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Management of visual impairment in older people: what can the nurse do?

Susan Watkinson[†]

With the predicted rise in the number of people in the older population, the increase in the incidence of ocular conditions will present nurses with challenges for the prevalence of chronic conditions. Therefore, early referral, accurate diagnosis and prompt treatment are instrumental in improving or preserving sight in the longer term and promoting a better sight-related quality of life. Nurses play an important role as health educators, providing older people with relevant information, as well as help and support to regain sufficient control over the management of their visual problems in order to maintain self-esteem, confidence and to re-establish quality of life.

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Aim of paper

This article aims to provide an overview of some of the key issues and challenges surrounding the management of visual impairment in older people. It also aims to discuss the role of the nurse in the treatment and management of three common ocular conditions, including cataract, age-related macular degeneration (AMD) and chronic open-angle glaucoma (COAG).

Background

Visual impairment in older people presents future challenges for nurses since sight loss is largely an age-related process [1]. The incidence of the common ocular conditions cited above will inevitably increase with the predicted rise in the number of people in the older population. Early diagnosis and prompt treatment are instrumental in improving or preserving sight for as long as possible and providing the older person with a better sight-related quality of life. Therefore, nurses play an important role as health educators in providing older people with relevant information, as well as help and support to gain sufficient control over the management of their visual problems in order to maintain self-esteem and confidence, and to re-establish quality of life [1]. Knowledge and understanding of common ocular conditions and their implications, and an appreciation of the impact of sight loss on the daily living activities, are essential for the effective planning and provision of care. The role of the nurse is important in facilitating the restoration and maintenance of vision in older people in order to promote and enhance their quality of life in the longer term. This can be achieved by meeting their individual needs, and providing information about available treatments, support groups and accessing low vision services [1].

Eye care will need to be regarded as an integral component of the healthcare of older people [101]. The provision of high-quality patient-centered care is a key priority for the NHS [102]. Developing primary eye health services and building on the strengths of the NHS sight testing system forms an important part of the overall strategy to ensure safe, effective, fairer and more personalized patient care [102]. Basic projections suggest that the demand for NHS sight tests will rise by 20% over the next 20 years owing to the significant increase expected in the group of patients aged over 60 years [102]. Preventing visual impairment and blindness in older people is a key aim. 'Blindness' is defined as visual acuity of less than 3/60 or a corresponding visual field loss to less than 10° in the better eye with the best possible correction. 'Visual impairment' includes both low vision and blindness [2]. In the tenth revision of the WHO International Statistical Classification of Diseases, Injuries and Causes of Death, 'low vision' is defined as visual acuity of less than 6/18 but equal to or better than 3/60, or a corresponding visual field to less than 20° in the better eye with the best possible correction [2]. The four major causes of blindness in the UK are cataract, glaucoma, AMD and diabetic retinopathy, and 50% of all sight problems in patients aged over 65 years are due to untreated cataracts or refractive error [2]. Estimates based on official population projections and epidemiological prevalence surveys predict that the number of cases of glaucoma in England and Wales will increase by a third by 2021, and then continue to rise at a similar rate by 2031 [102].

Changing demography

The UK faces the challenges of an aging population. It is estimated that by 2031, 27.2 million people will be over the age of 50 years [103]. Over

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the next 30 years patients aged over 85 years will constitute 3.8% of the UK population [103]. Such projections will inevitably mean an increase in the incidence of visual impairment. Visual ill-health for the future will also be influenced by the association between rising obesity in older people and the development of eye disease, such as diabetic retinopathy, and the effects of smoking and AMD [102].

The demand for eye health services will therefore increase as populations grow older [3], thus impacting on the future planning of eye care services. For example, the rate of cataract surgery that a country will need to achieve in order to eliminate blindness may increase significantly if there are greater numbers of older people with cataract. Indications for surgery may change over time, as countries grow and people need to be able to read or drive a car in order to remain economically active; this will further increase the need for surgery [3].

Impact on health services

It is estimated that the NHS and local authorities spend £20 billion annually on long-term and residential care and nursing homes to support older people with visual impairment [4]. More importantly, the NHS currently spends £1.7 billion annually on treating hip fractures, mainly in older people for whom failing eyesight may have been one of the contributory factors [4]. Rehabilitation and mobility training to reduce the risk of falls could significantly reduce costs. Although vision intervention alone did not impact the fall rate, the treatment of poor vision combined with exercise and hazard management in the home produced an additional 14% reduction in the annual fall rate in the UK [5].

The UK Vision Strategy [101] aims to promote the elimination of avoidable sight loss, and improvement in the care, quality of life and opportunities for individuals and families affected by sight loss. It has identified three strategic outcomes to achieve a major transformation in UK eye health, eye care and sight loss services. These are:

- Improving the eye health of people in the UK;
- Eliminating avoidable sight loss and delivering excellent support for people with sight loss;
- Inclusion, participation and independence for people with sight loss [101].

Providing specialist care to improve eye health screening and low vision services has also remained a priority for the government.

However, the growing number of older people with dementia who may develop visual impairment is a current concern. Regrettably, no reference has been made to the need for eye care provision in the recent National Dementia Strategy [104]. The diagnosis of both dementia and sight loss is nevertheless important in maximizing the treatment and care of the individual since sensory deprivation profoundly advances the sense of disorientation [6]. Other associated problems of dementia, such as difficulty in communicating and performing daily living activities and depression [104], will undoubtedly compound failing vision [6].

Common ocular conditions

Cataract

Cataract is an abnormal progressive condition in which the lens becomes opaque (FIGURE 1). There are multiples types of cataract, but the most common type leading to surgery results in a yellowing of the crystalline lens [7]. Risk factors include diabetes mellitus, smoking, alcohol consumption and prolonged exposure to sunlight (specifically ultraviolet radiation) [8]. Most cataracts are associated with aging and usually occur bilaterally, although the rate of progression in each eye is seldom equal [9]. Signs and symptoms include painless loss of vision, the appearance of a white opacity through the pupil, gradual deterioration of sight, misty or cloudy vision, blurred images, sensitivity to light and glare, especially when driving at night, and dimming of colors [9].

Cataract visual impairment can have a major negative impact on the quality of older peoples' lives [10] and can result in difficulties with daily living activities [11]. Some commonly encountered difficulties include reading, watching television, cooking, driving and even walking. Experiencing diminished sight has been documented as deeply unsettling, stressful and anxiety-provoking, resulting in the loss of confidence, independence and freedom [12]. Raising public awareness of this condition and identifying older people in the community who could benefit from surgery is the key to restoring independence and sight-related quality of life for older people. Regrettably, there is a misconception that sight is less important in older age and that the restrictive impact of vision loss should be accepted as part of the aging process [11]. The discovery of a cataract requires referral for treatment. Both the GP and optician can refer older people directly to hospital for further assessment, diagnosis and appropriate treatment [13].

Treatment

Surgery is the only treatment of choice for a cataract and is carried out as a day-case procedure under local anaesthesia [7]. Treatment options include a technique termed phacoemulsification, or an extracapsular cataract extraction. Intraocular lens (IOL) implants are used with both procedures. Phacoemulsification is a sutureless procedure that involves ultrasonically fragmenting the lens and removing it through a suction device, leaving behind the posterior capsule for insertion of the IOL [105]. An extracapsular extraction is an older but effective technique. It involves the removal of the whole nucleus, cortex and anterior capsule, again leaving the posterior capsule intact for insertion of the IOL. The opening into the eye is much larger, resulting in the use of sutures and larger refractive errors after surgery. Good unaided distance visual acuity is currently a realistic expectation following IOL implantation [105]. Another option available is the use of implant lenses, which restore some of the near focusing ability of the eye. Where this option is not possible, near vision will require the additional refractive power provided by reading glasses [14].

Role of the nurse

Effective communication and provision of information are essential in alleviating the anxiety associated with day-case surgery [15]. The provision of both verbal and written information to patients and their families in order to enhance knowledge and understanding of the condition, the proposed surgical procedure and the importance of compliance with prescribed postoperative eye medications to restore ocular health is essential. Health education and health promotion for patients and family members is important. Demonstrating the safe instillation of eye drops and stressing the importance of hand washing before and after the procedure to prevent ocular infection is crucial [16]. Since the use of multiple drops are required postoperatively with schedules that taper, the nurse also plays an important role in counseling the patient on drop usage. Postoperative advice focuses on the need for daily observation of the eyes for signs of excessive redness, swelling or stickiness indicating the presence of infection. In the early postoperative period, the need to monitor for symptoms of pain, loss of vision and redness indicating endophthalmitis (internal eye infection) is important and requires immediate contact with the eye unit for advice and prompt treatment to avert further complications. Similarly, pain felt around the eye or sudden

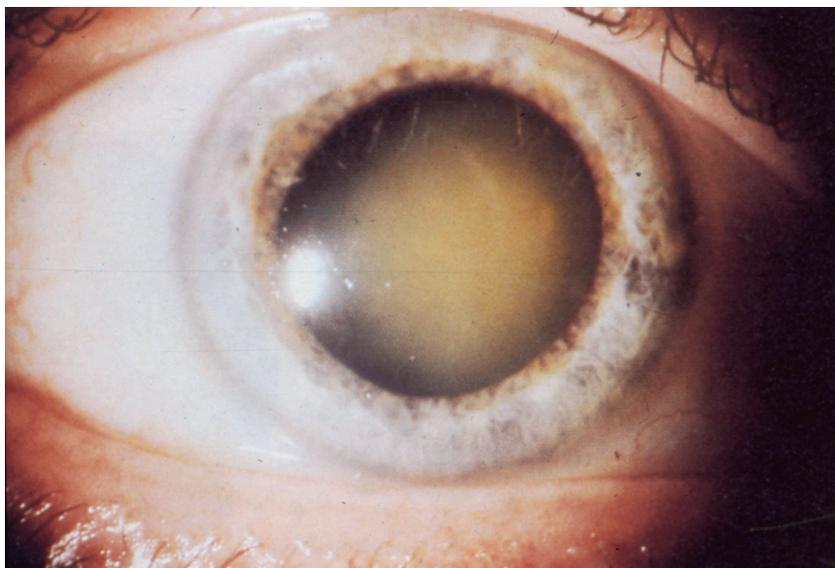


Figure 1. Mature cataract.

Reproduced with permission from Moorfields Eye Hospital, NHS Foundation Trust, UK.

reduced vision may signal the onset of ocular complications, such as secondary glaucoma or retinal detachment, which, although extremely rare in the early postoperative period, would necessitate the same course of action. The provision of a cartella shield for wearing at night time, for at least 2–4 weeks, affords protection from any ocular trauma during sleep [16]. Health promotion advice includes the need for an annual visit to the optician, and, if driving is essential, verification of safety to drive by an ophthalmologist is required under the Driver and Vehicle Licensing Agency (DVLA) guidelines [106]. Where there are no complications, a follow-up telephone call is made on the first or second postoperative day, and attendance at a hospital clinic appointment 2 weeks later is required to monitor visual progress [1].

Age-related macular degeneration

Age-related macular degeneration is the term applied to changes that occur with age without any obvious cause that occur in the macula, the central area of the retina, in people aged 50 years and over (FIGURE 2). Its prevalence increases dramatically after the age of 75 years [107]. It is the leading cause of irreversible blindness in the group of patients aged over 50 years in the western world [17]. In the UK, AMD accounts for more than half of all registered blindness [18].

The pathogenesis is still poorly understood; however, degeneration of the retinal pigment epithelium, changes in Bruch's membrane and the formation of subretinal deposits (drusen) are central to disease progression [19]. Progressive diffuse thickening of Bruch's membrane reduces

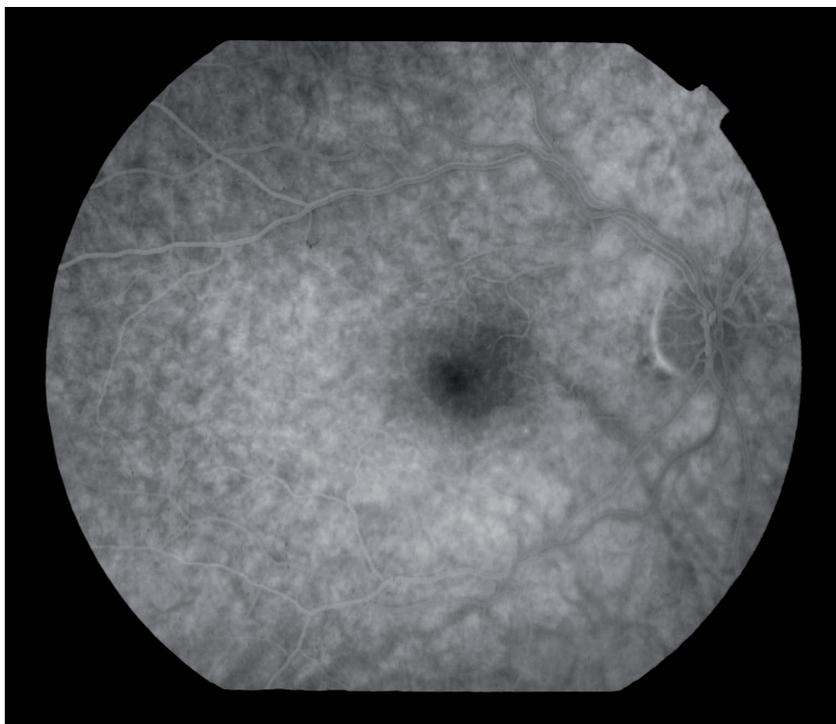


Figure 2. Normal retina and macula.

Reproduced with permission from [28].

the ability of oxygen to diffuse through to the retinal pigment epithelium and photoreceptors, leading to hypoxia. The latter gives rise to the release of growth factors and cytokines, which stimulate the growth of new choroidal blood vessels. These vessels leak serous fluid or blood, resulting in distortion and reduced clarity of central vision (FIGURE 3) [19]. However, peripheral vision remains unaffected. Alternatively, visual loss results from a progressive degenerative process to cell death and atrophy of the retinal pigment epithelium [19]. Whilst hypoxia may play a role, current understanding now suggests that photo-oxidative stress and lysosomal lipid abnormalities are far more important [19]. The signs and symptoms of AMD are shown in Box 1.

Classification

Age-related macular degeneration is classified as either 'dry' or 'wet' [19]. Dry AMD is the most common form, usually associated with an insidious onset and rate of progression [7]. It accounts for approximately 85% of AMD cases and leads to a mild-to-moderate loss of sight, although peripheral vision is retained. Severe cases generally lead to legal blindness. At present, there is no treatment for dry AMD [7]. Wet AMD is less common, but is increasing with the aging population, and because it can lead to severe sight loss within days [7], it accounts for 80–90%

of all registered blind AMD patients [17]. It is characterized by the growth of new blood vessels beneath the retina, known as choroidal neovascularization (CNV). CNV can be divided into classic and occult forms according to its appearance on investigation by fluorescein angiography. The classic form is associated with a more abrupt and rapid progression of visual loss than the occult form [108]. In the UK, 243,000 people have wet AMD and 26,000 new cases are predicted each year [107].

Etiology

The exact etiology of AMD is unknown, but there are several risk factors of which age is the strongest [20]. General risk factors include smoking, elevated cholesterol, hypertension, cardiovascular disease, race (Caucasians are more likely to have CNV) and a family history [21]. Ocular factors include presence of soft drusen, macular pigmentary change and CNV in the other eye [20].

The risk of developing AMD is 3.6-times greater for current and former smokers than for those who have never smoked [19]. Diet and nutrition may play an important part in AMD and in maintaining eye health. Treatment with oral vitamins and antioxidants, comprising vitamin C, vitamin E, β -carotene, zinc and copper, has been found to reduce the 5-year risk of progression to late AMD [19]. However, smokers taking β -carotene have been demonstrated to have an increased risk of developing lung cancer [19]. Virtually all studies to date have been designed to look at supplement impact on end-stage AMD. However, recent evidence has emerged from a systematic review and meta-analysis indicating that vitamins A, C and E, zinc, lutein, zeaxanthin, α - and β -carotene, cryptoxanthin and lycopene have little or no effect in the primary prevention of early AMD [22]. A systematic review of three randomized, controlled trials has also demonstrated that antioxidant supplements do not prevent early AMD [22]. Excessive sun exposure has been highlighted as a possible risk factor, but is not yet supported by published studies [23].

Diagnosis

An Amsler grid is an essential tool for diagnosing AMD and enabling the self-assessment of visual loss at home on a weekly basis. However, diagnosis is based mainly on an ophthalmoscopic examination using slit-lamp biomicroscopy with fundus examination, optical coherence tomography and fluorescein angiography. Optical coherence tomography is an advanced, noninvasive procedure that produces high

resolution, cross-sectional imaging of the retinal layers [19]. Posterior segment optical coherence tomography enables a detailed analysis of the optic disc, retinal nerve fiber layer and macula. Microscopic changes in the macula can be imaged and measured [19].

Treatment

There is no cure for AMD. However, there are two main approaches to managing wet AMD, which include photodynamic therapy (PDT) and intravitreal drug therapy [107]. PDT involves administering an intravenous infusion of verteporfin over 10 min, followed by the application of a nonthermal laser (diode) for 83 s [107]. The main aim of PDT is to preserve retinal function, visual acuity, contrast sensitivity and central visual field for as long as possible [107]. Treatment will not restore lost vision, but it can help to reduce further vision loss over 2 years. PDT is only indicated in patients with predominantly classic subfoveal CNV. Whilst it is an invaluable therapy, it is not available for all types of lesion. The advent of anti-VEGF therapy has begun to revolutionize the treatment of wet AMD [107]. The current drugs of choice are ranibizumab and bevacizumab. A key counseling point is the major difference in cost of the two treatments. Ranibizumab was specifically engineered for ophthalmic use, while bevacizumab was designed for gastrointestinal cancer, but appears to work equally well in the eye. The cost difference is approximately £1000 versus £50 per injection, respectively. These drugs are injected into the vitreous and specifically bind to and inhibit the VEGF. The latter is a potent inducer of vascular permeability, stimulates angiogenesis and may have proinflammatory effects, all of which are thought to contribute to the progression of wet AMD [107]. The procedure involves inserting the needle of the syringe containing the intravitreal drug perpendicular through the sclera with the tip aimed towards the center of the globe to avoid any contact with the posterior lens. An appropriate volume (0.05–0.1 ml) of the therapeutic agent is injected slowly and carefully, and the needle removed slowly [107]. After the injection it is important to check that the patient can count fingers or can see hand movements to ensure the central retinal artery is perfused [107].

A major limitation of VEGF inhibition therapy is the need for repeated intravitreal injections with its attendant risks of endophthalmitis, retinal detachment and traumatic cataract [107]. To overcome this, combination treatments of ranibizumab and PDT have been tried and appear



Figure 3. Abnormal retina (classic neovascularization).

Reproduced with permission from [28].

to reduce the need for retreatment, but visual results have not been as good as those recorded with ranibizumab alone. The FOCUS trial of 164 patients with predominantly classic CNV met its primary efficacy end point of maintaining or improving vision (defined as a loss of less than 15 letters in visual acuity on the Early Treatment Diabetic Retinopathy Study [ETDRS] chart). Results at 12 months demonstrated that over 90% of patients treated with the combination of PDT and ranibizumab maintained or improved vision compared with approximately 68% treated with PDT alone ($p < 0.0003$). However, this study raised safety concerns over the combination of PDT and ranibizumab as a higher proportion of uveitis was reported in this group [107]. However, other studies have not raised the same

Box 1. Signs and symptoms of age-related macular degeneration.

- Objects appear to change shape, size or color
- Objects may appear to move or disappear
- Vision becomes blurred
- Lines may become distorted
- Dark spots may appear in central vision
- Area of blindness may block out several words at normal reading distance
- Difficulty is experienced seeing in bright light
- Glare is experienced
- Difficulty in adapting from light to dark conditions

Adapted from [7].

Box 2. Features of Charles Bonnet syndrome.

- Patients experience complex visual hallucinations (i.e., fully formed images).
- Hallucinations include: patterns (e.g., brickwork and grids), letters, people (sometimes distorted or incomplete), animals, objects and landscapes.
- There is no sound associated with these hallucinations.
- The hallucinations are caused by impulses from the visual cortex in the absence of visual stimulation.
- Hallucinations may start occurring soon after the onset of visual loss, but they can sometimes appear up to 10 years later.

Adapted from [29].

safety concerns (e.g., PROTECT, MARINA and ANCHOR). Larger trials (e.g., the SUMMIT studies) are now underway to assess the safety and efficacy of PDT and ranibizumab compared with ranibizumab monotherapy.

Triple therapy

Trials are underway to investigate triple therapy to treat macular degeneration. The rationale is that PDT will eradicate the existing CNV, the steroid will limit the inflammatory response and further reduce upregulation of VEGF and the anti-VEGF will prevent any further angiogenesis. The RADICAL study looking at the combination of PDT, ranibizumab and dexamethasone is underway, but other larger randomized, controlled trials of therapies are justified [107].

Emerging therapies

Treatments for exudative AMD continue to develop. Other methods of VEGF inhibition are being investigated, such as a recombinant VEGF-binding protein termed VEGF-Trap, receptor tyrosine kinase inhibitors, or post-transcriptional silencing of gene expression. Combination therapies and revisiting radiotherapy using a targeted focal delivery system are also currently under evaluation. Different modes of drug delivery are also being developed. Therapies that are undergoing investigation for genetically determined retinal disorders may also be applicable for treatment of late AMD [107].

Role of the nurse

Decreased visual function is associated with diminished quality of life and functional activities of living [24]. Recent systematic reviews provide evidence for the impact of AMD on quality of life, which includes functional impairment, depression, anxiety and emotional distress [25,26]. Dry AMD is slowly progressive and can lead to vision loss; wet AMD can progress rapidly to vision loss and patients are very likely to be anxious and apprehensive [1]. On average,

patients with wet AMD are almost twice as depressed as people with normal vision and as the severity of AMD increases the patient's feelings of depression also increase [27]. Quality time spent with the patient is crucial in order to explain the treatment and allay associated fears and anxieties [28]. Counseling skills are essential to help patients deal with the shock of visual loss and provide the basis for subsequent empowerment [28].

In patients with moderate visual loss, approximately 10% will, at some point, experience visual hallucinations, a condition known as Charles Bonnet Syndrome (CBS) [29]. Among those with more severe visual loss, this increases to approximately 50–60% of patients [29]. CBS occurs mostly in people who have developed severe visual loss involving central vision in both eyes of which AMD is a cause [29]. Box 2 lists some of the features of CBS. Visual hallucinations can provoke anxiety and be unsettling, and lack of information about the condition can lead to even greater distress in patients. Patients may believe they are suffering from a mental condition, such as dementia, and that they are not only losing their sight, but also their mind [29]. Recent research evidence suggests that among those suffering from CBS, 60% feared being labeled as insane if they admitted to hallucinations, only 30% had ever revealed their condition to anyone else, and 30% lived in fear of impending insanity [30].

There is currently no treatment for CBS. However, the nurse can still play a crucial role in alleviating the anxiety experienced by patients by informing them about the condition and reassuring them about their mental state. The following reassuring statements may be offered:

- It is estimated that 50–60% of people suffering from severe visual loss will experience visual hallucinations;
- These visual hallucinations appear to abate after a while – for 60% of people they have gone by 18 months;
- The visual hallucinations are purely a visual symptom and not due to any mental health problem;
- Some patients are able to find ways of controlling their hallucinations or of distinguishing between a real sight and a hallucination. 'Tricks' reported by sufferers include going into a brighter environment creating a distraction, looking directly at the images and some form of eye movement. These suggestions may not work for all patients [30,31].

Hopefully, such information will help to reduce the patient's anxiety about their mental state. They will also feel more equipped to develop ways of managing their hallucinations and may become more confident in using their residual vision [29]. This condition remains largely unrecognized, and further awareness of it should encourage patients to report their fears. The Royal College of Ophthalmologists (RCO) and Macular Disease Society (MDS) have now initiated a campaign to increase awareness of CBS amongst eye care staff.

The nurse's role in providing health education is also significant since the aim is to restore sufficient independence to re-establish a quality of lifestyle [1]. Health education must also embrace family members since the burden of care falls heavily on the family who are often the primary caregivers [27]. Wet AMD has a major impact on the daily lives of those who have this disease, although this is largely underestimated by both the public and clinicians [27]. Wet AMD patients have approximately a third of the ability of people with normal vision to perform everyday activities, such as reading a newspaper, cooking, reading street signs and walking down steps and curbs in low light [27]. They have under half the ability of people with normal vision to perform everyday 'distance' activities, such as recognizing faces, watching television and taking part in outdoor activities [27]. Patients thus need significantly more practical support and assistance in performing daily activities than those with normal vision. Advice about overcoming the practical problems of daily living, especially reading and writing, and enhancing visual rehabilitation is paramount. Patients should be referred to the low-vision hospital clinic, the visually impaired team, social services and the rehabilitation team [1]. Advice can be provided on magnifying devices and large-print materials to assist with reading. Audio-taped books, newspapers and magazines are also available. Other appliances, such as liquid level indicators, talking watches, clocks, kitchen scales and microwave ovens, may help to compensate for the loss of detailed vision [1].

It is advantageous to put patients in touch with patient support groups such as the AMD Alliance and the Royal National Institute of Blind People (RNIB). The MDS also offers essential help and support in meeting a wide range of needs, and setting up patient support groups in hospital eye units. Advice on the need to visit the optician once every 2 years for an eye test is important, particularly as eye tests are free for people over the age of 60 years in the UK [109].

The public education role of the nurse is paramount in promoting the importance of early detection and early treatment of this condition to avert the risk of irreversible vision loss. The chance to disseminate information at public healthcare seminars would be advantageous. It takes on average 14–15 months for those with untreated wet AMD to progress to legal blindness or worsened vision. Early detection through periodic eye examinations is vital as the patient can begin to lose vision in as little as 3 months after detection. Early intervention is the key to preserving vision [27].

Chronic open-angle glaucoma

Chronic open-angle glaucoma (COAG) is a degenerative process in the trabecular meshwork, with deposition of extracellular material within the meshwork and beneath the endothelial lining of Schlemm's canal (FIGURE 4). This leads to reduced aqueous drainage and a rise in intraocular pressure (IOP) [19]. The increased IOP is thought to compress the optic nerve, causing cell death and a progressive, gradual reduction in the visual field [32]. The clinical features include slight-to-moderate increase in IOP (24–32 mmHg), open drainage angle, visual field loss, cupping of the optic disc and loss of peripheral vision [7]. However, a third to a half of patients with glaucoma have pressure under 21 mmHg.

Chronic open-angle glaucoma has a non-dramatic onset and generally occurs after the age of 40 years. Importantly, it affects older people as it is a chronic condition that requires lifetime monitoring and management once detected. At present, there are 480,000 people affected by COAG in the UK, and over a million glaucoma-related hospital outpatient visits annually [110]. After AMD, glaucoma is one of the principal reasons for people having to register as blind. Ocular hypertension (OHT) is a major risk factor for developing COAG, although COAG can occur with or without raised IOP [110]. OHT is where there is a consistently or recurrently elevated IOP (greater than 21 mmHg) in the absence of clinical evidence of optic nerve damage or visual field defect [110]. Other risk factors include advancing age, Black race (African or African–Caribbean), Hispanic ethnicity, family history, increased cup:disc ratio (this compares the diameter of the cupped portion of the disc to its overall diameter), systemic hypertension, cardiovascular disease, diabetes, myopia, smoking and long-term steroid use [32].

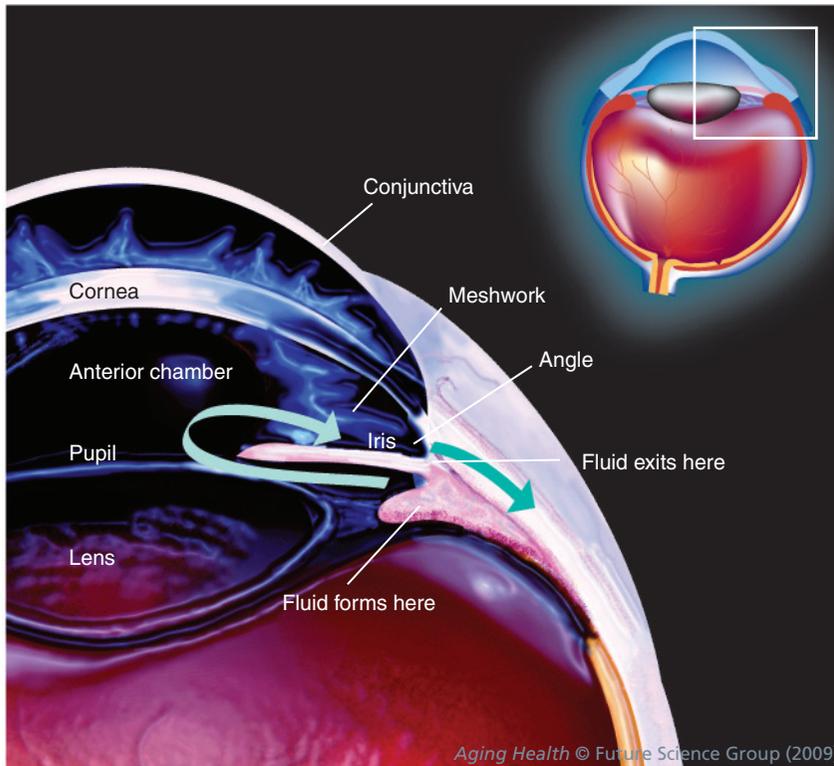


Figure 4. Drainage angle of the eye.

Clinical diagnosis

At diagnosis, the following should be offered [110]:

- IOP measurement using Goldmann applanation tonometry;
- CCT measurement;
- Peripheral anterior chamber configuration and depth assessments using gonioscopy;
- Visual field measurement using standard automated perimetry;
- Optic nerve assessment, with dilatation, using stereoscopic slit-lamp biomicroscopy with fundus examination;
- Obtain an optic nerve head image.

When abnormal features are identified at the optic disc, a judgment has to be made as to whether the abnormalities are likely to represent progression of the condition [19].

Treatment

Treatment consists of pharmacological agents for topical use as eye drops, laser procedures and drainage surgery with or without pharmacological augmentation. Overall, treatment is aimed at slowing progression and reducing IOP to prevent major sight loss [32]. Pharmacological treatment includes the use of a prostaglandin analog, β -blocker, carbonic anhydrase inhibitor

or sympathomimetic, or a preservative-free preparation if the person is allergic to preservatives. More than one agent may be needed concurrently [110]. It is important to check that there are no relevant comorbidities or potential drug interactions before offering medication. Whilst ocular hypotensive treatment is vital, compliance is typically low, so counseling on compliance is a key nursing function. A typical drug regime consisting of Latanoprost 0.005% eye drops, a topical prostaglandin, to increase the uveoscleral outflow of aqueous humor from the eye, and dorzolamide 2% eye drops, a topical carbonic anhydrase inhibitor, to reduce the production of aqueous, may be prescribed to effectively lower the IOP [32].

Surgery or laser treatment is necessary when the IOP remains uncontrolled resulting in further deterioration of sight and visual field loss. Laser treatment is often a first choice in Europe over the instillation of eye drops. Laser trabeculoplasty is performed using argon laser to create several tiny holes in the trabecular meshwork. This causes scars, which, on contraction, will widen the channels of the meshwork and make it easier for the aqueous humor to flow out and reduce the IOP [7]. More advanced cases usually necessitate a trabeculectomy (creation of a fistula), which provides an alternative route for the drainage of aqueous humor out of the eye to reduce the pressure and prevent further damage.

Monitoring

Although not all people with OHT or suspected COAG are recommended to receive medication [110], assessing the IOP, optic nerve head and visual field assessment are deemed necessary at the following intervals:

- Between 12 and 24 months if there is a low risk of conversion to COAG
- Between 6 and 12 months if there is a high risk of conversion to COAG

If no change in the parameters has been detected after 3–5 years (depending on perceived risk of conversion), or before if confirmed normal, the person should be discharged from active glaucoma care to community optometric care [110]. At discharge, people not recommended for treatment and whose condition is considered stable are advised to visit their primary-care optometrist annually for detection of any future changes in their condition [110]. Otherwise, people with COAG require monitoring at regular intervals according to their risk of progression to sight loss (see [110]).

Following full recovery from surgery or laser trabeculoplasty, monitoring should be restarted according to IOP, optic nerve head appearance and visual field.

Role of the nurse

Focusing on patient education for empowerment and long-term self-management of the condition is paramount since the majority of older people with COAG are based in the community [33]. Offering older people and their relatives the opportunity to discuss the diagnosis, prognosis and treatment, and provide them with relevant information in an accessible format at initial and subsequent visits is the basis for concordance with prescribed treatment. Glaucoma can run in families, and family members may wish to be tested for the disease. Providing information about the nature of the condition, its life-long implications, the different types of treatment options and their associated side effects, and the need for regular monitoring are all important. For example, the prostaglandin drugs, such as latanoprost (Xalatan[®]), give rise to irreversible, but benign darkening of the iris and increased growth and thickening of the eyelashes [32]. The use of carbonic anhydrase inhibitor drugs, such as dorzolamide (Trusopt[®]), often cause discomfort and altered taste [32]. Following laser trabeculoplasty, some inflammation and soreness might be experienced [32], but this can be managed by the use of nonsteroidal inflammatory drugs [32]. Possible complications of a trabeculectomy include corneal damage, delayed healing, scarring and excess fluid loss from the eye [32].

Exploring older peoples' expectations of better vision associated with treatment is crucial since clarification is required to dispel false hopes that either medical or surgical intervention will improve existing vision. Once sight has been lost, it cannot be recovered, although most people treated for COAG will not go blind [110]. Nevertheless, compliance with treatment is vital in seeking to maintain the IOP within normal limits in order to preserve existing vision, and prevent any further visual field loss. Asking questions about the older person's vision and visual problems, especially at night and when walking down steps and curbs, is essential as part of the ongoing assessment and evaluation of this condition [33].

Promoting self-care is achieved by teaching older people and relatives how to instill eye drops safely and at the appropriate time, and the importance of hand washing both before

and after instillation are essential in the prevention of infection, particularly after surgery [33]. Liaising with relatives regarding the continuity of care after surgery is especially important since they can make a valuable contribution to optimizing the older person's adherence to prescribed ocular treatment. Observing the eyes daily for any signs of excessive swelling or stickiness, indicating the presence of infection, is important and necessitates appropriate referral to the GP [33].

Explaining the need to attend regular clinic appointments for assessment and further monitoring of the condition is paramount in identifying any deterioration and potential threats to future sight-related quality of life. Liaising with agencies, such as the RNIB, International Glaucoma Association (IGA) and local patient support groups, can provide a means of additional help and support to improve the older person's quality of life. Since there is an increased familial risk of developing COAG, relatives are advised to undergo regular sight tests every 2–3 years. Eye tests are free for relatives of people with glaucoma (age 40 years and over) [34]. If driving is essential for the older person, safety to drive should be verified by an ophthalmologist and the DVLA guidelines should be followed [106].

Conclusion

This review concludes that the UK faces current and future challenges of an aging population owing to a changing demographic structure. Sight loss is largely an age-related process, and ocular diseases particular to older people, such as cataract, AMD and COAG, have become increasingly important. Their undoubted increased incidence will necessitate serious consideration for the future financial burden of visual impairment for the UK. For example, AMD has significant direct and indirect costs to society. Direct costs include inpatient and outpatient expenses, home health visits, nursing care and social services. Indirect costs include work absence and lost productivity. On average, the annual cost exceeds £1.5 billion, not including additional home costs. AMD poses an economic burden with an annual average cost per patient across Europe; significantly more than for those patients in general medical care [27].

The UK Vision Strategy highlights the importance of improving the ocular health of people in the UK [101]. It also aims to promote the elimination of avoidable sight loss, and promote improvement in the care, quality of life

and opportunities for individuals and families affected by sight loss by the year 2020 [101]. Commissioners of community-based eye care services will need to develop services, which prevent the development of eye disease once it has been diagnosed as well as provide treatment or provide support for sight loss when treatment is no longer an option [102]. Investment in identifying sight problems at early stages and treating where possible provides a means to reduce future demands for more complex and costly support from the health and social care system and improve quality of life for older people with visual problems [102]. Early initiated treatment results in the preservation of more vision [27]. Nurses are more likely to encounter older people more frequently than any other age group in the future, and this means that visual impairment in this age group will present many challenges for developing the nurse's role in practice in order to meet with the growing demands of the delivery of both primary and community-based eye health services. Important factors will therefore need to be considered, such as advancing their professional knowledge base related to practice, developing effective communication and counseling skills, and demonstrating their knowledge of the ethical and legal rights of patients and applying it in their role as the patient's advocate in the decision-making process. Above all, there is the need to continue to advance practice and demonstrate the delivery of a high quality of evidence-based care for older people with ocular conditions. Such factors embody the major challenges for the future role of the nurse and translate into some key strategies. The latter include professionalism and competence, evidence-based

ophthalmic practice, legal and ethical issues, reflection and critical thinking, and advancing practice. Overall, nurses need to demonstrate professional behavior, intrinsic motivation and commitment to ongoing participation in professional education. Such attributes provide a platform for developing political awareness and strong leadership skills. Without the essential assertiveness and political skills, the nurse of the future will be unable to engage in argument for more resources for the care and management of older people with visual impairment [34]. The political clout to be gained through articulating an increasing knowledge of public health issues, government healthcare policies, legal and ethical issues, professional developments, evidence-based practice, critical appraisal skills, and the ability to critique and implement research evidence cannot be underestimated [34].

Future perspective

With the predicted increase in the number of older people over the next three decades, the continued funding of the cost of treating major ocular disease is speculative for the future. The implication of continued financial constraint over the next decade may result in the UK government's inability to meet the key NHS priority for the healthcare of older people with sight impairment. Such constraint may also result in a decline in the numbers of qualified practitioners and the delivery of high standards of care. The cheaper option for the future may be the employment of assistant healthcare workers to continue to provide basic care and services to this vulnerable group of older people within society.

Executive summary

Background

- Visual impairment in older people presents many future challenges for nurses since sight loss is largely an age-related process.
- Nurses play an important role as health educators in facilitating the restoration and maintenance of vision to enhance sight-related quality of life in older people.

Demographic change & impact on health services

- By 2031, 27.2 million people will be over the age of 50 years. In the next 30 years, people aged over 85 years will constitute 3.8% of the UK population.
- The demand for eye services will increase and eye care will need to be regarded as an integral component of the healthcare of older people.

Common ocular conditions

- Cataract visual impairment can have a major negative impact on the quality of older peoples' lives.
- Age-related macular degeneration (AMD) is the leading cause of irreversible blindness in people aged over 50 years in the Western world. In the UK, it accounts for more than half of all registered blindness. There is no cure for AMD.
- Chronic open-angle glaucoma affects older people as a chronic condition requiring lifetime monitoring and management.
- Chronic open-angle glaucoma affects approximately 480,000 people in the UK and after AMD is one of the principal reasons for having to register as blind.

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