of lenses (eg separate pairs for distance and near vision, bifocal, progressive-power lenses) or frames (eg style and colour) used in previous spectacles may be confusing and contribute to a refusal by the patient to wear the new spectacles. If the frames look and feel the same, the patient is more likely to wear them. It is worth also bearing in mind that large changes in prescription in all older people can affect their mobility and increase the likelihood of falls (Elliott et al. 2017).

Missing and broken spectacles were another issue that was reported to be common in care homes (Bowen et al. 2016). Labelling spectacles with the wearer's name, date of supply and purpose (eg for distance or near tasks) facilitates the return of spectacles to the rightful owner (College of Optometrists 2014b). Carers can also benefit from the optometrist providing a brief report that includes the person's visual problems, the purpose of the spectacles and a recommended date for re-examination (Rashid and Sheppard 2013). Labelling current spectacles with names and functions would also assist optometrists when they carry out an eye examination. Despite these efforts, some people with dementia will refuse to wear any spectacles. These individuals may be helped by the simple measures of making things 'bigger, brighter or bolder', eg by sitting closer to the television or using improved lighting.

Advice to practitioners

Results from the PrOVIDe study show it was possible for optometrists to conduct key components of the eye examination on >80% of people with dementia. Tailoring the eye examination and spectacle dispensing is necessary to meet the needs of patients with dementia. Top tips for optometrists examining patients with dementia are:

- Make your practice dementia-friendly by becoming a Dementia Friend and having a Dementia Friends Champion in the practice.
- Improve your expertise in examining people with dementia using online videos, College of Optometrists' guidance and shadowing an optometrist with expertise in this area.
- Prepare for the appointment by asking practice staff to inform you when they have booked in a patient with dementia and speaking to a carer before the appointment.

- Involve an informed carer at every stage of the eye examination and obtain pre-appointment advice on the degree of cognitive impairment, capacity and likely level of cooperation.
- Be patient and concentrate on communication whilst allowing additional time for patient responses.
- Be flexible and adaptable in your approach by adapting your routine to the patient's cognitive ability.
- Consider capacity and consent: the patient's ability to make decisions may depend on the nature and severity of the cognitive impairment, or the difficulty or complexity of the decision.
- Choose suitable equipment, eg computerised test chart and Icare tonometer.
- When prescribing spectacles, it is important to pay additional attention to ascertaining what activities are important to the patient, allowing the optometrist, patient and/or carer to arrive at clear shared objectives for correcting vision whilst bearing in mind the maxim 'if it ain't broke, don't fix it'. This advice applies to both spectacles and lens type.
- Label spectacles with the name of the patient, date of supply and purpose of use.

Summary

Changes to UK demographics, with the most notable changes being increased life expectancy leading to an increasingly ageing population, mean increasing numbers of people will be affected by both dementia and visual impairment (VI). Various conditions cause VI in the elderly population, although cases can be prevented or treated with early detection and correct management. Optometrists frequently encounter patients with dementia during primary care eye examinations conducted in both practice and domiciliary settings, and in the hospital eye service. The PrOVIDe study, led by the College of Optometrists, used a multidisciplinary approach to investigate the prevalence of VI using eye examination data and qualitative data on the attitudes and experiences of people with dementia, carers and optometrists. Results from the PrOVIDe study show it is possible for optometrists to conduct key components of the eye examination on more than 80% of people with dementia. Tailoring the eye examination and spectacle dispensing is necessary to meet the needs of patients with dementia. This paper provides practical advice for optometrists examining patients with dementia.

Acknowledgements

We are most grateful to The Outside Clinic head office staff and their team of research optometrists for their outstanding support throughout our study.

Recruitment was made possible through the tireless efforts of the DeNDRoN (Dementia and Neurodegenerative Diseases Research Network) recruitment teams.

This project was funded by the National Institute for Health Research (Health Services and Delivery Research programme) (project number 11/2000/13). The views and opinions expressed herein are those of the authors and do not necessarily reflect those of the Health Services and Delivery Research, National Institute for Health Research, NHS or the Department of Health.

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CET multiple choice questions

This article has been approved for one non-interactive point under the GOC's Enhanced CET Scheme. The reference and relevant competencies are stated at the head of the article. To gain your point visit the College's website www.college-optometrists.org/oip and complete the multiple choice questions online. The deadline for completion is 31 January 2019. Please note that the answers that you will find online are not presented in the same order as in the questions below, to comply with GOC requirements.

1. What is the UK prevalence of dementia in people aged over 95 years?

- 1.7%
- 4%
- 20%
- 40%

2. How many people in the UK are affected by Alzheimer's disease?

- 150 000
- 520 000
- 1.64 million
- 3.5 million

3. Which one of the following approaches is most appropriate when a person with dementia refuses to wear spectacles?

- Fit contact lenses
- Make things bigger, brighter and bolder
- Use a cord to keep spectacles in place
- Use labels so it is clear which spectacles to use

4. In what proportion of people who took part in the PrOVIDe study was it possible to measure distance visual acuity successfully?

- 43.2%
- 53.2%
- 83.2%
- 93.2%

5. Capacity to consent in England is governed by which act?

- Accessible Information Standard (2016)
- Data Protection Act (1998)
- Equality Act (2010)
- Mental Capacity Act (2005)

6. What proportion of people with dementia were successfully able to undertake the key elements of an eye examination as found by the PrOVIDe study?

- 20%
- 40%
- 60%
- 80%

CPD exercise

After reading this article, can you identify areas in which your knowledge of dementia and optometry has been enhanced?

How do you feel you can use this knowledge to offer better patient advice?

Are there any areas you still feel you need to study and how might you do this?

Which areas outlined in this article would you benefit from reading in more depth, and why?