Vision Care for Seniors
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As we age, the eyes undergo natural structural changes that can affect vision quality. Understanding these changes helps distinguish normal aging from conditions requiring medical attention.

Age-Related Changes

- Presbyopia — The eye's lens stiffens, making it harder to focus on close objects. Most noticeable after age 40. Reading glasses or bifocals are the typical solution.
- Reduced pupil size — Pupils become smaller and respond more slowly to light changes, making adaptation to darkness and glare more difficult.
- Decreased contrast sensitivity — Distinguishing between shades and subtle differences in color or contrast becomes harder.
- Vitreous floaters — The gel-like vitreous inside the eye shrinks and becomes more liquid, causing "floaters" (specks or strands in vision). Usually harmless but should be evaluated if sudden or numerous.
- Dry eyes — Tear production decreases with age, leading to dryness, burning, or a gritty sensation.
- Reduced color perception — The lens yellows over time, slightly altering how colors appear, especially blues.

Warning Signs
Consult an eye doctor promptly if you experience:
- Sudden vision loss or blurring
- Flashes of light or a sudden increase in floaters
- A "curtain" or shadow across part of your vision
- Double vision
- Persistent eye pain or redness
- Halos around lights

Eye Conditions in Older Adults

Age-Related Macular Degeneration (AMD)
AMD affects the macula (the central part of the retina) and is the leading cause of vision loss in people over 60. Types:
- Dry AMD — Gradual breakdown of light-sensitive cells in the macula. Accounts for ~85–90% of cases.
- Wet AMD — Abnormal blood vessels grow under the retina and leak fluid, causing rapid and severe vision loss. Less common but more serious.

Symptoms: Blurry or distorted central vision, straight lines appearing wavy (use an Amsler grid for self-monitoring), difficulty recognizing faces, dark or blurry areas in the center of vision.

Cataracts
A cataract is a clouding of the eye's natural lens, located behind the iris and pupil.
Symptoms: Blurry, hazy, or dim vision; increased glare and halos around lights; faded colors; frequent prescription changes; poor night vision.

Risk increases with: Age, UV exposure, smoking, diabetes, prolonged steroid use, and eye injury.

Glaucoma
A group of eye diseases that damage the optic nerve, often associated with elevated intraocular pressure (IOP). Frequently called the "silent thief of sight" because vision loss is gradual and often painless until advanced. Types:

- Open-angle glaucoma — The most common form; peripheral vision is lost slowly over years.
- Angle-closure glaucoma — Less common but can be acute and is a medical emergency (sudden pain, nausea, blurred vision, halos).
- Normal-tension glaucoma — Optic nerve damage occurs even with normal eye pressure.

Diabetic Retinopathy
Damage to the blood vessels of the retina caused by long-term diabetes. A leading cause of blindness in working-age and older adults.
Stages:

- Non-proliferative (early): Blood vessels leak or swell; usually no symptoms initially.
- Proliferative (advanced): Abnormal new blood vessels grow on the retina and can bleed into the vitreous.

Dry Eye Syndrome
Chronic insufficient or poor-quality tear production. Very common in elderly adults, particularly postmenopausal women.

Symptoms: Burning, stinging, or gritty feeling; redness; watery eyes (a reflex response to dryness); sensitivity to light; blurred vision.

Retinal Detachment
The retina separates from the back wall of the eye. More common after age 50, especially in people who are very nearsighted or have had eye surgery.

Emergency warning signs: Sudden increase in floaters, flashing lights, or a shadow/curtain over part of vision. Requires immediate medical attention.

Epiretinal Membrane and Macular Hole
Scar tissue or a break forms on or near the macula, causing central vision distortion. More common with advancing age.

<u>Medical Treatments</u>

Treatment	Type of AMD	Description
Anti-VEGF injections (Ranibizumab, Bevacizumab, Aflibercept, Faricimab)	Wet AMD	Injections into the eye to block abnormal blood vessel growth; typically monthly or every 2–3 months
Photodynamic therapy (PDT)	Wet AMD	Light-activated drug destroys abnormal vessels
Low-vision rehabilitation	Both	Magnifiers, adaptive technology, occupational therapy
AREDS2 supplements	Dry AMD (intermediate to advanced)	Slows progression in certain patients

Note: There is currently no FDA-approved treatment to reverse dry AMD, but ongoing research (including gene therapy and complement inhibitors such as Pegcetacoplan/Syfovre and Avacincaptad pegol/Izervay) shows promise.

Cataract Surgery
Cataract removal is one of the safest and most common surgeries worldwide.

- Phacoemulsification: Ultrasound probe breaks up the cloudy lens, which is then removed via suction. An artificial intraocular lens (IOL) is implanted.
- Laser-assisted cataract surgery (FLACS): A femtosecond laser makes incisions and softens the lens before removal. May offer precision advantages in some cases.
- IOL options: Monofocal (distance or near), multifocal (distance and near), extended depth of focus (EDOF), and toric (astigmatism correction) lenses.
- Recovery: Usually rapid — improved vision within days. Full healing takes 4–6 weeks.

Glaucoma Treatments
Medications (first-line): Eye drops to lower intraocular pressure (see Section 4).

Laser procedures:

- Selective Laser Trabeculoplasty (SLT): Improves drainage of fluid from the eye; often used for open-angle glaucoma.
- Laser peripheral iridotomy (LPI): Creates a small hole in the iris to improve fluid drainage; used for angle-closure glaucoma.

Surgical procedures:

- Trabeculectomy: Creates a new drainage channel to lower IOP.
- Minimally invasive glaucoma surgery (MIGS): Smaller procedures with fewer risks (e.g., iStent, Hydrus Microstent, Kahook Dual Blade).
- Tube shunt surgery: A small tube is implanted to drain fluid when other treatments fail.

Diabetic Retinopathy Treatments

- Laser photocoagulation: Seals or destroys leaking blood vessels. For proliferative retinopathy, panretinal photocoagulation (PRP) is used.
- Anti-VEGF injections: Reduce abnormal blood vessel growth and fluid leakage (same drugs used in wet AMD).
- Vitrectomy: Surgical removal of the vitreous gel and scar tissue; for severe bleeding or tractional retinal detachment.
- Steroid implants (Ozurdex, Iluvien): Slow-release corticosteroid implants for diabetic macular edema.

Retinal Detachment Repair

- Pneumatic retinopexy: A gas bubble is injected into the eye to push the retina back into place, followed by laser or freezing treatment.
- Scleral buckle: A silicone band is placed around the eye to indent the wall and relieve traction.
- Vitrectomy: Removes the vitreous and allows the surgeon to directly reattach the retina.

Dry Eye Treatments

- Punctal plugs: Tiny plugs inserted into tear ducts to reduce tear drainage.

- Intense Pulsed Light (IPL) therapy: Reduces inflammation of the eyelid glands (meibomian gland dysfunction).
- LipiFlow: Thermal pulsation device to clear blocked meibomian glands.
- Autologous serum eye drops: Drops made from the patient's own blood serum; for severe dry eye.

Medications for Eye Conditions

Important: All medications should be prescribed and monitored by a licensed eye care provider. Never discontinue or alter dosages without medical guidance.

Glaucoma Medications (Eye Drops)

Drug Class	Examples	Mechanism
Prostaglandin analogues	Latanoprost (Xalatan), Bimatoprost (Lumigan), Travoprost (Travatan Z)	Increase fluid outflow; most commonly prescribed first-line
Beta-blockers	Timolol (Timoptic), Betaxolol (Betoptic)	Reduce fluid production
Alpha-2 agonists	Brimonidine (Alphagan P)	Reduce fluid production and increase outflow
Carbonic anhydrase inhibitors	Dorzolamide (Trusopt), Brinzolamide (Azopt)	Reduce fluid production
Rho kinase inhibitors	Netarsudil (Rhopressa)	Increase fluid outflow via trabecular meshwork
Combination drops	Cosopt (timolol + dorzolamide), Simbrinza	Convenience; fewer daily drops

Oral options (for refractory glaucoma): Acetazolamide (Diamox) — a carbonic anhydrase inhibitor taken by mouth; often used short-term due to side effects.

Anti-VEGF Injections (AMD and Diabetic Retinopathy)

Drug	Brand	Notes
Ranibizumab	Lucentis	FDA-approved for both AMD and diabetic retinopathy
Bevacizumab	Avastin	Used off-label; significantly lower cost
Aflibercept	Eylea	Longer interval between injections in many patients
Faricimab	Vabysmo	Newest; dual-pathway inhibitor; up to 4-month dosing intervals
Brolucizumab	Beovu	Longer dosing intervals; risk of intraocular inflammation

Dry Eye Medications

Drug	Type	Use
Cyclosporine A 0.05% (Restasis)	Prescription eye drop	Reduces inflammation; increases tear production
Lifitegrast 5% (Xiidra)	Prescription eye drop	Reduces inflammation; rapid symptom relief
Varenicline (Tyrvaya)	Nasal spray	Stimulates tear production via trigeminal nerve
Over-the-counter artificial tears	Drops/gel/ointment	Lubricates; preservative-free preferred for frequent use

Corticosteroid Eye Drops
Used short-term for inflammation following surgery, injury, or inflammatory eye disease. Examples: Prednisolone acetate (Pred Forte), Loteprednol (Lotemax), Difluprednate (Durezol).

Caution: Long-term steroid eye drop use can raise intraocular pressure and contribute to cataract formation.

Medications to AVOID in Elderly Patients

- Hydroxychloroquine (Plaquenil): Can cause retinal toxicity with long-term use; requires annual eye exams after 5 years of use.
- Tamsulosin (Flomax) and other alpha-blockers: Can cause Intraoperative Floppy Iris Syndrome (IFIS) during cataract surgery — always inform your eye surgeon.
- Systemic corticosteroids (Prednisone): Long-term use accelerates cataract and glaucoma risk.
- Amiodarone: Can deposit in the cornea; rare optic neuropathy.
- Ethambutol (TB drug): Risk of optic neuropathy.
- Phosphodiesterase-5 inhibitors (Viagra, Cialis): Rarely associated with non-arteritic ischemic optic neuropathy (NAION).

Nutrition and Eye-Healthy Foods

A nutrient-rich diet plays a powerful role in protecting aging eyes and slowing the progression of eye disease.

Eye-Healthy Foods

Leafy Green Vegetables — Spinach, kale, collard greens, Swiss chard

- Rich in lutein and zeaxanthin — powerful antioxidants that protect the macula from light damage and reduce AMD risk.

Fatty Fish — Salmon, sardines, mackerel, trout, herring

- Excellent sources of omega-3 fatty acids (DHA and EPA), which support the retina and reduce dry eye symptoms.

Eggs

- Yolks contain lutein, zeaxanthin, and zinc in a highly bioavailable form.

Orange and Yellow Fruits and Vegetables — Carrots, sweet potatoes, squash, apricots, cantaloupe

- Rich in beta-carotene, which converts to vitamin A — essential for night vision and corneal health.

Citrus Fruits and Bell Peppers

- High in vitamin C, a potent antioxidant that helps protect against cataracts and AMD.

Nuts and Seeds — Almonds, sunflower seeds, hazelnuts, peanuts

- High in vitamin E, which protects cells from oxidative damage.

Legumes — Lentils, chickpeas, black-eyed peas, kidney beans

- Contain zinc and bioflavonoids that support retinal health and protect against AMD and cataracts.

Oysters and Red Meat (in moderation)

- Among the best sources of zinc, which helps transport vitamin A to the retina.

Whole Grains — Brown rice, oats, quinoa, whole wheat

- Low glycemic index foods reduce the risk of AMD. Rich in vitamin E, zinc, and niacin.

Water and Hydrating Foods

- Adequate hydration is essential for maintaining tear production and reducing dry eye.

Foods to Limit or Avoid

Food Category	Reason
Processed and fried foods	High in trans fats and advanced glycation end-products (AGEs); increase AMD risk
High-glycemic foods (white bread, sugary snacks)	Promote oxidative stress; associated with increased AMD and diabetic retinopathy risk
Excessive alcohol	Depletes antioxidant nutrients; associated with higher cataract and AMD risk
High-sodium foods	Contribute to hypertension, which can damage retinal blood vessels
Saturated fats (processed meats, full-fat dairy in excess)	Associated with increased AMD risk in some studies

Daily Habits and Lifestyle Practices

Protect Your Eyes from UV Light

- Wear sunglasses that block 99–100% of both UVA and UVB radiation (look for "UV400" or "100% UV protection" labeling).
- Choose wraparound styles for broader coverage against side exposure.
- Wear a wide-brimmed hat outdoors for additional shade.
- UV exposure increases the risk of cataracts, AMD, and pterygium. This applies even on cloudy days — clouds do not block UV rays.

Manage Chronic Health Conditions

- Diabetes: Maintain tight blood sugar control (target HbA1c below 7% for most patients). High glucose damages retinal blood vessels. Regular dilated eye exams are essential.
- Hypertension: Control blood pressure to protect retinal blood vessels. Hypertensive retinopathy can cause bleeding and vision loss.
- High cholesterol: Linked to retinal vein occlusion and AMD progression.
- Thyroid disease: Graves' disease and thyroid eye disease require monitoring by both an endocrinologist and ophthalmologist.

The 20-20-20 Rule for Screen Use

Extended screen time causes eye strain and reduces blink rate (leading to dry eyes). Every 20 minutes, look at something 20 feet away for at least 20 seconds. This relaxes the focusing muscles of the eye.

Additional tips:

- Adjust screen brightness to match ambient lighting.
- Use "night mode" or blue-light filters in the evening.
- Position screens slightly below eye level and about arm's length away.
- Blink consciously and frequently.
- Consider blue-light blocking glasses if you use screens for many hours a day.

Stop Smoking

Smoking is one of the most significant modifiable risk factors for eye disease.

- Smokers have 2–4 times the risk of developing AMD compared to non-smokers.
- Smoking significantly accelerates cataract formation.
- Smoking damages retinal blood vessels and worsens diabetic retinopathy.

- Even secondhand smoke increases risk.
- Benefits of quitting start within months of stopping and grow over time.

Exercise Regularly
- Regular aerobic exercise (walking, swimming, cycling) has been shown to lower intraocular pressure in glaucoma patients.
- Exercise improves circulation to the optic nerve and retina.
- Helps control diabetes, hypertension, and obesity — all risk factors for eye disease.
- Aim for at least 150 minutes of moderate-intensity exercise per week (per WHO guidelines).

Caution: Heavy weightlifting and certain inverted yoga poses (like headstands) can temporarily raise intraocular pressure. Glaucoma patients should consult their doctor.

Sleep and Eye Rest
- Aim for 7–9 hours of quality sleep per night.
- Sleep allows the eyes to recover from the day's work and replenish nutrients.
- Elevating the head of the bed slightly may reduce intraocular pressure overnight for glaucoma patients.
- Avoid sleeping with contact lenses in (risk of infection).

Proper Eyelid and Eye Hygiene
- Warm compresses on closed eyelids for 5–10 minutes daily help unclog meibomian glands and relieve dry eye.
- Gently massage the eyelids after warm compresses.
- Wash eyelids with a diluted baby shampoo or commercial eyelid wipes to remove debris and reduce blepharitis.
- Avoid touching or rubbing your eyes — this can introduce bacteria, worsen dry eye, and (in rare cases) cause corneal damage.

Medication and Drop Adherence
- Take prescribed eye drops exactly as directed — missing doses (especially in glaucoma) allows pressure to rise and damage the optic nerve.
- For multiple eye drops, wait at least 5 minutes between different drops to prevent washout.
- Use the "nasolacrimal occlusion" technique: After instilling drops, gently press the inner corner of the eye (beside the nose) for 1–2 minutes to reduce systemic absorption and increase ocular contact time.
- Store eye medications properly (some require refrigeration).
- Track refills proactively — never run out of glaucoma drops.

<u>Eye Protection and Assistive Devices</u>

Corrective Lenses
- Keep prescriptions up to date — outdated glasses increase eye strain and falls risk.
- Anti-reflective (AR) coatings reduce glare from screens and headlights, especially helpful for night driving.
- Photochromic (Transitions) lenses darken outdoors and provide automatic UV protection.
- Bifocals and progressive lenses address both distance and near vision needs.

- High-index lenses for strong prescriptions — thinner and lighter.

Low Vision Aids
For vision that cannot be fully corrected with standard glasses:
- Magnifiers: Handheld, stand-mounted, or illuminated; for reading and close work.
- Telescopic spectacles: For distance viewing (e.g., watching TV).
- Electronic magnifiers (CCTV): Screen-based magnification for reading.
- Smartphones and tablets: Built-in accessibility features (zoom, high contrast, voice-over/TalkBack).
- E-readers: Adjustable text size; high contrast settings.
- Screen readers and voice assistants: Amazon Echo, Siri, Google Assistant for hands-free information.
- Large-print books, phone keypads, and clocks.
- Audio books and podcasts.

Protective Eyewear
- Wear safety glasses or goggles during home improvement projects, gardening, and sports.
- Use splash goggles when working with chemicals or cleaning products.
- Anti-fog goggles for winter activities.
- Wear helmets with visors for cycling and motorcycling.

Driving and Night Vision
- Have vision assessed regularly — many states require a certain visual acuity for driving.
- Avoid driving at night if night vision is significantly impaired.
- Use anti-glare coatings on windshields and eyeglasses.
- Keep the car windshield clean inside and out to reduce glare scatter.
- Allow extra time for eyes to adjust when entering or leaving bright/dark environments.