AAVBC

AMERICAN ACADEMY OF VALUE BASED CARE

Adult Macular Degeneration Quick Reference Guide

2026

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1 CLINICAL SNAPSHOT

Definition: Age-related macular degeneration (AMD) is a leading cause of **severe**, **irreversible vision impairment** and **legal blindness** in adults over 65 in the United States, responsible for an estimated **46%** of cases of severe visual loss (VA 20/200 or worse) in people over age 40.[1,2] AMD progresses through **drusen accumulation** and **retinal pigment epithelium changes**; approximately **80%** of cases are nonexudative (**dry**) AMD, while the neovascular (**wet**) form, though less common, is responsible for nearly **90%** of severe vision loss from AMD due to choroidal neovascularization.[1,2]

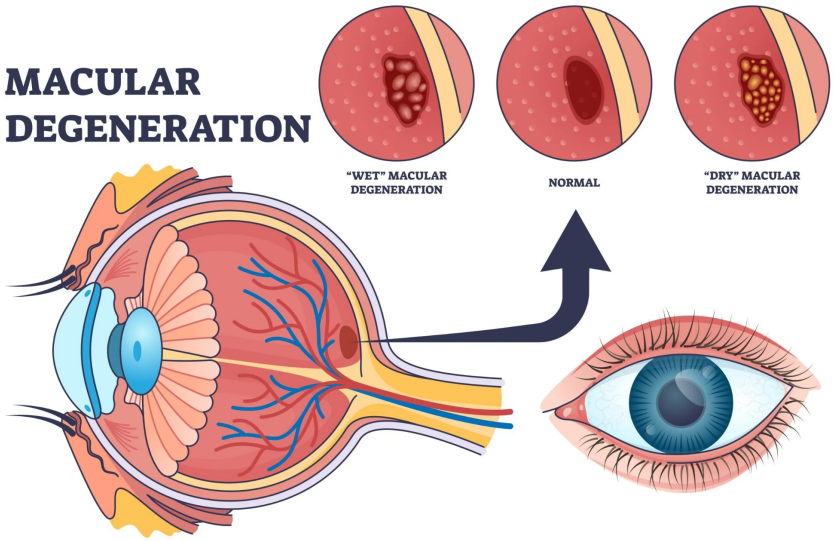
Critically, dry AMD **is not a single, static diagnosis**: it spans a spectrum from **early** (medium drusen, no intervention) through **intermediate** (large drusen or pigmentary changes, warranting AREDS2 supplementation and monitoring) to **advanced geographic atrophy** (**GA**), which now has two FDA-approved complement inhibitors (pegcetacoplan (Syfovre) and avacincaptad pegol (Izervay)).[1,2]

Intermediate dry AMD carries meaningful **risk of conversion** to wet AMD, estimated at approximately **10% per year** in fellow eyes of patients with unilateral neovascular AMD, and that conversion is **time-sensitive**: treatment **within 14 days** of wet AMD onset substantially **preserves vision**, whereas in a prospective study of 185 patients, those treated within 7 weeks had a **38%** improvement rate at 6 months compared with **only 20%** when treatment was delayed beyond 21 weeks.[2,3]

ICD-10 Code:

H35.31xx (Nonexudative/Dry AMD) with 5th-character laterality and 6th-character stage; **H35.32xx** (Exudative/Wet AMD) with 5th-character laterality and 6th-character CNV activity status; **H35.30** (Unspecified) = **AVOID** (no HCC mapping, loses clinical specificity).[4] **Laterality**: **1**=right, **2**=left, **3**=bilateral, **9**=unspecified. **Dry AMD stages**: **0**=unspecified, **1**=early, **2**=intermediate, **3**=advanced atrophic w/o subfoveal GA, **4**=advanced atrophic w/ subfoveal GA.[4] **Wet AMD activity**: **0**=unspecified, **1**=active CNV, **2**=inactive CNV, **3**=inactive scar. **Example**: **H35.3122** = Nonexudative AMD, left eye, intermediate stage; **H35.3231** = Exudative AMD, bilateral, active CNV.[4] **When drusen are the sole finding without staged AMD**, report **H35.36-** (drusen, degenerative, macula) with laterality suffix; **once AMD is staged**, code to the specific **H35.31-** or **H35.32-** subcode instead.[4] Concurrent **functional vision loss codes** must also be documented: **H54.0X-** (blindness both eyes), **H54.1-** (blindness one eye/low vision other), **H54.2X-** (low vision both eyes), **H54.4-/H54.5-** (unilateral blindness or low vision), and **H54.8** (legal blindness USA, ≤20/200 or field ≤20°).[4] **Code concurrent complications**: **H53.411–H53.419** (central scotoma), **H53.15** (metamorphopsia/visual distortion), **H35.72-** (serous RPE detachment), **H35.73-** (hemorrhagic RPE detachment), and **H35.81** (retinal edema/CME) when documented.

Prevalence: Approximately **20 million** U.S. adults aged ≥40 years live with **any stage** of age-related macular degeneration, including **~1.49 million** with **vision-threatening late AMD**; prevalence rises to **~12–15%** among adults ≥65 and **~11.4%** among adults ≥85.[1,2,5,6] Most early and intermediate AMD is **asymptomatic** and is identified only on dilated fundus examination, creating a **meaningful awareness gap** that PCPs are positioned to close through **timely screening referral**.[6,10]



HCC/RAF V28 Mapping

ICD-10 CODE(S)[4]	HCC CATEGORY (V28)[7]	RAF WEIGHT (CNA)*[8]	DOCUMENTATION REQUIREMENT[4]
H35.32x[1] (wet AMD, active CNV)	**HCC 300** Exudative Macular Degeneration	0.596	**Laterality + CNV activity status** (active) documented at each visit; anti-VEGF **injection frequency** and **response** documented; imaging (OCT/FA/OCTA) reviewed and referenced
H35.32x[2] (wet AMD, inactive CNV)	**HCC 300** Exudative Macular Degeneration	0.596	**Laterality + CNV inactivity status** explicitly documented; **time since last injection**; stable VA or VA trend; imaging evidence of drying/stability
H35.31x3 (advanced dry AMD, no subfoveal GA)	No HCC	—	**Laterality + stage** documented; imaging evidence (OCT/FA) noted; **functional impact** (vision loss, driving status) assessed

ICD-10 CODE(S)[4]	HCC CATEGORY (V28)[7]	RAF WEIGHT (CNA)*[8]	DOCUMENTATION REQUIREMENT[4]
H35.31x4 (advanced dry AMD, with subfoveal GA)	No HCC	—	**Laterality + subfoveal involvement** explicitly documented; **OCT** or **OCT-A** confirmation; monitor for GA progression; treatment initiation (pegcetacoplan/ avacincaptad) noted
H35.30 (unspecified macular degeneration)	No HCC	—	**AVOID**: non-specific code → document type (dry vs. wet), stage (if dry), laterality, and CNV activity (if wet) **to enable H35.31xx or H35.32xx coding**
H35.311x/H35.312x (early/intermediate dry AMD)	No HCC	—	Document **stage** and **laterality**; monitor for progression to advanced (**H35.313x/x4**); initiate AREDS2 at intermediate stage; annual dilated exam

ABBREVIATIONS: AMD = age-related macular degeneration; HCC = hierarchical condition category; RAF = risk adjustment factor; CNA = Community Non-Dual Eligible Aged; OCT = optical coherence tomography; FA = fluorescein angiography; GA = geographic atrophy; OCT-A = OCT angiography; CNV = choroidal neovascularization; VEGF = vascular endothelial growth factor; OCTA = optical coherence tomography angiography; VA = visual acuity; AREDS2 = Age-Related Eye Disease Study 2; ICD-10 = International Classification of Diseases, 10th Edition; CMS-HCC = Centers for Medicare & Medicaid Services Hierarchical Condition Category; VBC = value-based care
***RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model;[8] values vary across patient populations based on eligibility and care setting**

Risk-Adjusted Care Resources per Patient/Year[7,8]

Risk-adjusted care resource allocation — MA base rate (~$10,402.34) × RAF coefficient

WET AMD

$6.2K

HCC 300 · RAF 0.596

AAVBC PERSPECTIVE

From the AAVBC's perspective, value-based care in age-related macular degeneration (AMD) *begins with* ***preventing avoidable vision loss*** *through early recognition and coordinated management rather than passive observation. Primary care* ***should not*** *normalize progressive vision changes as "just aging." Patients with* ***AMD signs****,* ***symptoms****, or* ***risk factors*** *require* ***timely retinal evaluation****, with same-day specialist contact when symptoms suggest conversion to neovascular (wet) AMD. PCPs should also ensure evidence-based interventions, including* ***AREDS2 supplementation*** *when appropriate,*

smoking cessation, and optimization of cardiovascular risk factors, to help preserve vision and functional independence.[1,2,9]

***The PCP's role extends well beyond referral**. In older adults, AMD is frequently accompanied by depression, fall risk, transportation barriers, and treatment burden associated with serial anti-VEGF injections.*[10–12] *These factors can **undermine adherence** and **accelerate disability** if left unaddressed.*[13,14] *Primary care should r**outinely assess these barriers**, coordinate longitudinal support, and document **shared decision-making** regarding treatment goals and access to care. As ophthalmology increasingly adopts **extended-interval injection protocols**, **home monitoring technologies**, and **integrated geriatric care models**, **clinicians should support** patient-centered, clinically appropriate options, including lower-cost therapies such as bevacizumab when indicated, reinforcing accountability and **high-value AMD management**.*

2 RECOGNITION AND DIAGNOSIS

Medicare Diagnostic Workup and Surveillance (Older Adults, At-Risk Population)

Age-related macular degeneration (AMD) affects ~20 million U.S. adults aged ≥40, yet most early and intermediate disease is **asymptomatic** and **detected only on dilated fundus examination**.[2,9] **There is no population-based screening test for AMD**; evaluation is **symptom-**, **risk-factor-**, or **age-triggered** per AAO guidelines.[1,9] Coverage applies to diagnostic workup and monitoring when medically necessary. **Medicare Part B covers the following diagnostic tests and monitoring**:

TEST	FREQUENCY[1,2]	CPT CODE(S)	CLINICAL INDICATION[1,2,15,16]
Comprehensive dilated fundus exam (biomicroscopy, fundus photography)†	**Annually** for ages 65+; **every 6–24 mo** if stable early AMD; sooner if new symptoms	92004 (new pt), 92014 (est pt), 92250 (fundus photo)	**Baseline AMD detection/staging**; drusen size, pigmentary changes, RPE atrophy, exudation signs
Optical coherence tomography (OCT)‡	**Each visit** for intermediate/ advanced AMD; **q4–8 wk** during active wet AMD Tx; individualized for GA	92134	**Gold standard for retinal fluid detection** (91.7% sensitivity vs. FFA); macular thickness, GA area, anti-VEGF response monitoring

TEST	FREQUENCY[1,2]	CPT CODE(S)	CLINICAL INDICATION[1,2,15,16]
OCT angiography (OCTA)§	**As indicated** for intermediate/ advanced AMD; not routine screening	92134 (billed as OCT imaging)	**Noninvasive MNV detection** (sensitivity 0.87, specificity 0.97); differentiates wet from dry; emerging FFA alternative
Fluorescein angiography (FFA)	Selected cases: **wet AMD Dx**, Tx planning, OCT/OCTA inconclusive; **not routine**	92235	**CNV leakage pattern classification** (classic vs. occult); largely replaced by OCT for routine monitoring
Fundus autofluorescence (FAF)	**At Dx** and serially for GA monitoring; **as indicated** for intermediate AMD	92250 (fundus imaging)	**GA lesion area quantification** and **progression tracking**; FAF patterns predict enlargement rate
Amsler grid (home monitoring)	**Daily** self-testing; reviewed at each visit	No CPT	**Detects metamorphopsia** (wet AMD conversion); sensitivity **71%**, specificity **63%¶**
Home fundus monitoring	**Per protocol** (~5 min/day); patient reports change to specialist	99457–99458 (remote monitoring)	**Early nAMD conversion detection**; **HOME study**: −4 letter loss (device) vs. −9 (standard care); **82%** retained ≥20/40

ABBREVIATIONS: AMD = age-related macular degeneration; RPE = retinal pigment epithelium; OCT = optical coherence tomography; GA = geographic atrophy; Tx = treatment; VEGF = vascular endothelial growth factor; OCTA = OCT angiography; MNV = macular neovascularization; FFA = fundus fluorescein angiography; Dx = diagnosis; CNV = choroidal neovascularization; FAF = fundus autofluorescence; nAMD = neovascular AMD; CPT = Current Procedural Terminology; AAO = American Academy of Ophthalmology; PPP = Preferred Practice Pattern; QALY = quality-adjusted life year; ICER = incremental cost-effectiveness ratio

†AAO PPP: return exam at 6–24 mo for stable early AMD; every 6–12 mo for high-risk fellow eyes; prompt exam for any new symptoms suggestive of CNV

‡OCT is the primary monitoring modality at each anti-VEGF treatment visit; for GA, OCT + FAF tracks lesion progression per complement inhibitor protocols (pegcetacoplan q25–60 days, avacincaptad pegol q28 days)

§OCTA billed under 92134; no unique CPT code. Coverage may vary by payer/locality

¶Amsler grid misses ~1 in 3 converted eyes; regular ophthalmic exam should not be deferred based on a negative result

Dry (Nonexudative) vs. Wet (Neovascular) AMD — Key Differences for PCPs

FEATURE	DRY (NONEXUDATIVE) AMD[1,2,9]	WET (NEOVASCULAR) AMD[1,2,9]
Primary diagnostic modality	**Dilated fundus exam** + OCT; FAF for GA staging	**OCT** (first-line) + FFA or OCTA for CNV confirmation

FEATURE	DRY (NONEXUDATIVE) AMD[1,2,9]	WET (NEOVASCULAR) AMD[1,2,9]
OCT findings	**Drusen**, RPE irregularities, subretinal drusenoid deposits; in advanced GA: loss of RPE and photoreceptor layers (cRORA)	Intraretinal fluid (IRF), subretinal fluid (SRF), pigment epithelial detachment (PED), sub-RPE neovascular membrane
Fluorescein angiography role	Generally **not required**; no leakage to detect	**Reference standard** for confirming CNV activity, **classifying leakage pattern** (type 1/occult, type 2/classic, type 3/RAP), and guiding treatment eligibility
OCTA role	Maps **choriocapillaris loss in GA**; identifies subclinical MNV in intermediate AMD	**Detects and characterizes neovascular networks noninvasively** (sensitivity 0.87, specificity 0.97); emerging alternative to FFA
FAF role	**Primary modality for GA detection**, lesion area measurement, and progression monitoring; FAF patterns predict enlargement rate	**Limited primary role**; may show blocked fluorescence from hemorrhage or fluid
Urgency of referral	**Routine referral** for baseline staging; 6–24 month follow-up intervals for stable disease	**Urgent/same-day specialist contact**; treatment within 14 days of symptom onset preserves vision
Monitoring frequency	Every **6–24 months** (early); every **6–12 months** (intermediate/high-risk fellow eye); individualized for GA on treatment	Every **4–8 weeks** during active treatment (anti-VEGF loading and maintenance); treat-and-extend protocols may extend to **12–16 weeks** once stable
Home monitoring role	**Amsler grid daily**; other home monitoring devices for high-risk intermediate AMD (large drusen + pigmentary changes) to **detect conversion**	Amsler grid daily **between injection visits** to detect recurrence; OCT-based home monitoring emerging
Key PCP action	Ensure **AREDS2 supplementation** for intermediate AMD; **smoking cessation**; annual dilated exam referral; educate on Amsler grid use	**Ensure urgent referral** for any new metamorphopsia, scotoma, or acute vision change; support **treatment adherence** (injection schedule, transportation)

ABBREVIATIONS: AMD = age-related macular degeneration; OCT = optical coherence tomography; FAF = fundus autofluorescence; GA = geographic atrophy; FFA = fundus fluorescein angiography; OCTA = OCT angiography; CNV = choroidal neovascularization; RPE = retinal pigment epithelium; cRORA = complete RPE and outer retinal atrophy; IRF = intraretinal fluid; SRF = subretinal fluid; PED = pigment epithelial detachment; RAP = retinal angiomatous proliferation; MNV = macular neovascularization; VEGF = vascular endothelial growth factor; PCP = primary care physician; AREDS2 = Age-Related Eye Disease Study 2

CLINICAL PEARL: DRY-TO-WET AMD CONVERSION — A TIME-SENSITIVE EMERGENCY

Approximately **10–20%** of non-exudative AMD cases convert to the exudative (wet) form, which accounts for ~80% of severe AMD-related vision loss.[1,17] Risk is highest in **intermediate AMD**: AREDS data show **~18% progression** to advanced AMD at 5 years overall for intermediate disease, rising to **26%** with bilateral large drusen and **35–50%** when the fellow eye already has advanced AMD.[1] **Conversion is time-sensitive**: in a prospective study of 185 patients, those treated **within 7 weeks** had **38%** vision improvement at 6 months versus only **20%** when delayed **beyond 21 weeks**; ideally, anti-VEGF therapy should begin **within 14 days of diagnosis**.[2] Cardinal warning signs **PCPs should educate patients about**: new-onset **metamorphopsia** (wavy lines), **central scotoma**, sudden **blurred vision**, or **difficulty reading/recognizing faces** → prompts same-day specialist contact, **not routine referral**.[2,18] **Daily Amsler grid self-testing** detects metamorphopsia but has **limited sensitivity** (**~71%**); a negative result **should not defer examination** when clinical suspicion exists.[15]

Subtle Early Signs in Older Adults

SIGN/SYMPTOM[1,2]	CLINICAL SIGNIFICANCE[1,2,19,20]
Metamorphopsia (wavy or distorted straight lines; Amsler grid positive)	**CARDINAL SIGN of wet AMD conversion** or active CNV → requires **same-day retinal specialist contact**; anti-VEGF **within 14 days** preserves vision, delays >7 wk reduce improvement from 38% to 20%; **acute onset is urgent**
Scotoma (dark or blank spot in central vision)	**May indicate GA in dry AMD** (slow onset, expanding over months–years) or **CNV in wet AMD** (acute onset) → functional impact on reading and face recognition; screen for depression and fall risk; **assess VA and refer for imaging**
Decreased color perception or dimmer vision (particularly low-light)	**Early progression sign**; reduced color saturation from photoreceptor loss; not immediately urgent but indicates need for closer monitoring interval and retinal evaluation
Difficulty reading or performing fine visual tasks despite adequate lighting	**Functional decline** in intermediate/advanced dry or wet AMD → **assess need for**: low-vision rehabilitation, magnification aids, and home safety assessment (falls)
Driving difficulty or unsafe driving (near-misses, hesitation in low light)	**Functional outcome marker**; **71%** of bilateral GA patients **ineligible to drive** at initial diagnosis; screen at each visit; coordinate OT referral; assess for depression and social isolation
No symptoms despite positive fundus findings (asymmetric or early unilateral disease)	Early AMD or early unilateral wet AMD may be **asymptomatic** → discovered on routine dilated exam; **fellow-eye** nAMD risk **~40%** at 5 yr; initiate monitoring protocol and **AREDS2 if intermediate stage**

SIGN/SYMPTOM[1,2]	CLINICAL SIGNIFICANCE[1,2,19,20]

ABBREVIATIONS: AMD = age-related macular degeneration; CNV = choroidal neovascularization; VEGF = vascular endothelial growth factor; GA = geographic atrophy; VA = visual acuity; OT = occupational therapy; nAMD = neovascular AMD; AREDS2 = Age-Related Eye Disease Study 2

Geriatric Risk Factors

FACTOR	RISK SIGNAL	NOTES
Advanced age	**Strongest AMD risk factor**; incidence rises sharply **after age 60**; genetic susceptibility compounds with aging[1,9]	**Comprehensive eye exams every 1–2 years** for adults ≥65 per AAO PPP; counsel on **Amsler grid** self-monitoring[1,9]
Smoking	**Most important modifiable risk factor** (OR ~1.9); dose-response with pack-years; risk normalizes **~20 years after cessation**[1]	**Counsel cessation at every visit**; if AREDS2 supplementation is needed, always use the **beta carotene–free formulation** for current/former smokers[1,23]
Race and ethnicity	AMD prevalence highest in **European-ancestry populations** (~12%); late AMD incidence **~10×** higher in White vs Black adults (MESA); geographic atrophy prevalence **~5–8×** higher in White patients[20,24]	**Document as a risk modifier**; White patients warrant earlier screening; **do not** defer evaluation in other racial groups[23]
Sex	Overall incidence **similar between sexes**; women may have higher neovascular AMD risk **after age 75** (OR ~2.0); meta-analysis: female sex OR 1.19[24,25]	Consider **closer wet AMD monitoring** in women >75; ensure equitable screening regardless of sex
BMI and obesity	**BMI ≥30** associated with **32%** increased late AMD risk (RR 1.32); higher BMI linked to earlier onset of advanced disease by **~1.7 years**[9,25]	Counsel **weight management** alongside cardiovascular risk factor optimization
Diet	Mediterranean diet adherence **reduces advanced AMD** risk up to **41%**; fish ≥2×/week and leafy greens independently protective; benefits **complement AREDS2 supplements**[1,26]	**Recommend Mediterranean-style diet**; emphasize **dietary omega-3** from food (supplemental omega-3 showed no benefit in AREDS2)[26]
UV and sunlight exposure	Pooled OR 1.38 for AMD with **greater sunlight exposure**; evidence inconsistent with no clear dose-response; classified as "less robust" evidence[1,20]	**Counsel UV-blocking sunglasses** and wide-brimmed hats as **reasonable precautions**; not a major established risk factor per AAO PPP[1]

FACTOR	RISK SIGNAL	NOTES
Eye color	**Light iris color** associated with early AMD (OR ~1.5–1.7) in some cohorts; associations with late AMD **inconsistent after adjustment**; classified as "less robust"[20,27]	Note as a minor **non-modifiable modifier**; **do not** use iris color alone to drive screening; largely subsumed by race/ethnicity and genetics[20]
Hypertension and CVD	**Hypertension** (OR 1.24), **CVD** (OR 1.44), and **diabetes** (OR 1.44) each independently associated with AMD[1,25]	**Optimize BP and glycemic control**; AAO PPP recommends **addressing modifiable cardiovascular risk factors** as part of AMD care[1]
Polypharmacy	AREDS2 zinc (80 mg) requires **copper co-supplementation** to prevent deficiency anemia; **zinc interacts with**: iron, calcium, fluoroquinolones*[1,9]	Review **supplement–drug interactions** at medication reconciliation; anti-VEGF injections **do not** require anticoagulant discontinuation*[1,9]
Transportation barriers	Greater travel distance and caregiver dependence each **increase loss to follow-up risk** (~2× OR); up to **50% discontinue** anti-VEGF by 24 months[1,28]	**Coordinate medical transport benefits**; favor extended-interval treatment regimens to reduce visit burden[1,28]

ABBREVIATIONS: AMD = age-related macular degeneration; HR = hazard ratio; PT = physical therapy; OT = occupational therapy; AREDS2 = Age-Related Eye Disease Study 2; VEGF = vascular endothelial growth factor; ATE = arterial thromboembolic event; ADL = activities of daily living; PHQ-9 = Patient Health Questionnaire–9; MoCA = Montreal Cognitive Assessment; PRN = pro re nata (as needed); LTFU = loss to follow-up; OR = odds ratio
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Diagnostic Thresholds

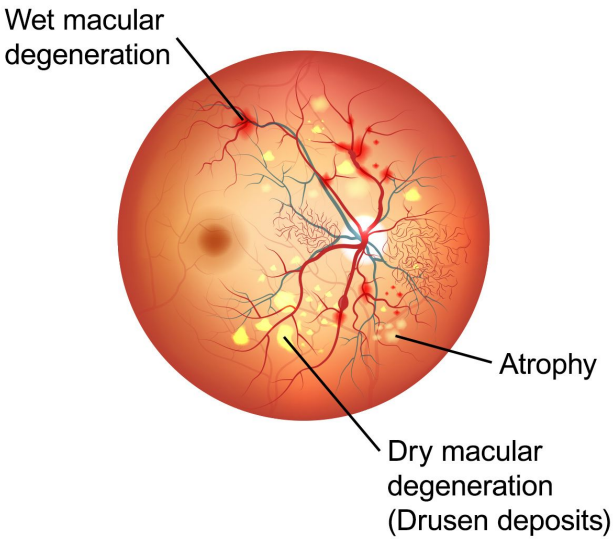
AMD diagnosis in U.S. primary care relies on a **stepwise approach**: clinical history and dilated fundus examination **identify drusen and pigmentary changes**, the **Beckman classification** or **AREDS** simplified severity scale **stratifies disease stage**, and imaging (OCT, OCTA, fluorescein angiography) confirms **disease type** and **guides treatment**.[1,9,20] For older adults, two key challenges **modify this pathway**: early and intermediate AMD are **typically asymptomatic** and **detectable only on dilated exam**, and conversion to wet AMD is **time-sensitive**: treatment **within 14 days** of initial diagnosis substantially preserves vision, while delays from first symptoms to treatment **beyond 7 weeks** reduce improvement from ~38% to ~20%.[2] Once AMD is staged, the **AREDS simplified severity scale** quantifies **5-year progression risk** and identifies patients who benefit from **AREDS2 supplementation**, a decision the AAO PPP recommends for all patients with **intermediate AMD** or **advanced AMD in one eye**.[1,9]

Primary Staging System: Beckman Classification

The **Beckman classification** is the standard clinical framework for AMD staging, based on **drusen size** and **pigmentary abnormalities** assessed within 2 disc diameters of the fovea.[29] Small drusen (**<63 µm**) are considered **normal aging**.[29] **Early AMD** is defined by medium drusen (63–125 µm) without pigmentary abnormalities.[29] **Intermediate AMD** is defined by large drusen (≥125 µm) and/or at least three medium drusen or any pigmentary abnormalities with at least medium drusen; this is the threshold at which **AREDS2 supplementation is indicated**.[1,29] **Late AMD** encompasses **both** geographic atrophy and neovascular AMD.[29] **For PCPs**, the critical distinction is

between intermediate AMD (actionable → start AREDS2, refer to retinal specialist) and early AMD (monitor only, no intervention).[1,9]

Wet and dry macular degeneration



Beckman Classification of AMD

CLASSIFICATION	DRUSEN	PIGMENTARY ABNORMALITIES	PCP ACTION
No AMD (normal aging)	**None** or **small only** (≤63 µm, "drupelets")	None	**No intervention**; routine eye care
Early AMD	**Medium** (≥63 µm to <125 µm)	None	**Monitor**; no AREDS2; dilated exam **every 1–2 years**
Intermediate AMD	**Large** (≥125 µm), or **any size** with **pigmentary abnormalities**	Present or absent (if large drusen)	**Start AREDS2**; refer to retinal specialist **within 3–6 months**; 5-year late AMD risk **~12–50%** depending on severity score
Late AMD — Geographic Atrophy	**RPE and photoreceptor atrophy**; sharply demarcated depigmented areas	RPE loss	**Complement inhibitor eligibility assessment**; quantify GA area (mm^2) on OCT/FAF; **low-vision rehab referral**

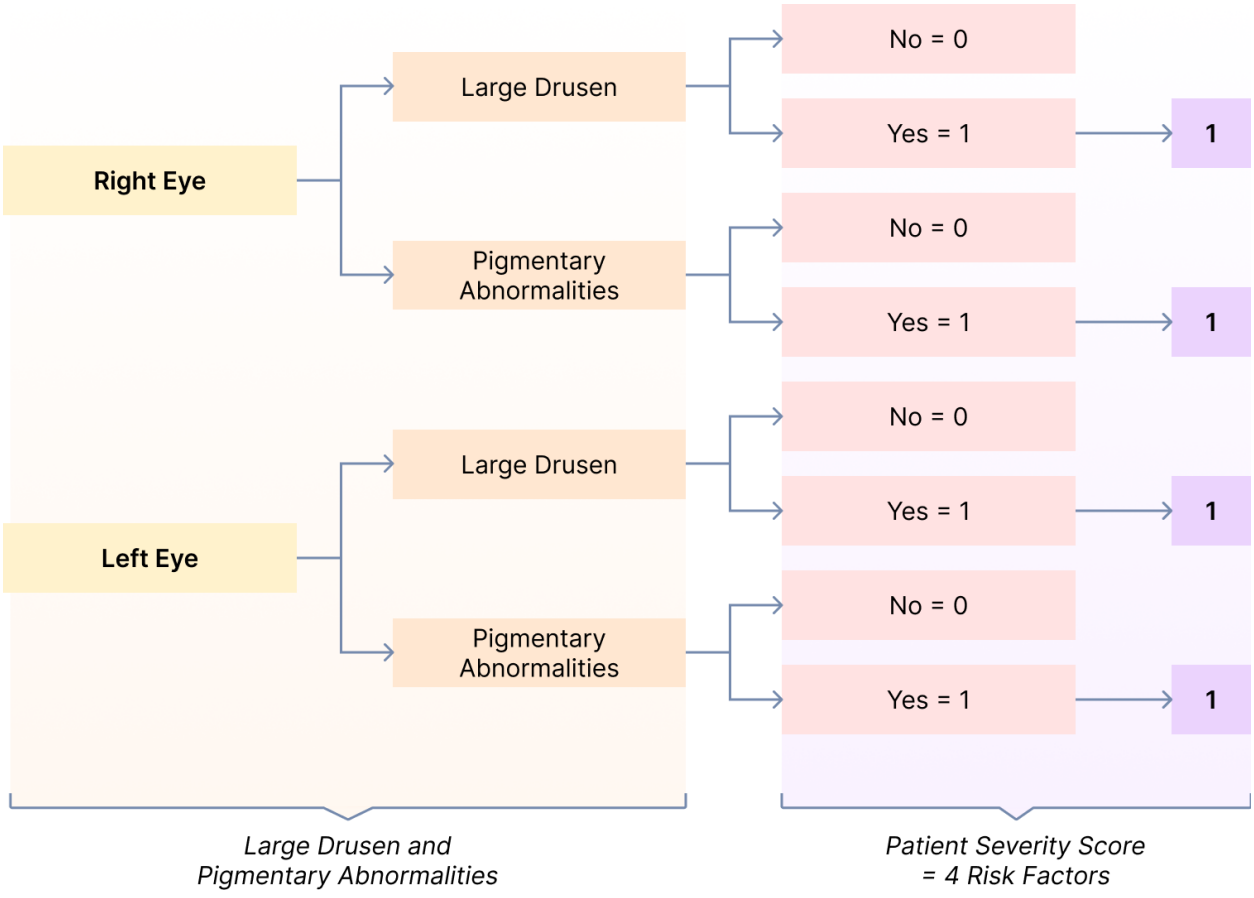
CLASSIFICATION	DRUSEN	PIGMENTARY ABNORMALITIES	PCP ACTION
Late AMD — Neovascular (Wet)	**CNV with**: subretinal/ intraretinal fluid, hemorrhage, hard exudates	Variable	**URGENT**: **same-day specialist contact**; anti-VEGF **within 14 days** of symptom onset

ABBREVIATIONS: AMD = age-related macular degeneration; PCP = primary care physician; AREDS2 = Age-Related Eye Disease Study 2; RPE = retinal pigment epithelium; GA = geographic atrophy; OCT = optical coherence tomography; FAF = fundus autofluorescence; CNV = choroidal neovascularization; VEGF = vascular endothelial growth factor

Primary Progression Risk Tool: AREDS Simplified Severity Scale

The **AREDS simplified severity scale** assigns 1 point per eye for large drusen (≥125 µm) and 1 point per eye for pigmentary abnormalities, yielding a 0–4 score.[1,30] Five-year progression rates to late AMD are approximately: score **0** → 0.5%, score **1** → 4%, score **2** → 12%, score **3** → 25%, score **4** → 50%.[31] A 2024 update incorporating **reticular pseudodrusen** (**RPD**) approximately **doubles progression rates** at most levels **when RPD is present** (e.g., score **3 with RPD** → **~59%** vs. **~27%** without RPD).[1,31] This scale directly informs AREDS2 supplementation decisions and specialist referral urgency.[1]

AREDS AMD Simplified Severity Scale

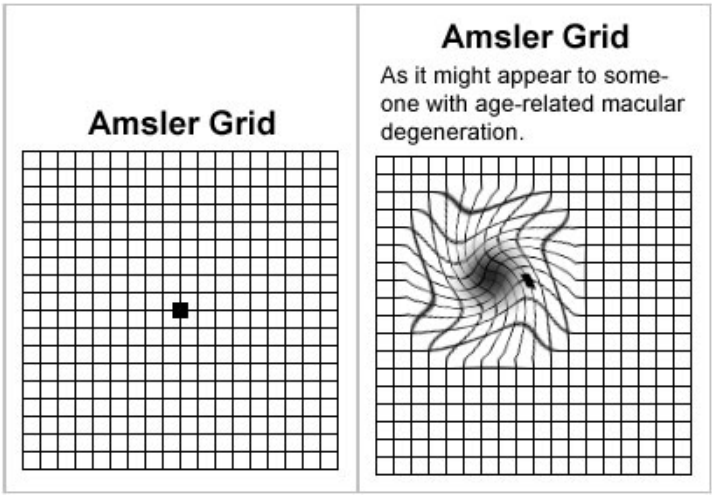


Primary Imaging Modality: Optical Coherence Tomography (OCT)

OCT is the most widely used noninvasive imaging modality for AMD diagnosis and monitoring across all stages.[1,9] It provides noninvasive, high-resolution cross-sectional imaging of retinal architecture, **quantifying**: macular thickness, intraretinal and subretinal fluid (wet AMD), drusenoid deposits, and GA area (mm^2).[1,2,20] In the **EDNA study** (552 patients, 3-year follow-up), OCT had **91.7% sensitivity** for detecting neovascular conversion **in fellow eyes**, substantially **outperforming** Amsler grid (33.7%), visual acuity testing (30.0%), and fundus examination (53.8%).[32] OCT is the primary tool for **monitoring anti-VEGF treatment response** and **GA progression rate**.[1,9]

Home Monitoring Tool: Amsler Grid

The **Amsler grid** is a patient-administered daily screening tool for **metamorphopsia** (wavy/distorted lines), the cardinal symptom of **wet AMD conversion**.[1,15] In a 2023 JAMA Ophthalmology meta-analysis, when tested against patients with nonneovascular AMD (the clinically relevant scenario), the grid had **71%** sensitivity and **63%** specificity, missing approximately **1 in 3 neovascular conversions**, largely because nonneovascular AMD itself can cause **metamorphopsia that produces false positives**.[15] Despite moderate accuracy, a positive Amsler grid in a patient with **known dry AMD** should trigger **same-day retinal specialist contact**; the AAO PPP emphasizes that regular ophthalmic examination remains necessary **regardless of grid results**.[1] FDA-cleared home monitoring devices enable earlier CNV detection with **less VA loss at diagnosis** (median **−4** vs. **−9** letters, HOME study), though no statistically significant difference in diagnostic accuracy versus the Amsler grid has been demonstrated, and real-world compliance remains a limitation.[15,16]



Other Relevant Diagnostic and Monitoring Tools

SYSTEM	KEY FEATURES	PRIMARY USE
Fluorescein angiography (FFA)[1,2]	**Intravenous dye study**; classifies CNV as classic (type 2) or occult (type 1); **detects leakage pattern and activity**; gold standard for **CNV characterization**	**Wet AMD diagnosis and treatment planning** when OCTA is inconclusive or unavailable

SYSTEM	KEY FEATURES	PRIMARY USE
OCT angiography (OCTA)[1,2]	**Noninvasive**; no dye required; detects neovascular networks (MNV types 1, 2, 3); sensitivity **0.87**, specificity **0.97** for **MNV detection**; does not detect leakage	**Wet AMD neovascular characterization**; non-exudative MNV detection; GA choriocapillaris assessment
Fundus autofluorescence (FAF)[2]	**Maps GA borders with high precision**; quantifies GA area and **progression rate** (avg ~2 mm^2/year); accepted by regulatory authorities as primary endpoint in GA trials	**GA monitoring and progression measurement**; complement inhibitor treatment response
Visual acuity (ETDRS/ Snellen)[1,2]	**Serial per-eye measurements**; **≥15-letter loss** = moderate visual loss; **≥30-letter loss** = severe; tracks treatment response and functional decline	**Baseline and follow-up outcome measure**; functional status documentation; driving eligibility
Color fundus photography[1,2]	**Documents**: drusen size/number, pigmentary changes, hemorrhage, exudates; enables **comparison across visits**; widely available	Baseline documentation; **longitudinal comparison**; teleretinal screening programs

ABBREVIATIONS: AMD = age-related macular degeneration; CNV = choroidal neovascularization; FFA = fluorescein angiography; OCTA = OCT angiography; OCT = optical coherence tomography; MNV = macular neovascularization; GA = geographic atrophy; FAF = fundus autofluorescence; ETDRS = Early Treatment of Diabetic Retinopathy Study; VEGF = vascular endothelial growth factor

CLINICAL PEARL: CRITICAL CLINICAL INSIGHT

Dry AMD is NOT a watch-and-wait condition. Intermediate dry AMD requires **active intervention**: **AREDS2 supplementation** (***25% reduction in 5-year progression*** to advanced AMD), regular dilated exams, **home Amsler** or electronic monitoring, and **direct patient education** about wet AMD conversion symptoms.[1,9] Wet AMD is a **time-sensitive condition** requiring **urgent treatment**: anti-VEGF therapy should **ideally begin within 14 days of diagnosis**.[2] In a prospective study of 185 patients, those treated **within 7 weeks of symptom onset** had a **38%** rate of vision improvement at 6 months, compared with **only 20%** among those with **delays of 21 weeks or more** (OR 2.62 for worsening vision with longer delay).[2,33] **The PCP role is critical**: identify conversion symptoms (metamorphopsia, scotoma), coordinate same-day specialist access, ensure treatment adherence, and **support functional preservation**.[2]

Common Oversights

OVERSIGHT/SHORTCUT	WHY IT MATTERS — WHAT TO DO INSTEAD[1,2,20,34]
Diagnosing AMD as "cataracts" or attributing central vision loss to refractive error	AMD causes **central distortion** (metamorphopsia, scotoma), **not diffuse blur** → dilated exam + OCT in all patients ≥65 with vision complaints
Intermediate dry AMD without AREDS2 supplementation	**25%** 5-year progression risk **without intervention**; AREDS2 reduces by **~25%** → initiate at intermediate stage; OTC, low cost
Not rechecking Amsler grid and VA at every AMD visit	**Silent conversion to wet AMD** or **GA expansion missed** → build into visit template; new metamorphopsia or ≥3-line VA loss = **same-day specialist contact**
No urgent specialist referral pathway for wet AMD	Wet AMD requires retinal specialist **within days**; intermediate **within 1–2 years** → establish referral agreement; **flag high-risk patients** for expedited booking
Overlooking depression, falls, and functional decline	Depression **HR 1.15–1.28**; falls and ADL decline common → PHQ-9, falls screen, and functional assessment at each visit; **refer PT/OT and low-vision rehab**
Ignoring smoking status	**Largest modifiable AMD risk factor**; cessation reduces risk over time → document and offer counseling/pharmacotherapy at every visit

ABBREVIATIONS: AMD = age-related macular degeneration; OCT = optical coherence tomography; AREDS2 = Age-Related Eye Disease Study 2; OTC = over-the-counter; VA = visual acuity; GA = geographic atrophy; HR = hazard ratio; ADL = activities of daily living; PHQ-9 = Patient Health Questionnaire–9; PT/OT = physical/occupational therapy

Key Differentials in Elderly

PRESENTATION	DIFFERENTIAL[9,19,35]	KEY TESTS[1,2]
Central scotoma or metamorphopsia + drusen and/or retinal atrophy on dilated exam	**AMD** (dry ± GA, wet ± CNV) vs. **other drusen-like conditions** (Stargardt, pattern dystrophy, vitelliform lesions) vs. other central loss (optic neuropathy, CRAO, posterior subcapsular cataract)	**OCT** (retinal structure, fluid); **FFA/OCTA** (CNV vs. atrophy); **ERG** if inherited disorder suspected; visual field
Acute vision loss + metamorphopsia + exudative findings (fluid, hemorrhage, exudates)	**Wet AMD** with active CNV vs. **retinal detachment** vs. **CRVO** (diffuse hemorrhages) vs. diabetic macular edema (bilateral, diabetes history) vs. central serous chorioretinopathy	**Urgent OCT** (fluid location); **FFA/OCTA** (CNV type); dilated exam (disc, periphery); diabetes history

PRESENTATION	DIFFERENTIAL[9,19,35]	KEY TESTS[1,2]
Slow progressive central loss over months–years + large drusen or GA, no exudative features	**Dry AMD ± GA** vs. **glaucoma** (field pattern, IOP) vs. **macular dystrophy** (younger onset, family history) vs. drug toxicity retinopathy	**OCT** (GA area, RPE changes); **OCTA** (rule out occult CNV); visual field; IOP; family history
Bilateral central loss + GA on imaging	**Advanced bilateral dry AMD**; high fellow-eye wet conversion risk (RR 2.34 within 36 months) vs. **hereditary dystrophy** vs. central serous chorioretinopathy vs. bilateral cataract	**Bilateral OCT** (GA per eye); **Amsler/home monitoring devices** (detect conversion); OCTA; low-vision rehab referral
Unilateral vision loss + drusen/GA, good fellow-eye vision	**Asymmetric AMD**; fellow-eye **progression risk high** → close monitoring essential vs. optic neuropathy vs. retinal detachment	**Bilateral OCT** (compare eyes); OCTA (CNV in affected eye); visual field; fellow-eye monitoring protocol

ABBREVIATIONS: AMD = age-related macular degeneration; GA = geographic atrophy; CNV = choroidal neovascularization; CRAO = central retinal artery occlusion; OCT = optical coherence tomography; FFA = fluorescein angiography; OCTA = OCT angiography; ERG = electroretinography; CRVO = central retinal vein occlusion; IOP = intraocular pressure; RPE = retinal pigment epithelium; RR = relative risk

CLINICAL PEARL: VISUAL HALLUCINATIONS → OFTEN CHARLES BONNET SYNDROME

Charles Bonnet syndrome (CBS) affects **~16%** of AMD patients overall and **~32%** of those in vision rehabilitation, yet patients **rarely volunteer symptoms for fear of being labeled psychiatrically ill**.[36] CBS is a **cortical-release phenomenon**: the brain "fills in" lost visual input with **vivid formed hallucinations** (faces, patterns, landscapes) while insight and cognition are fully preserved.[1,37] **Diagnosis requires**: recurrent visual hallucinations, preserved insight, vision loss, and **no other neuropsychiatric explanation**.[37] The primary intervention is **education** and **reassurance**; explaining that CBS is **common**, **benign**, and **not dementia or psychosis** produces significant **symptom relief**; antipsychotics should be avoided.[1] Self-management techniques (rapid blinking, lighting changes, eye movements) **may reduce episodes**.[1] Atypical features warranting **neuropsychiatric evaluation include**: lack of insight, multisensory hallucinations, or **associated neurological signs** (consider Lewy body dementia, Parkinson disease).[1] **For PCPs**: ask every AMD patient with moderate-to-severe vision loss **directly about visual hallucinations at each visit** and document CBS when present to **prevent inappropriate antipsychotic prescribing**.[37]

Comorbidity Screening

CONDITION	PREVALENCE/ ASSOCIATION*[1,2,38,39]	SCREENING APPROACH[1,40]
Type 2 diabetes mellitus	**OR 1.44** for AMD; shared vascular risk; **both require annual dilated exam**; T2DM + AMD compounds fall and depression risk	**HbA1c**; dilated exam **can identify both** AMD and diabetic retinopathy; coordinate endocrinology and ophthalmology
Hypertension (I10)	**OR 1.24** for AMD; untreated HTN **accelerates progression** and **CNV risk**; BP management is modifiable intervention	**Annual BP**; **target <130/80** per ACC/AHA; ensure antihypertensive adherence; counsel on AMD–cardiovascular link
Smoking (active or history)	**Largest modifiable AMD risk factor**; current smokers OR 2.3–2.8 for late AMD; update status at every visit	**Document pack-years**; offer **cessation counseling/ pharmacotherapy** (NRT, varenicline); quitline referral; reassess q3 months
Depression	**HR 1.15–1.28** in AMD population; **vision loss drives mood disorder** and reduces treatment adherence	**PHQ-9 at baseline and annually**; refer mental health if ≥10; address functional impact (driving loss, ADL decline)
Glaucoma (H40.xx)	**Can coexist with AMD**; anti-VEGF injections may **transiently elevate IOP**; conditions require separate monitoring	**Annual IOP + optic disc exam**; visual field if suspected; coordinate IOP monitoring post-injection with retinal specialist

ABBREVIATIONS: AMD = age-related macular degeneration; OR = odds ratio; T2DM = type 2 diabetes mellitus; HbA1c = hemoglobin A1c; HTN = hypertension; CNV = choroidal neovascularization; BP = blood pressure; ACC/AHA = American College of Cardiology/American Heart Association; NRT = nicotine replacement therapy; HR = hazard ratio; PHQ-9 = Patient Health Questionnaire–9; ADL = activities of daily living; IOP = intraocular pressure; VEGF = vascular endothelial growth factor

***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

⚠ RED FLAG — SAME-DAY RETINAL SPECIALIST CONTACT REQUIRED

These findings in a patient with known or suspected AMD require **immediate retinal specialist evaluation**:

- **Acute metamorphopsia (wavy/distorted lines on Amsler grid)**: Cardinal symptom of dry-to-wet AMD conversion with active CNV; earlier treatment initiation is associated with **better visual outcomes**; delays beyond 7 weeks are associated with 2.6-fold higher odds of **vision worsening**[1,33]
  - → Same-day phone/fax to retinal specialist; flag as "acute metamorphopsia, suspect wet AMD conversion, expedite”
- **Acute central scotoma (new dark/blank spot in central vision)**: May indicate **new CNV activity** (wet AMD) or acute expansion of GA; acute onset in a patient with intermediate or wet AMD is presumed neovascular until proven otherwise[1,33]
  - → Same-day retinal specialist contact; urgent OCT to differentiate CNV from GA
- **Sudden vision loss ≥3 lines on Snellen/ETDRS chart**: Suggests active hemorrhage, large CNV, or retinal pigment epithelial detachment; irreversible photoreceptor damage begins within hours to days[9,19]
  - → Same-day retinal specialist contact; do not wait for next scheduled appointment
- **Acute subretinal or intraretinal hemorrhage on dilated exam**: Approximately 12% of AMD patients experience subretinal hemorrhage; blood is **directly toxic to photoreceptors** via iron release and fibrin contraction[41]
  - → Same-day retinal specialist contact; surgical displacement or anti-VEGF may be required urgently

⚠ RED FLAG — URGENT EVALUATION (WITHIN 48-72 HOURS)

These urgent conditions require expedited evaluation and intervention:

- **New or worsening floaters + scotoma in AMD patient**: May indicate vitreous hemorrhage from CNV or posterior vitreous detachment with retinal tear; 5%–14% of patients with acute PVD symptoms have a retinal tear at initial examination[1,42]
  - → Urgent ophthalmology evaluation within 24–48 hours; counsel patient to seek immediate care if visual field loss progresses
- **Recurrent vision loss in treated wet AMD (previously stable)**: Suggests **treatment resistance** (persistent intraretinal/subretinal fluid despite anti-VEGF), CNV recurrence, or fellow-eye conversion; persistent disease activity occurs in a substantial proportion of treated eyes[43]
  - → Urgent retinal specialist contact within 48–72 hours; OCT to assess fluid status; may require agent switch, dosing interval change, or combination therapy
- **New symptoms in fellow eye of patient with unilateral wet AMD**: Fellow-eye conversion risk is **elevated** (RR 2.34 within 36 months); any new metamorphopsia, scotoma, or VA decline in the previously unaffected eye is **presumed neovascular until excluded**[35]
  - → Urgent retinal specialist evaluation within 48 hours; bilateral OCT; reinforce daily Amsler grid monitoring

3 MEAT DOCUMENTATION ESSENTIALS

AMD documentation requires **specifying type** (dry vs. wet), **laterality**, **stage/activity status**, **imaging findings** with quantification, **current treatment**, and **functional impact**, ultimately enabling **timely specialist referral**.[1,9] The most common gaps are defaulting to **H35.30** (unspecified) instead of the specific subtype, failing to record imaging confirmation and staging that justify the diagnosis, and omitting functional status and modifiable risk factors. **Each gap obscures the clinical picture** and **impedes coordination with retinal specialists**.

Case vignette*: A 76-year-old female, Medicare Advantage member, presents for annual vision assessment.* ***Ophthalmology dilated fundus exam****: bilateral AMD, right eye advanced dry with subfoveal GA (area 3.5 mm^2), left eye intermediate dry with large drusen. OCT confirms structural findings. VA OD 20/80, OS 20/60. On AREDS2 daily × 6 months, good adherence.* ***No metamorphopsia on Amsler grid****.* ***Past medical history****: hypertension, former smoker (quit 12 years ago), no diabetes.*

MONITOR: "Bilateral AMD. OD: **H35.3114** (advanced dry, subfoveal GA, 3.5 mm^2). **OS**: **H35.3121** (intermediate dry, large drusen). VA OD 20/80, OS 20/60. OCT [date]: GA area OD 3.5 mm^2, no intraretinal fluid either eye. Amsler grid stable, no metamorphopsia. Daily home monitoring instructed. Next retinal specialist [date]. Next PCP annual review 12 months."

EVALUATE: "**Type**: bilateral dry AMD, no wet conversion. **Stage**: OD advanced with subfoveal GA; OS intermediate. **VA trend**: OD stable from prior (20/80 → 20/80); OS stable (20/60 → 20/60). **Functional vision**: reads with magnification, drives daytime only. Modifiable risk factors: former smoker (**Z87.891**, quit 12 yrs); BP 128/76 (I10, at goal); no diabetes. PHQ-9: 7 (subthreshold). **Falls risk**: negative."

ASSESS: "OD GA progressing (3.5 mm^2, up from 2.8 mm^2 12 months ago → ~0.7 mm^2/yr expansion). **Complement inhibitor candidate** → retinal specialist assessment within 6 weeks. OS intermediate, stable → **continue AREDS2** and monitor for conversion. No wet AMD conversion either eye. Depression subthreshold, no intervention needed. **Driving**: daytime only, adequate for now; reassess if VA declines. Fall risk low."

TREAT: "**AREDS2** (lutein 10 mg, zeaxanthin 2 mg, vitamin C 500 mg, E 400 IU, zinc 80 mg, copper 2 mg) → adherence confirmed, continue. **Smoking**: former, no relapse risk. BP at goal on lisinopril 10 mg. Retinal specialist referral for complement inhibitor eligibility (OD, pegcetacoplan or avacincaptad). **Low-vision rehab referral** for magnification aids. PT/OT for home safety assessment. PHQ-9 recheck 12 months. Amsler grid daily → **call same day if wavy lines**. F/u PCP 12 months; retinal specialist 6 weeks."

Clinical Documentation Elements

- **Type and laterality:** Document whether **dry** (**H35.31**) or **wet** (**H35.32**) AMD; specify **which eye(s)** affected (right, left, bilateral, unspecified); **clearly state in note**: 'Wet AMD, bilateral' or 'Dry AMD with geographic atrophy, right eye.'[1,2]
- **Imaging findings and quantification: OCT**: macular thickness (normal ~275 µm), presence/absence of fluid (intraretinal vs. subretinal), GA area if applicable (mm^2), drusen burden (small/medium/large); **OCTA or FFA**: CNV type if wet (type 1, 2, PCV); **fundus**: drusen size/character, retinal atrophy[1,44] pattern, bleeding/exudates if wet; **document baseline imaging area** for **tracking progression**
- **Stage or activity status: If dry AMD**: AREDS stage (early/intermediate/advanced, with or without subfoveal GA); **if wet AMD**: CNV activity status (active with fluid/hemorrhage vs. inactive with scar) → documented at **each visit**; critical for **treatment decision** (anti-VEGF frequency) and documentation[1,9]
- **Treatment status and response: AREDS2**: initiated yes/no; patient adherence (daily intake reported); **anti-VEGF**: agent (aflibercept/ranibizumab/biosimilar/bevacizumab), frequency, injection count, VA response (stable/improving/declining), last injection date; **complement inhibitor** (if GA): agent, frequency, GA expansion rate if baseline imaging available[1,9]
- **Functional impact and VBC measures:** Visual acuity **per eye** (both required, trend if multiple visits), ability to read (with/without aids), driving status (safe/unsafe/ceased), activities of daily living (dressing, grooming, meal prep maintained vs. declining), depression screening (PHQ-9 score), fall history (any incidents?)[1,45]

Reframing Common Documentation Shortcuts

INSTEAD OF…	DOCUMENT…[1,2]
'Macular degeneration'	'Nonexudative AMD, left eye, intermediate stage' **OR** 'Exudative AMD, bilateral, active CNV' → supports **H35.31/H35.32 coding** and **stage/activity tracking**
'Vision loss due to age'	'Vision loss **secondary to advanced dry AMD with GA**, left eye, subfoveal; VA 20/100; Amsler stable; home monitoring active' → demonstrates **MEAT framework**
'Patient declined AREDS2' without discussion	'Intermediate dry AMD; counseled on AREDS2 formula and **25% 5-year progression reduction**; patient declines; **will revisit next visit**' → documents **shared decision-making**
'Referred to eye doctor' without detail	'Referred to **retinal specialist** for **exudative AMD with active CNV**; urgent (within 2 weeks); **transportation arranged**; patient educated on conversion symptoms and same-day contact trigger; **f/u 3 weeks to confirm seen**' → demonstrates **closed-loop care coordination**
'Smoking: denies current use'	'Former smoker, **40 pack-years**, quit 2 years ago; **counseled on AMD progression risk and protective effect of continued cessation**; no relapse; encouraged abstinence' → **quantifies exposure**; documents risk factor management

ABBREVIATIONS: AMD = age-related macular degeneration; CNV = choroidal neovascularization; GA = geographic atrophy; VA = visual acuity; AREDS2 = Age-Related Eye Disease Study 2; MEAT = monitor/evaluate/assess/treat; f/u = follow-up

4 TREATMENT AND REFERRAL QUICK GUIDE

AMD treatment is managed by retinal specialists, but the **PCP's highest-value contributions** center on **three time-sensitive actions**: ensuring **same-day specialist contact** when wet AMD conversion is suspected, **initiating AREDS2 supplementation** at intermediate stage, and **sustaining treatment adherence** by addressing transportation, depression, and caregiver burden.[1,9] All FDA-approved **anti-VEGF agents** (aflibercept, ranibizumab, brolucizumab, faricimab) and **off-label bevacizumab** have **comparable efficacy for neovascular AMD**; bevacizumab is **substantially less expensive** (~$50/dose vs. $776–$1,950/dose for branded agents) and represents a **high-value option**.[1,9,46] Multiple aflibercept biosimilars and ranibizumab biosimilars are now FDA-approved, with projected Medicare savings of **~$132 million annually** if adopted over **branded equivalents**.[1] Treatment regimens include monthly loading doses (3 injections at 4-week intervals) followed by individualized maintenance; **treat-and-extend** is a widely adopted approach, **reducing injection burden** while **maintaining visual outcomes**.[1,20,47]

Therapy Escalation Criteria

TRIGGER*[1,3,9]	ACTION*[1,13,47,48]
Acute metamorphopsia or new scotoma in intermediate/advanced AMD patient	**Same-day retinal specialist contact**; document symptom onset time and laterality; anti-VEGF must start within 14 days
Exudative features (hemorrhage, fluid) on dilated exam; wet AMD not yet diagnosed	**Urgent retinal specialist referral** (within 48 hours); OCT/FFA at specialist; rule out retinal detachment or CRAO
GA with subfoveal involvement newly documented or expanding	Retinal specialist **within 1–2 weeks**; assess complement inhibitor eligibility (pegcetacoplan, avacincaptad); **low-vision rehab referral**
Bilateral advanced AMD (GA or wet); ADL or driving impairment	**Multidisciplinary coordination**: retinal specialist, low-vision rehab, PT/OT, social work, mental health
Anti-VEGF nonadherence (missed injections); transportation or psychosocial barriers	**Identify barriers** (transport, cost, anxiety); arrange **medical transport**; discuss **treat-and-extend** with specialist to reduce visit burden

ABBREVIATIONS: AMD = age-related macular degeneration; ADL = activities of daily living; OCT = optical coherence tomography; FFA = fluorescein angiography; CRAO = central retinal artery occlusion; GA = geographic atrophy; PT/OT = physical/occupational therapy; VEGF = vascular endothelial growth factor; FDA = U.S. Food and Drug Administration
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

CLINICAL PEARL: BEVACIZUMAB, A HIGH VALUE ANTI-VEGF OPTION FOR WET AMD

Bevacizumab (Avastin) is used off-label as a **compounded intravitreal injection** and is the **most widely used anti-VEGF agent** for neovascular AMD worldwide.[1] The **CATT trial** (1,208 patients, NIH-funded) demonstrated **equivalence to ranibizumab**, with **8.0** vs. **8.5 letters** gained at 1 year; the **IVAN** trial confirmed these findings, and a Cochrane review of 9 RCTs found **no difference in effectiveness or safety** with high-certainty evidence.[18,49,50] A 2018 meta-analysis of **>8,000 eyes** extended this equivalence to **aflibercept**.[1] The **cost difference is substantial**: wholesale prices range from **~$50/dose** (bevacizumab) to **$776** (ranibizumab 0.3 mg) and **$1,806** (aflibercept 2 mg) per Medicare ASP data, with cost-utility estimated at **~$2,700/QALY** for bevacizumab versus **$63,300/QALY** for ranibizumab monthly.[1] **CMS covers bevacizumab for ophthalmic use despite its off-label status**.[18] **Key caveat**: bevacizumab requires compounding, introducing a contamination risk mitigated by USP 797–compliant pharmacies.[1] **For PCPs**, bevacizumab should be discussed as a **first-line option for cost-sensitive Medicare patients**, and the choice of a more expensive branded agent should be a **shared decision**, **not a default**.

AAO PPP 2025–Aligned Treatment Recommendations

PROFILE	GUIDELINE-ALIGNED APPROACH*[1,3,9]	NOTES*[1–3,13]
Smoking cessation (all AMD stages)	**Counseling + pharmacotherapy** (varenicline, NRT, or bupropion); quitline 1-800-QUIT-NOW	**Largest modifiable risk factor** (OR 2.3–2.8 for late AMD); risk approaches never-smoker after >20 years of cessation; **document status** at every visit
AREDS2 supplementation (intermediate dry AMD)	Lutein 10 mg, zeaxanthin 2 mg, vitamin C 500 mg, vitamin E 400 IU, zinc 80 mg, copper 2 mg daily; OTC ~$15–30/month	**25% reduction in 5-year progression** to advanced AMD; **NOT original AREDS** with beta-carotene (lung cancer risk in smokers); initiate at **intermediate stage**
Anti-VEGF therapy (wet AMD)	Aflibercept, ranibizumab, faricimab, brolucizumab (all FDA-approved); **bevacizumab** (**off-label**, ~$50/dose); biosimilars (Pavblu, Byooviz, Cimerli, others) at ~25–35% savings	**Specialist-administered**; treat within 14 days of wet AMD onset; **treat-and-extend preferred** to reduce visit burden; all agents show **comparable visual outcomes**
Complement inhibitors (GA, advanced dry AMD)	Pegcetacoplan (Syfovre) or avacincaptad pegol (Izervay); **intravitreal**, monthly or EOM	**Slows GA progression ~15–21%** at 12 months; does **NOT** reverse atrophy; MNV risk increased (monitor for new metamorphopsia between visits); **high treatment burden**
BP control (hypertension + AMD)	**Target <130/80 mmHg** per ACC/AHA; any first-line class (ACE-I, ARB, thiazide, CCB)	**Hypertension is modifiable AMD risk factor** (OR 1.24); reinforce BP–AMD progression link; **avoid excessive lowering in frail patients**

ABBREVIATIONS: NRT = nicotine replacement therapy; OR = odds ratio; AMD = age-related macular degeneration; AREDS2 = Age-Related Eye Disease Study 2; OTC = over-the-counter; VEGF = vascular endothelial growth factor; FDA = U.S. Food and Drug Administration; EOM = every other month; GA = geographic atrophy; MNV = macular neovascularization; BP = blood pressure; ACC/AHA = American College of Cardiology/American Heart Association; ACE-I = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; CCB = calcium channel blocker
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Non-Pharmacologic Treatment and Lifestyle Modification

INTERVENTION	TARGET/RECOMMENDATION[1,13,15,51]	NOTES[12,34,36]
Home monitoring (Amsler grid or electronic device)	**Daily Amsler grid**; report metamorphopsia or scotoma **within hours**; electronic monitoring) if available: higher sensitivity for wet conversion	**Low-cost, high-specificity**; electronic monitoring **improves time-to-treatment**; patient education on what constitutes a positive result

INTERVENTION	TARGET/RECOMMENDATION[1,13,15,51]	NOTES[12,34,36]
Low-vision rehabilitation	**Magnification aids**; lighting optimization; large-print/text-to-speech; home safety assessment; driving evaluation; state vocational rehab programs	Proactive referral at **intermediate/ advanced stage**; reduces depression and fall risk; VBC outcome measure
Fall prevention (PT/OT)	**Fall risk assessment**; strength/balance training; **home modification** (lighting, grab bars, tripping hazards); gait aid; footwear review	**AMD is independent fall risk factor** (~2× ADL impairment); early referral for robust patients; **urgent for frail/prior fall**
Mental health screening	**PHQ-9 at baseline and annually**; refer behavioral health if **≥10**; SSRI or appropriate antidepressant; peer support (AMD Alliance)	**HR 1.15–1.23** for depression in AMD; explain **vision loss–mood link** explicitly; screen for **Charles Bonnet syndrome**
Transportation and care coordination	Arrange **medical transport** or **caregiver support** for specialist visits; **problem-solve**: distance, cost, frailty barriers; engage social work	Most common reason for **missed anti-VEGF injections**; treat-and-extend **reduces visit burden**; caregiver engagement reduces no-shows

ABBREVIATIONS: AMD = age-related macular degeneration; PT/OT = physical/occupational therapy; ADL = activities of daily living; PHQ-9 = Patient Health Questionnaire–9; SSRI = selective serotonin reuptake inhibitor; HR = hazard ratio; VEGF = vascular endothelial growth factor; VBC = value-based care

Medication Safety and Dose Adjustments

AGENT	KEY CONSIDERATIONS*[2,52–54]	PCP ACTION*[1,9,55]
Anti-VEGF agents (intravitreal) + anticoagulation	**No increased risk of**: MI, CVD, or major bleeding across bevacizumab, ranibizumab, and aflibercept in 87,844-patient cohort study; **theoretical ATE risk remains**; patients with **CAD** or **recent MI/stroke** within 6 months carry higher risk (aHR 3.47 for CAD)	**Continue anticoagulation as indicated**; no dose adjustment; flag recent MI/stroke history to retinal specialist; monitor for bleeding signs
AREDS2 zinc (80 mg) + copper	**High-dose zinc inhibits copper absorption** → copper (2 mg) included in AREDS2 formula to **prevent deficiency anemia**; zinc arms in AREDS showed more self-reported anemia (13.2% vs. 10.2%) but **no hematocrit difference**	**Do not** add supplemental copper **unless deficiency documented**; separate zinc from iron, fluoroquinolones, tetracyclines by **≥2 hours**; take with food

AGENT	KEY CONSIDERATIONS*[2,52–54]	PCP ACTION*[1,9,55]
AREDS2 + smoking	**Beta-carotene** (original AREDS) **increased lung cancer in smokers** → AREDS2 replaced with lutein/zeaxanthin, **safe in current/former smokers**; smoking itself remains the largest modifiable AMD risk factor	**Confirm AREDS2 formula** (NOT original AREDS with beta-carotene) in any current/former smoker; **cessation counseling** at every visit
Complement inhibitors (pegcetacoplan, avacincaptad) + MNV risk	**Pegcetacoplan**: new exudative AMD in 11% (monthly) vs. 2% (sham) at 24 months; **avacincaptad**: MNV RR 3.13 but **better overall safety profile**; endophthalmitis risk ~6–8 per 1,000 with pegcetacoplan	**Specialist-directed**; **PCP role**: monitor for **new metamorphopsia** between GA injection visits (may signal treatment-related MNV); ensure **Amsler grid compliance**
Anti-VEGF + glaucoma (elevated IOP)	**Transient IOP elevation** post-injection in 6–12% of patients; sustained elevation requiring treatment in 3.5–11.6%; most managed with **topical IOP-lowering agents**	**Ensure glaucoma medications continued**; flag pre-existing glaucoma to retinal specialist; educate patient on **acute angle-closure symptoms** (eye pain, halos)
Intravitreal bevacizumab (compounded)	**Off-label for AMD**; compounding pharmacy variation in preservatives/additives; endophthalmitis rate ~0.06% per injection; **no difference in systemic safety vs. branded agents**	**Obtain allergy history** (preservatives, antibiotics); communicate to specialist and compounding pharmacy; consider branded alternative **if allergy concern**

ABBREVIATIONS: VEGF = vascular endothelial growth factor; MI = myocardial infarction; CVD = cardiovascular disease; ATE = arterial thromboembolic event; CAD = coronary artery disease; aHR = adjusted hazard ratio; PCP = primary care physician; AREDS2 = Age-Related Eye Disease Study 2; AREDS = Age-Related Eye Disease Study; AMD = age-related macular degeneration; MNV = macular neovascularization; RR = relative risk; IOP = intraocular pressure; GA = geographic atrophy
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

When to Refer

CRITERION	SPECIALIST[1,9]	URGENCY[1,3,21,34]
Acute metamorphopsia, new scotoma, or sudden VA loss in AMD patient	Retinal specialist	**Same-day**; call specialist directly; anti-VEGF must start within 14 days
New wet AMD diagnosis (exudative findings on exam or imaging)	Retinal specialist	**Within 1–2 weeks**; treatment delay >7 weeks reduces improvement from 38% to 20%

CRITERION	SPECIALIST[1,9]	URGENCY[1,3,21,34]
GA newly documented or expanding on imaging	Retinal specialist	**Within 2–4 weeks**; assess complement inhibitor eligibility (pegcetacoplan, avacincaptad)
Intermediate dry AMD (large drusen or pigmentary changes)	Ophthalmology/ retinal specialist	**Within 3–6 months**; confirm AREDS2 initiated; establish monitoring baseline
Low vision or functional impairment (reading, driving, ADL loss)	Low-vision specialist; OT/PT	**Within 1–3 months**; proactive referral — **do not wait** for patient to fail
Depression, anxiety, or Charles Bonnet syndrome (PHQ-9 ≥10)	Mental health; peer support	**Within 2–4 weeks**; concurrent with AMD management
Fall risk or fall history in AMD patient	PT/OT; geriatrics if frail	**Within 1 month**; home hazard assessment; driving safety review

ABBREVIATIONS: AMD = age-related macular degeneration; VA = visual acuity; VEGF = vascular endothelial growth factor; GA = geographic atrophy; AREDS2 = Age-Related Eye Disease Study 2; ADL = activities of daily living; OT = occupational therapy; PT = physical therapy; PHQ-9 = Patient Health Questionnaire–9; VBC = value-based care

Follow-Up Timing

STAGE	FREQUENCY[1,9]	MONITORING*[1,2]
Early dry AMD (stable)	Every **1–2 years**	**Dilated exam**; **VA**; **Amsler grid**; smoking/CV risk; depression/fall screen annually
Intermediate dry AMD (on AREDS2)	Every **6–12 months**	**Dilated exam**; **OCT** per specialist; VA trend; AREDS2 adherence; smoking cessation; HTN/DM control
Advanced dry AMD (GA)	Every **3–6 months** (retinal specialist)	**OCT** → quantify GA area and expansion rate; **OCTA** to rule out wet conversion; **complement inhibitor eligibility**; vision rehab; driving safety
Wet AMD (active CNV, on anti-VEGF)	Every **4–8 weeks** (retinal specialist)	**OCT** → **fluid resolution**; VA; anti-VEGF per protocol (monthly or treat-and-extend); injection burden; IOP post-injection; transport/adherence barriers
Wet AMD (inactive CNV, observation)	Every **8–12 weeks** (retinal specialist)	**OCT** → **recurrence surveillance**; VA; extended-interval anti-VEGF if applicable; transition to scar; comorbidity management

STAGE	FREQUENCY[1,9]	MONITORING*[1,2]
VBC care coordination (PCP)	**Annually** or per care plan	**AMD status via specialist summary**; HTN/DM/smoking; PHQ-9; fall risk; low-vision rehab progress; AREDS2 or anti-VEGF adherence; medication reconciliation; caregiver/transport support

ABBREVIATIONS: AMD = age-related macular degeneration; VA = visual acuity; CV = cardiovascular; AREDS2 = Age-Related Eye Disease Study 2; OCT = optical coherence tomography; HTN = hypertension; DM = diabetes mellitus; GA = geographic atrophy; OCTA = optical coherence tomography angiography; CNV = choroidal neovascularization; VEGF = vascular endothelial growth factor; IOP = intraocular pressure; PCP = primary care physician; PHQ-9 = Patient Health Questionnaire–9; VBC = value-based care
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Comorbidity Management

COMORBIDITY	PCP APPROACH*[1,9,34]	COORDINATION*[2,21,53]
Type 2 diabetes (E11.x)	**HbA1c q3–6 months**; BP/lipid optimization; **annual dilated exam** captures both diabetic retinopathy and AMD	**Endocrinology** for glycemic targets; **ophthalmology** differentiates diabetic macular edema from AMD on imaging
Hypertension (I10)	**Target <130/80 mmHg**; any first-line class acceptable (ACE-I, ARB, thiazide, CCB); reinforce **BP–AMD progression link**	**Cardiology if resistant HTN**; **avoid** excessive lowering in frail patients
Glaucoma (H40.x)	**Annual IOP and optic disc exam**; **ensure adherence** to topical IOP-lowering agents; anti-VEGF injections may transiently raise IOP	**Ophthalmology monitors IOP post-injection** in glaucoma patients; separate monitoring from AMD
Depression	**Baseline PHQ-9**; annual reassessment; refer behavioral health if **≥10**; discuss **vision loss–mood link** explicitly; educate about **Charles Bonnet syndrome**	**Mental health** for therapy/medication; peer support (AMD Alliance, Macular Disease Foundation)
Fall risk	**Screen annually** (TUG or equivalent); **home hazard assessment**; medication review for sedating agents; assess driving safety each visit	**PT/OT for balance/gait training**; low-vision rehab for environmental adaptation
Smoking (current or former)	Document **status** and **pack-years at every visit**; offer varenicline/NRT/bupropion; quitline 1-800-QUIT-NOW; reinforce **continued abstinence** in former smokers	**Tobacco cessation program**; relapse prevention even in former smokers (40% relapse within 1 year if unsupported)

COMORBIDITY	PCP APPROACH*[1,9,34]	COORDINATION*[2,21,53]

ABBREVIATIONS: ACE-I = angiotensin-converting enzyme inhibitor; AMD = age-related macular degeneration; ARB = angiotensin receptor blocker; BP = blood pressure; CCB = calcium channel blocker; HTN = hypertension; IOP = intraocular pressure; VEGF = vascular endothelial growth factor; PHQ-9 = Patient Health Questionnaire–9; TUG = Timed Up and Go; PT/OT = physical/occupational therapy; NRT = nicotine replacement therapy; FDA = US Food and Drug Administration
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Cost-Smart Options

Anti-VEGF therapy is the **single largest cost driver in AMD care**, with wholesale prices ranging from ~$50 per dose (compounded bevacizumab) to **~$1,806 per dose** (aflibercept 2 mg) as of October 2022 Medicare ASP data.[1,56] Bevacizumab is substantially less expensive than FDA-approved agents yet demonstrates **equivalent efficacy in treating neovascular AMD** (**CATT trial**), with a cost-utility of **~$2,700/QALY** versus **$63,300/QALY** for ranibizumab.[1,49,50,56] Five **aflibercept biosimilars** (Yesafili, Opuviz, Ahzantive, Enzeevu, Pavblu) and two **ranibizumab biosimilars** (Cimerli, Byooviz) are now FDA-approved, with high-to-moderate certainty evidence showing little to no difference in effectiveness or safety versus reference products.[1,57] However, a bevacizumab biosimilar could **paradoxically increase Medicare costs** by **$457–$897 million annually if compounded off-label bevacizumab is displaced**.[58] For complement inhibitors, 2-year treatment costs range from **~$40,600** (avacincaptad EOM) to **~$67,400** (avacincaptad EM), with pegcetacoplan showing better cost-effectiveness per mm^2 of GA preserved in extrafoveal lesions.[1,59] **Treat-and-extend dosing reduces injection burden** (faricimab: median 10 injections over 2 years vs. 15 for aflibercept Q8W) and is the **primary VBC strategy for reducing visit frequency** without compromising outcomes.[60]

BRAND (EST. COST)[1,58,59,61]	GENERIC/ ALTERNATIVE (EST. COST)*[1,57,62,63]	EST. SAVINGS	COST-SMART TIP[1,56,59,60,64]
Aflibercept 2 mg (Eylea) ~$1,806/dose; ~$14,400– 21,700/yr (Q8W–monthly)	Aflibercept **biosimilar** (Pavblu, Opuviz, Ahzantive) **~$1,200–1,400/dose**; compounded bevacizumab **~$50–100/dose**	**~$400–1,700/dose** (biosimilar); **~$1,700/dose** (bevacizumab)	**Biosimilars**: equivalent efficacy (Cochrane 2024); bevacizumab: equivalent VA outcomes (CATT); $2,700/QALY vs. $63,300/QALY for ranibizumab; treat-and-extend reduces injections ~30–40%
Ranibizumab 0.5 mg (Lucentis) ~$1,292/dose; ~$15,500/yr (monthly)	Ranibizumab biosimilar (Cimerli, Byooviz) **~$1,130–1,360/dose**; compounded bevacizumab ~$50–100/dose	**~$130–160/dose** (biosimilar); ~$1,200/dose (bevacizumab)	Biosimilar savings modest (**~10%**); bevacizumab remains lowest-cost option; **Medicare Part B** ASP-based reimbursement **favors higher-cost agents** (6% add-on)

BRAND (EST. COST)[1,58,59,61]	GENERIC/ ALTERNATIVE (EST. COST)*[1,57,62,63]	EST. SAVINGS	COST-SMART TIP[1,56,59,60,64]
Faricimab (Vabysmo) ~$1,800–2,000/dose; ~$10,000–16,000/yr (Q12W–Q16W dosing achievable in ~60–80%)	Compounded bevacizumab **~$50–100/dose**; aflibercept biosimilar ~$1,200–1,400/dose	**Variable**; fewer injections offset higher per-dose cost	Extended dosing (up to Q16W) **reduces visit burden**; median 10 injections over 2 years vs. 15 for aflibercept Q8W; dual Ang-2/VEGF mechanism; **no biosimilar** yet available
Pegcetacoplan (Syfovre) ~$2,200–2,800/dose; ~$26,400–67,200/yr (monthly–EOM, per eye)	No alternative; only 2 FDA-approved GA therapies	N/A	**EOM dosing preferred**: 18% GA reduction (similar to monthly 22%) at ~50% lower cost ($49,200/mm^2 vs. $87,300/mm^2); extrafoveal GA has greater cost-utility; no functional benefit demonstrated at 1 year
Avacincaptad pegol (Izervay) ~$2,000–2,500/dose; ~$24,000–60,000/yr (monthly–EOM, per eye)	Pegcetacoplan (Syfovre) — similar class, different target	Variable	EOM dosing **more cost-effective** ($57,100/mm^2 EM vs. lower EOM); pegcetacoplan may be **more cost-effective per mm^2** for **extrafoveal GA**; discuss realistic expectations (slows but does not reverse GA)
AREDS2 branded (PreserVision) ~$25–35/month (~$300–420/yr)	Generic AREDS2 formula **~$15–20/month** (~$180–240/yr)	**~$60–180/yr**	**Highest-value intervention in AMD**: 25% progression reduction over 5 years for **~$200/yr**; OTC, no prescription needed; negligible cost vs. downstream anti-VEGF or GA therapy; confirm no beta-carotene in smokers
Smoking cessation (varenicline) ~$275/month (~$1,650/6-month course)	**Generic** varenicline **~$50–100/month**; NRT patch/gum **~$30–80/month** OTC; bupropion **~$20–50/month** generic	**~$175–225/month** (generic varenicline)	Single highest-value modifiable intervention; cost-per-quit ~$9,823 (varenicline) vs. ~$19,510 pooled; ACA mandate covers pharmacotherapy; quitline 1-800-QUIT-NOW (free); prevents years of AMD-related disability

BRAND (EST. COST)[1,58,59,61]	GENERIC/ ALTERNATIVE (EST. COST)*[1,57,62,63]	EST. SAVINGS	COST-SMART TIP[1,56,59,60,64]
Low-vision rehabilitation (OT evaluation ~$200–500; magnifiers $50–500; home modification $500–5,000+)	**State vocational rehab programs** (**often free**); VA blind rehab services; Medicare Part B covers OT	**Variable**; state programs may cover full cost	**Medicare reimburses OT for vision rehab**; proactive referral at **intermediate/advanced stage** prevents secondary decline (falls, depression, ADL loss); high ROI vs. downstream ED/hospitalization costs

ABBREVIATIONS: Q8W = every 8 weeks; QALY = quality-adjusted life year; VA = Veterans Affairs; CATT = Comparison of Age-related Macular Degeneration Treatments Trials; ASP = average sales price; Q12W = every 12 weeks; Q16W = every 16 weeks; Ang-2 = angiopoietin-2; VEGF = vascular endothelial growth factor; EOM = every other month; FDA = U.S. Food and Drug Administration; GA = geographic atrophy; AMD = age-related macular degeneration; AREDS2 = Age-Related Eye Disease Study 2; OTC = over-the-counter; NRT = nicotine replacement therapy; ACA = Affordable Care Act; OT = occupational therapy; ADL = activities of daily living; ED = emergency department; WAC = wholesale acquisition cost

Estimated costs reflect approximate 2024–2025 US wholesale acquisition cost (WAC) or out-of-pocket ranges and do not account for insurance coverage, copay assistance, or negotiated rates

***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Patient Education and Adherence

AMD is **painless and often asymptomatic** until advanced stages, making **patient education critical** → treatment adherence (daily AREDS2 or serial anti-VEGF injections) directly **determines whether vision is preserved or permanently lost**.[1,9] Up to **50%** of patients discontinue anti-VEGF therapy by **24 months**, driven by transportation, cost, injection anxiety, and comorbidities.[13,14] **Education should emphasize**: the diagnosis in plain language, why appointments and supplements must not be missed, warning signs requiring same-day specialist contact, smoking cessation, fall prevention, and cost-support resources.

DOCUMENTATION REMINDER: PATIENT EDUCATION

Document the following education topics, the patient and caregiver(s) present, materials provided, and patient understanding (**teach-back method**):

- **Diagnosis in plain language**: AMD is progressive central retinal disease; dry (90%) **progresses slowly through drusen**; wet (10%) causes **rapid vision loss** through leaking vessels; document patient understands their type and stage[2,9]
- **AREDS2 adherence (intermediate AMD)**: Daily supplementation reduces 5-year progression by **~25%**; no beta-carotene in current/former smokers; OTC ~$20–30/month; benefit requires **consistent daily intake**[13,14]
- **Anti-VEGF adherence (wet AMD)**: ~7–8 injections year one; **50% discontinue** by 24 months → disease reactivation and irreversible loss; **treat-and-extend reduces burden**; discuss barriers **proactively**[1,9]
- **Warning symptoms → same-day specialist contact**: Metamorphopsia (wavy lines); new scotoma; sudden loss ≥3 lines → **do not wait for next scheduled appointment**[1,2]
- **Smoking cessation**: Largest modifiable risk factor (OR 1.8–3.0 for late AMD); offer varenicline/NRT; quitline 1-800-QUIT-NOW; document pack-years[1,2]
- **Fall prevention**: AMD independently increases fall risk (~2x ADL impairment); **reduce home hazards**; PT/OT referral; assess driving safety each visit[20,21]
- **Psychological well-being**: PHQ-9 at baseline and annually; AMD associated with HR 1.15–1.23 for depression; refer behavioral health if ≥10; educate about **Charles Bonnet syndrome** (visual hallucinations ≠ psychosis)[1,34]
- **Cost-support resources**: Anti-VEGF covered under **Medicare Part B** (20% coinsurance); Medicare Part D $2,000/year OOP cap (IRA 2025)[1,56]
- **Caregiver assessment**: >50% of AMD caregivers report burden; document **caregiver understanding** of warning symptoms, injection schedule, transportation plan; screen for caregiver fatigue; connect to support resources (AMD Alliance, Macular Disease Foundation)[1,65]

Quality Metrics Tie-In

No AMD- or vision-specific HEDIS or MIPS measures are currently active in MY2026. The only ophthalmology-relevant MIPS measure, **Dilated Macular Examination** (MIPS #14), was retired after MY2023. **However, AMD in older adults intersects with** chronic disease management, polypharmacy, depression, fall risk, and functional decline, meaning that **several cross-cutting HEDIS measures apply across the AMD care trajectory** and can anchor **quality reporting for any PCP** managing these patients.[1,20,34,65]

MEASURE	STANDARD	AMD APPLICABILITY*[1,20,34,48,65]
HEDIS COA: Care for Older Adults- Medication Review	**Denominator**: MA enrollees ≥66, continuously enrolled; **Numerator**: sub-measures documented annually: (**1**) functional status assessment, (**2**) medication review, **Exclusions**: hospice, ESRD	AMD patients are on **AREDS2 supplements** (zinc-copper interaction), may be on anti-VEGF therapy with cardiovascular risk; **documented review should reconcile**: AREDS2 zinc against copper/iron/calcium, flag Beers-listed agents, and confirm AREDS2 adherence as a modifiable intervention reducing progression by ~25%
HEDIS COA: Care for Older Adults- Functional Status Assessment	**Denominator**: enrollees ≥66; **Numerator**: functional status assessment documented annually **Exclusions**: hospice, ESRD	Vision loss from AMD is independently **associated with falls** (HR 1.25), **functional decline in ADLs** (~2x risk), and **driving loss** (~70% in bilateral GA); gait assessment, ADL/ IADL screening, and vision-specific functional questions **directly satisfy this sub-measure** and identify patients needing PT/OT/low-vision rehab referral
HEDIS TRC: Transitions of Care Patient	**Denominator:** enrollees ≥18 with inpatient discharge; **Numerator:** sub-measures within 30 days: (**1**) notification of inpatient admission, (**2**) receipt of discharge information, **Exclusions:** hospice	AMD patients with comorbid frailty have **frequent hospitalizations** (falls, cardiovascular events); post-discharge medication reconciliation is critical given **AREDS2 supplement interactions** and **anti-VEGF injection scheduling**; timely PCP follow-up ensures specialist appointments are **not missed** during recovery
HEDIS DMS-E: Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults	**Denominator:** enrollees ≥12 with diagnosis of major depression or dysthymia AND elevated PHQ-9 ≥10 **Numerator:** follow-up PHQ-9 documented within 4–8 months of index elevated score **Exclusions:** hospice	**Depression** HR 1.15 (95% CI 1.13–1.17) in AMD, rising to **1.23 with visual disability**; vision loss drives reading loss, driving loss, social withdrawal, and mood disorder; PHQ-9 monitoring supports both quality reporting and clinical management of a **high-prevalence AMD comorbidity**
HEDIS ACP: Advance Care Planning	**Denominator:** enrollees ≥66; **Numerator:** advance care plan or surrogate decision-maker documented, **OR** documentation that ACP was discussed but patient declined **Exclusions:** hospice	Advanced GA and end-stage wet AMD (bilateral scarring) carry **significant functional decline**; ACP should begin when vision loss threatens independence, not at end-of-life; patients facing bilateral legal blindness have **unique goals-of-care considerations**; billable as CPT 99497/99498 during AWV with no copay

MEASURE	STANDARD	AMD APPLICABILITY*[1,20,34,48,65]
HEDIS PCR: Plan All-Cause Readmission	**Denominator:** enrollees ≥18 with acute inpatient discharge **Numerator:** unplanned readmission within 30 days (lower is better) **Exclusions:** planned readmissions (maintenance chemotherapy, transplant), hospice, psychiatric	AMD patients with comorbid frailty and fall-related injuries (OR 1.4–1.6 for falls) are at **elevated readmission risk**; structured transitions of care ensuring anti-VEGF injection continuity, AREDS2 reconciliation, and fall prevention **reduce readmission risk**

ABBREVIATIONS: AMD = age-related macular degeneration; HEDIS = Healthcare Effectiveness Data and Information Set; COA = Care for Older Adults; MA = Medicare Advantage; ESRD = end-stage renal disease; AREDS2 = Age-Related Eye Disease Study 2; VEGF = vascular endothelial growth factor; HR = hazard ratio; ADL = activities of daily living; GA = geographic atrophy; IADL = instrumental activities of daily living; PT = physical therapy; OT = occupational therapy; TRC = Transitions of Care; PCP = primary care provider; DMS-E = Depression Monitoring and Follow-Up; PHQ-9 = Patient Health Questionnaire-9; CI = confidence interval; ACP = Advance Care Planning; CPT = Current Procedural Terminology; AWV = Annual Wellness Visit; PCR = Plan All-Cause Readmission; FDA = U.S. Food and Drug Administration
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

5 CODING REMINDERS AND CASE EXAMPLES

Documentation Specificity

- **Stage/Severity:** Document **AMD subtype** (dry **H35.31** vs. wet **H35.32**) with **6th-character stage**; early, intermediate, or advanced (±subfoveal GA) for dry; active CNV, inactive CNV, or scar for wet; **H35.30** (unspecified) maps to no HCC[1,2,4]
- **Etiology:** Note **modifiable risk factors**; smoking (largest modifiable driver), hypertension, diabetes, family history, prior AREDS2/anti-VEGF exposure; supports comorbidity coding (**Z87.891** former smoker, **F17.21x** current, **I10**, **E11.x**) and cardiovascular risk linkage[1,25]
- **Current status:** Anchor each note with most recent VA **per eye** (**Snellen/ETDRS**); **OCT findings** (macular thickness, fluid, GA area in mm^2); **CNV activity if wet**; date of last specialist visit/injection[1,9]
- **Associated conditions:** Document depression (HR 1.15–1.28), fall risk (OR 1.4–1.6), diabetes (**HCC 37/38**), glaucoma (**H40.x**), cataract (**H25.x**); each carries independent HCC or quality-measure implications[21,34]
- **Chronicity:** AMD is **chronic and progressive** → document **at least annually** while active; state whether stable, progressing, or improving versus baseline; **avoid copy-forward** → stage and activity must be reassessed each review[1,9]

Annual Clinical Review and Confirmation

- **Annual review: H35.31xx/H35.32xx** require in-person **or** synchronous telehealth documentation while active; **update**: type; laterality; stage/activity; OCT findings; VA per eye with trend; AREDS2 or anti-VEGF status; smoking/BP/diabetes; functional status (reading, driving, falls, PHQ-9); specialist coordination[1,9]
- **Visit modality: All elements required**: type; laterality; stage/activity; imaging; VA trend; treatment status; cardiovascular risk; PHQ-9; plan; intermediate dry → document drusen/GA trajectory; advanced GA → quantify expansion rate (mm^2/year); wet → document CNV activity, injection frequency, VA response[1]
- **Clinical context:** Under CMS-HCC V28 **H35.32xx** (wet, any activity) map to **HCC 300** (RAF ~0.596); **H35.311x** (early) and **H35.312x** (intermediate) → risk of progression but **do not map to an HCC**; **H35.30** (unspecified) → **avoid when** type, laterality, and stage are determinable[7,8]
- **Avoid rollover: Do NOT** copy-forward **without updating**: stage/activity; imaging (GA area, fluid, CNV); VA per eye with trend; AREDS2 or anti-VEGF status; smoking; BP/diabetes; functional capability; PHQ-9. **If stage progresses** → **update code** (**H35.312x** → **H35.313x/314x**); if wet AMD activity changes → **update** (**H35.321** → **H35.322**). Functional shifts (driving loss, reading loss) → trigger **low-vision rehab/PT/OT referral**. **H35.30** (unspecified) **acceptable only temporarily** for new patients without imaging → **must be updated at next visit** with proper workup; never appropriate for established AMD[1,9]

Good Documentation is Comprehensive Coding

DOCUMENTATION ELEMENT	WHY IT MATTERS[1,2,4,9]
Type (Dry vs. Wet) + Stage/Activity Status	Enables **H35.31xx** vs. **H35.32xx** coding; stage/activity **drives treatment pathway**; essential for documentation and clinical tracking
Laterality (Right, Left, Bilateral, Unspecified)	**Determines code selection** (**5th character**); bilateral disease requires separate codes per eye **if stages differ** or **H35.31x3**/**H35.32x3** code; critical for VBC functional assessment (driving, ADL loss)
Imaging findings (OCT, OCT-A, FFA, Fundus photo)	**OCT confirms diagnosis**, **quantifies disease burden** (GA area, fluid volume, macular thickness); documents **baseline for monitoring progression**; justifies treatment initiation
Visual Acuity (Per Eye, ETDRS or Snellen Chart, Trend Over Time)	**VA trend is outcome measure**; detects **treatment response** (improvement, stabilization, decline); documents functional status; informs **driving/ADL eligibility**

DOCUMENTATION ELEMENT	WHY IT MATTERS[1,2,4,9]
AREDS2 Supplementation Status (Prescribed, Patient Adherence)	AREDS2 **reduces progression risk by 25%** in intermediate AMD; **adherence is VBC quality measure**; documents patient education on modifiable intervention
Anti-VEGF Injection Details (Agent, Frequency, Response, Adherence)	**Tracks**: treatment intensity, efficacy, and patient compliance; documents **decision-making rationale** (monthly vs. treat-and-extend); essential for billing/coding and clinical surveillance

ABBREVIATIONS: VBC = value-based care; ADL = activities of daily living; OCT = optical coherence tomography; OCT-A = optical coherence tomography angiography; FFA = fluorescein angiography; GA = geographic atrophy; ETDRS = Early Treatment Diabetic Retinopathy Study; VA = visual acuity; AREDS2 = Age-Related Eye Disease Study 2; AMD = age-related macular degeneration; VEGF = vascular endothelial growth factor; MEAT = monitor, evaluate, assess, and treat

EHR Workflow Tips

- **EHR TIP — Smartphrase]** Build a **.amd_visit dot phrase** that **auto-populates**: type-specific ICD-10 (**H35.31xx** dry, **H35.32xx** wet, with laterality and stage/activity), VA by eye, **AREDS2 status** (formulation, beta-carotene exclusion if smoker), specialist referral date/outcome, **Amsler grid result**, PHQ-9, fall-risk screen, and follow-up interval. Separate **.amd_urgent** for **acute conversion**: metamorphopsia onset date, laterality, suspected CNV findings, same-day specialist contact documented, anti-VEGF target ≤14 days. **Eliminates unspecified H35.30 coding**; supports MEAT in a single paste
- **[EHR TIP — Alert]** Filter "**AMD Active**" = **H35.31xx/H35.32xx** without ophthalmology or PCP visit in 12 months. "**Stage-to-HCC Check**" = flags **H35.30** (no HCC) **miscoded as active disease**; flags dry AMD without stage update after new imaging. "**AREDS2 Check**" = intermediate/advanced dry AMD without AREDS2 on medication list. "**Injection Tracking**" = active wet AMD (**H35.32x1**) without anti-VEGF or specialist visit in 8 weeks
- **[EHR TIP — Best Practice] Pin type-, laterality-, and stage-specific code** with imaging date (e.g., "Nonexudative AMD, left eye, intermediate, **H35.3121**, OCT [date]"), **not** "macular degeneration." **Code comorbidities individually** (depression **F32.x**, fall risk **R29.6**, hypertension **I10**). Document AREDS2 formulation with smoking-appropriate rationale. Track wet AMD patients for **injection adherence** and **LTFU risk** at every visit
- **[EHR TIP — Workflow] Fire BPA when**: stage not updated after new OCT/specialist note; **AREDS2 absent** for intermediate/advanced dry AMD; PHQ-9 not completed in 12 months; acute metamorphopsia documented **without same-day specialist contact**; specialist referral without return note in 30 days. Flag **H35.30 persisting >30 days** for specificity upgrade
- **[EHR TIP — Order Set]** "**AMD Annual Review**": VA by eye, Amsler grid, AREDS2 reconciliation, PHQ-9, fall-risk screen, smoking status, specialist visit confirmation, driving/ADL assessment, stage-update prompt. "**AMD Urgent Conversion**": same-day specialist contact (phone/fax with date/time), metamorphopsia onset/laterality, patient education on

anti-VEGF ≤14 days, transportation arrangement, 48-hour callback, presumptive **H35.32x1** pending confirmation

Brief Case Examples

SUCCESS — GA DETECTED, COMPLEMENT INHIBITOR INITIATED, COORDINATED CARE

SCENARIO

An 82-year-old female, Medicare Advantage, with intermediate/advanced dry AMD on routine dilated exam. **OCT**: bilateral GA — right eye 4.5 mm^2 subfoveal, left eye 2.1 mm^2 peripheral. VA OD 20/80, OS 20/60. Difficulty reading; **denies metamorphopsia**; Amsler grid stable. Former smoker, quit 10 years ago.

Documentation: "Bilateral GA secondary to AMD (**H35.3143** right eye, advanced with subfoveal GA; **H35.3142** left eye, advanced without subfoveal GA). **AREDS2 initiated**: lutein/zeaxanthin formula, no beta-carotene given smoking history. Urgent retinal specialist referral **within 2 weeks** for **complement inhibitor eligibility** (pegcetacoplan or avacincaptad pegol). **OT referral** for low-vision evaluation and home safety. PHQ-9 score 8 (subthreshold). **Amsler grid daily**; return sooner for new metamorphopsia, scotoma, or acute vision change."

Outcome: H35.3143 + **H35.3142** documented with full clinical course. Complement inhibitor initiated **within 3 weeks**; GA expansion slowed (18–22% reduction at 24 months). AREDS2 **slows GA progression** toward fovea. **All MEAT elements present**: stage-specific diagnosis with OCT, smoking-appropriate AREDS2, specialist referral timeline, OT referral, depression screening, home monitoring, and follow-up criteria.

PITFALL — ACUTE WET AMD CONVERSION MISSED, NON-SPECIFIC CODING

SCENARIO

A 79-year-old male, Medicare Advantage, with known AMD. Reports **wavy lines** left eye × 1 week, **mild central blur**. Exam: left eye shows **exudative changes**, **subretinal fluid**.

Documentation as written: "79M with macular degeneration. Age-related vision loss. Refer to eye doctor. **H35.30**." No OCT/FFA. No urgent referral; patient told to call eye doctor when convenient. No MEAT. Specialist seen 4 weeks later.

Consequence: (**1**) Acute metamorphopsia is the **cardinal sign of wet AMD conversion** requiring same-day specialist contact → treated as routine here. (**2**) Anti-VEGF within 14 days yields ~38% improvement; delay to day 28 **reduces to ~20%**. (**3**) **H35.30** (unspecified) **loses clinical complexity** and maps to no HCC. (**4**) No type, laterality, or CNV status → violates specificity requirements. (**5**) No imaging, MEAT, or patient education on urgency. **Preventable vision loss and downstream functional decline**.

RAF Impact: An unsupported acute code **creates audit exposure**: if the thrombus has resolved, **no HCC 300** (CNA RAF ~ 0.596) should be mapped, and the record **misrepresents the clinical state**. The omission of acuity, location, and the duration rationale **weakens continuity**, **quality reporting**, **anticoagulation safety**, and **audit defensibility**.

Fix: "79M with acute metamorphopsia left eye × 1 week; central scotoma. Left fundus: subretinal fluid, suspected CNV. Assessment: Suspected wet AMD, left eye, active CNV → time-sensitive (**H35.3231**). **URGENT same-day retinal specialist referral**: phone/fax flagged 'acute

metamorphopsia, <14 days onset → expedite.' **Patient educated**: wavy lines = blood vessel leakage requiring **immediate treatment**. **MEAT**: Monitor=Amsler grid daily. Evaluate= OCT/FFA within 3 days. Assess= CNV type/extent. Treat= anti-VEGF target 7–14 days from onset. Specialist appointment confirmed **within 48 hours**; callback 24 hours prior. Transportation arranged. **Z87.891** (nicotine history), **I10** (hypertension) if applicable."

REFERENCES

1.American Academy of Ophthalmology Preferred Practice Pattern Retina/Vitreous Committee, Vemulakonda GA, Bailey ST, et al. Age-Related Macular Degeneration Preferred Practice Pattern®. *Ophthalmology*. 2025;132(4):P1-P74. doi:10.1016/j.ophtha.2024.12.018

2.Fleckenstein M, Schmitz-Valckenberg S, Chakravarthy U. Age-Related Macular Degeneration: A Review. *JAMA*. 2024;331(2):147-157. doi:10.1001/jama.2023.26074

3.Heier JS, Brown DM, Shah SP, et al. Intravitreal Aflibercept Injection vs Sham as Prophylaxis Against Conversion to Exudative Age-Related Macular Degeneration in High-risk Eyes: A Randomized Clinical Trial. *JAMA Ophthalmol*. 2021;139(5):542-547. doi:10.1001/jamaophthalmol.2021.0221

4.Centers for Medicare & Medicaid Services (CMS), National Center for Health Statistics (NCHS), American Hospital Association (AHA), American Health Information Management Association (AHIMA). *ICD-10-CM Official Guidelines for Coding and Reporting, FY 2026*. U.S. Department of Health and Human Services; 2025. https://www.cms.gov/medicare/coding-billing/icd-10-codes

5.Rein DB, Wittenborn JS, Burke-Conte Z, et al. Prevalence of Age-Related Macular Degeneration in the US in 2019. *JAMA Ophthalmol*. 2022;140(12):1202-1208. doi:10.1001/jamaophthalmol.2022.4401

6.Liu TYA, Ko S, Rosettie KL, et al. Prevalence and Health Care Disparities of Retinal Conditions: A Meta-Analysis. *JAMA Ophthalmol*. 2026;144(5):378-387. doi:10.1001/jamaophthalmol.2026.0319

7.Centers for Medicare & Medicaid Services. *2026 Final ICD-10-CM Mappings (CMS-HCC V28)*. U.S. Department of Health and Human Services; 2025. https://www.cms.gov/medicare/health-plans/medicareadvtgspecratestats/risk-adjustors/2026-model-software

8.Centers for Medicare & Medicaid Services. *CMS-HCC Model Relative Factor Tables (Community, Non-Dual, Aged)*. 2024. https://www.cms.gov/files/document/revised-cms-hcc-model-relative-factor-tablespdf

9.Apte Rajendra S. Age-Related Macular Degeneration. *N Engl J Med*. 2021;385(6):539-547. doi:10.1056/NEJMcp2102061

10.Vu KV, Mitchell P, Dharamdasani Detaram H, Burlutsky G, Liew G, Gopinath B. Prevalence and risk factors for depressive symptoms in patients with neovascular age-related macular degeneration who present for anti-VEGF therapy. *Acta Ophthalmol (Copenh)*. 2021;99(4):e547-e554. doi:10.1111/aos.14635

11.Delcourt C, Hucteau E, Gattoussi S, et al. Association of treated neovascular AMD with disability and mood disorders: A longitudinal nationwide study. *Acta Ophthalmol (Copenh)*. Published online April 18, 2026. doi:10.1111/aos.70130

12.Choi A, Nawash BS, Du K, Ong J, Chhablani J. Barriers to care in neovascular age-related macular degeneration: Current understanding, developments, and future directions. *Surv Ophthalmol*. 2024;69(1):160-164. doi:10.1016/j.survophthal.2023.09.001

13.Okada M, Mitchell P, Finger RP, et al. Nonadherence or Nonpersistence to Intravitreal Injection Therapy for Neovascular Age-Related Macular Degeneration: A Mixed-Methods Systematic Review. *Ophthalmology*. 2021;128(2):234-247. doi:10.1016/j.ophtha.2020.07.060

14.Shahzad H, Mahmood S, McGee S, et al. Non-adherence and non-persistence to intravitreal anti-vascular endothelial growth factor (anti-VEGF) therapy: a systematic review and meta-analysis. *Syst Rev*. 2023;12(1):92. doi:10.1186/s13643-023-02261-x

15.Bjerager J, Schneider M, Potapenko I, et al. Diagnostic Accuracy of the Amsler Grid Test for Detecting Neovascular Age-Related Macular Degeneration: A Systematic Review and Meta-analysis. *JAMA Ophthalmol*. 2023;141(4):315-323. doi:10.1001/jamaophthalmol.2022.6396

16.Chew EY, Clemons TE, Bressler SB, et al. Randomized trial of a home monitoring system for early detection of choroidal neovascularization home monitoring of the Eye (HOME) study. *Ophthalmology*. 2014;121(2):535-544. doi:10.1016/j.ophtha.2013.10.027

17.Kang C, Lo JE, Zhang H, et al. Artificial intelligence for diagnosing exudative age-related macular degeneration. *Cochrane Database Syst Rev*. 2024;10(10):CD015522. doi: 10.1002/14651858.CD015522.pub2

18.Solomon SD, Lindsley K, Vedula SS, Krzystolik MG, Hawkins BS. Anti-vascular endothelial growth factor for neovascular age-related macular degeneration. *Cochrane Database Syst Rev*. 2019;3(3):CD005139. doi:10.1002/14651858.CD005139.pub4

19.Chakravarthy U, Bailey CC, Johnston RL, et al. Characterizing Disease Burden and Progression of Geographic Atrophy Secondary to Age-Related Macular Degeneration. *Ophthalmology*. 2018;125(6): 842-849. doi:10.1016/j.ophtha.2017.11.036

20.Mitchell P, Liew G, Gopinath B, Wong TY. Age-related macular degeneration. *Lancet Lond Engl*. 2018;392(10153):1147-1159. doi:10.1016/S0140-6736(18)31550-2

21.Tsang JY, Wright A, Carr MJ, et al. Risk of Falls and Fractures in Individuals With Cataract, Age-Related Macular Degeneration, or Glaucoma. *JAMA Ophthalmol*. 2024;142(2):96-106. doi:10.1001/jamaophthalmol.2023.5858

22.Spooner KL, Fraser-Bell S, Mehta H, et al. Lost to Follow-Up in Neovascular Age-Related Macular Degeneration: A Systematic Review of Global Trends, Risk Factors, and Clinical Consequences. *Ophthalmol J Int Ophtalmol Int J Ophthalmol Z Augenheilkd*. 2026;249(1):79-102. doi: 10.1159/000549177

23.US Preventive Services Task Force. Screening for Impaired Visual Acuity in Older Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2022;327(21):2123-2128. doi:10.1001/jama.2022.7015

24.Coleman HR, Chan CC, Ferris FL 3rd, Chew EY. Age-related macular degeneration. *Lancet Lond Engl*. 2008;372(9652):1835-1845. doi:10.1016/S0140-6736(08)61759-6

25.Babaker R, Alzimami L, Al Ameer A, et al. Risk factors for age-related macular degeneration: Updated systematic review and meta-analysis. *Medicine (Baltimore)*. 2025;104(8):e41599. doi:10.1097/MD.0000000000041599

26.Keenan TDL, Hébert M, Chew EY, Johnson MW. What Should Patients With Age-Related Macular Degeneration Eat? *Am J Ophthalmol*. 2026;288:12-21. doi:10.1016/j.ajo.2026.04.003

27.Frank RN, Puklin JE, Stock C, Canter LA. Race, iris color, and age-related macular degeneration. *Trans Am Ophthalmol Soc*. 2000;98:109-115; discussion 115-117.

28.Obeid A, Gao X, Ali FS, et al. Loss to Follow-up Among Patients With Neovascular Age-Related Macular Degeneration Who Received Intravitreal Anti–Vascular Endothelial Growth Factor Injections. *JAMA Ophthalmol*. 2018;136(11):1251-1259. doi:10.1001/jamaophthalmol.2018.3578

29.Ferris FL 3rd, Wilkinson CP, Bird A, et al. Clinical classification of age-related macular degeneration. *Ophthalmology*. 2013;120(4):844-851. doi:10.1016/j.ophtha.2012.10.036

30.Age-Related Eye Disease Study Research Group. A Simplified Severity Scale for Age-Related Macular Degeneration: AREDS Report No. 18. *Arch Ophthalmol*. 2005;123(11):1570-1574. doi:10.1001/archopht.123.11.1570

31.Agrón E, Domalpally A, Chen Q, Lu Z, Chew EY, Keenan TDL. An Updated Simplified Severity Scale for Age-Related Macular Degeneration Incorporating Reticular Pseudodrusen: Age-Related Eye Disease Study Report Number 42. *Ophthalmology*. 2024;131(10):1164-1174. doi:10.1016/j.ophtha.2024.04.011

32.Sivaprasad S, Banister K, Azuro-Blanco A, et al. Diagnostic Accuracy of Monitoring Tests of Fellow Eyes in Patients with Unilateral Neovascular Age-Related Macular Degeneration: Early Detection of Neovascular Age-Related Macular Degeneration Study. *Ophthalmology*. 2021;128(12):1736-1747. doi:10.1016/j.ophtha.2021.07.025

33.Lim JH, Wickremasinghe SS, Xie J, et al. Delay to treatment and visual outcomes in patients treated with anti-vascular endothelial growth factor for age-related macular degeneration. *Am J Ophthalmol*. 2012;153(4):678-686, 686.e1-2. doi:10.1016/j.ajo.2011.09.013

34.Hwang S, Kang SW, Kim SJ, et al. Impact of Age-Related Macular Degeneration and Related Visual Disability on the Risk of Depression: A Nationwide Cohort Study. *Ophthalmology*. 2023;130(6):615-623. doi:10.1016/j.ophtha.2023.01.014

35.Shughoury A, Boucher N, Aggarwal N, Ciulla TA. THREE-YEAR CLINICAL OUTCOMES IN GEOGRAPHIC ATROPHY: An Analysis of 18,712 Patient Eyes. *Retina Phila Pa*. 2025;45(2):188-197. doi:10.1097/IAE.0000000000004285

36.Niazi S, Krogh Nielsen M, Singh A, Sørensen TL, Subhi Y. Prevalence of Charles Bonnet syndrome in patients with age-related macular degeneration: systematic review and meta-analysis. *Acta Ophthalmol (Copenh)*. 2020;98(2):121-131. doi:10.1111/aos.14287

37.Borsellino PJ, Schauer S, Rivas A, Aharonian K, Vida TA. Filling in the Blind Spot: Integrating Charles Bonnet Syndrome Screening in Ophthalmology. *Clin Ophthalmol Auckl NZ*. 2025;19:3619-3657. doi:10.2147/OPTH.S547122

38.Hogg RE, Woodside JV, Gilchrist SECM, et al. Cardiovascular disease and hypertension are strong risk factors for choroidal neovascularization. *Ophthalmology*. 2008;115(6):1046-1052.e2. doi:10.1016/j.ophtha.2007.07.031

39.Phan C, Qiu M, Zhang AY. The association between intravitreal injections and glaucoma: an update. *Curr Opin Ophthalmol*. 2026;37(2):124-130. doi:10.1097/ICU.0000000000001191

40.Barry MJ, Nicholson WK, Silverstein M, et al. Screening for Depression and Suicide Risk in Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2023;329(23):2057-2067. doi: 10.1001/jama.2023.9297

41.Oncel D, Oncel D, Mishra K, Oncel M, Arevalo JF. Current Management of Subretinal Hemorrhage in Neovascular Age-Related Macular Degeneration. *Ophthalmol J Int Ophtalmol Int J Ophthalmol Z Augenheilkd*. 2023;246(5-6):295-305. doi:10.1159/000534440

42.Hollands H, Johnson D, Brox AC, Almeida D, Simel DL, Sharma S. Acute-Onset Floaters and Flashes: Is This Patient at Risk for Retinal Detachment? *JAMA*. 2009;302(20):2243-2249. doi:10.1001/jama.2009.1714

43.Yap DWT, Tan BKJ, Chong KTY, Wong TY, Cheung CMG. Persistence of Retinal Fluid after Anti-VEGF Treatment for Neovascular Age-Related Macular Degeneration: A Systematic Review and Meta-Analysis. *Ophthalmol Retina*. 2025;9(7):603-617. doi:10.1016/j.oret.2025.01.010

44.Sadda SR, Guymer R, Holz FG, et al. Consensus Definition for Atrophy Associated with Age-Related Macular Degeneration on OCT: Classification of Atrophy Report 3. *Ophthalmology*. 2018;125(4): 537-548. doi:10.1016/j.ophtha.2017.09.028

45.Agathos CP, Shanidze NM, Fletcher DC. Importance of Screening for Contrast Sensitivity, Falls, and Mobility Limitations in Older Adults With Maculopathy. *Am J Ophthalmol*. 2025;280:481-492. doi: 10.1016/j.ajo.2025.08.051

46.Chen KY, Chan HC, Chan CM. Comparative effectiveness and safety landscape of anti-VEGF therapies for neovascular age-related macular degeneration: Insights from a systematic review and network meta-analysis. *Biomed Pharmacother Biomedecine Pharmacother*. 2026;196:118881. doi:10.1016/j.biopha.2025.118881

47.Nichani PAH, Popovic MM, Dhoot AS, Pathak A, Muni RH, Kertes PJ. Treat-and-extend dosing of intravitreal anti-VEGF agents in neovascular age-related macular degeneration: a meta-analysis. *Eye Lond Engl*. 2023;37(14):2855-2863. doi:10.1038/s41433-023-02439-6

48.Khurana RN, Li C, Lum F. Loss to Follow-up in Patients with Neovascular Age-Related Macular Degeneration Treated with Anti-VEGF Therapy in the United States in the IRIS® Registry. *Ophthalmology*. 2023;130(7):672-683. doi:10.1016/j.ophtha.2023.02.021

49.The CATT Research Group. Ranibizumab and Bevacizumab for Neovascular Age-Related Macular Degeneration. *N Engl J Med*. 364(20):1897-1908. doi:10.1056/NEJMoa1102673

50.Martin DF, Maguire MG, Fine SL, et al. Ranibizumab and bevacizumab for treatment of neovascular age-related macular degeneration: two-year results. *Ophthalmology*. 2012;119(7):1388-1398. doi: 10.1016/j.ophtha.2012.03.053

51.Coulter JS, Randazzo J, Kary EE, Samar H. Falls in Older Adults: Approach and Prevention. *Am Fam Physician*. 2024;109(5):447-456.

52.Tzoumas N, Riding G, Williams MA, Steel DH. Complement inhibitors for age-related macular degeneration. *Cochrane Database Syst Rev*. 2023;6(6):CD009300. doi: 10.1002/14651858.CD009300.pub3

53.Hoguet A, Chen PP, Junk AK, et al. The Effect of Anti-Vascular Endothelial Growth Factor Agents on Intraocular Pressure and Glaucoma: A Report by the American Academy of Ophthalmology. *Ophthalmology*. 2019;126(4):611-622. doi:10.1016/j.ophtha.2018.11.019

54.Ngo Ntjam N, Thulliez M, Paintaud G, et al. Cardiovascular Adverse Events With Intravitreal Anti–Vascular Endothelial Growth Factor Drugs: A Systematic Review and Meta-analysis of Randomized Clinical Trials. *JAMA Ophthalmol*. 2021;139(6):610-619. doi:10.1001/jamaophthalmol.2021.0640

55.Evans JR, Lawrenson JG. Antioxidant vitamin and mineral supplements for slowing the progression of age-related macular degeneration. *Cochrane Database Syst Rev*. 2023;9(9):CD000254. doi: 10.1002/14651858.CD000254.pub5

56.Bakri SJ, Thorne JE, Ho AC, et al. Safety and Efficacy of Anti-Vascular Endothelial Growth Factor Therapies for Neovascular Age-Related Macular Degeneration: A Report by the American Academy of Ophthalmology. *Ophthalmology*. 2019;126(1):55-63. doi:10.1016/j.ophtha.2018.07.028

57.Sunaga T, Maeda M, Saulle R, et al. Anti-vascular endothelial growth factor biosimilars for neovascular age-related macular degeneration. *Cochrane Database Syst Rev*. 2024;6(6):CD015804. doi: 10.1002/14651858.CD015804.pub2

58.Zhang C, Friedman S, Mruthyunjaya P, Parikh R. The Biosimilar Paradox: How Anti-Vascular Endothelial Growth Factor Biosimilars Could Increase Patient and Overall Health Care Costs. *Ophthalmology*. 2023;130(9):966-972. doi:10.1016/j.ophtha.2023.04.019

59.Patel NA, Hoyek S, Al-Khersan H, Yannuzzi NA, Smiddy WE. A Cost Effectiveness Analysis of Avacincaptad Pegol for the Treatment of Geographic Atrophy with Comparison to Pegcetacoplan. *Ophthalmol Retina*. 2024;8(11):1061-1065. doi:10.1016/j.oret.2024.05.011

60.Khanani AM, Kotecha A, Chang A, et al. TENAYA and LUCERNE: Two-Year Results from the Phase 3 Neovascular Age-Related Macular Degeneration Trials of Faricimab with Treat-and-Extend Dosing in Year 2. *Ophthalmology*. 2024;131(8):914-926. doi:10.1016/j.ophtha.2024.02.014

61.Abu Al-Burak S, Shad J, Mihalache A, et al. Medicare Trends in Intravitreal Anti-VEGF Use: A Population-Based Study (2014-2023). *Ophthalmol Retina*. 2026;10(7):753-763. doi:10.1016/j.oret.2026.03.006

62.Jain A, Davis AM. Initiating Pharmacologic Treatment in Tobacco-Dependent Adults. *JAMA*. 2021;325(3):301-302. doi:10.1001/jama.2020.24790

63.U.S. Food and Drug Administration. *Approved Drug Products with Therapeutic Equivalence Evaluations (Orange Book)*. 46th ed. U.S. Food and Drug Administration; 2026. https://www.fda.gov/drugs/drug-approvals-and-databases/approved-drug-products-therapeutic-equivalence-evaluations-orange-book

64.Chaisai C, Patikorn C, Thavorn K, Lee SWH, Chaiyakunapruk N, Veettil SK. Incremental net monetary benefit of using varenicline for smoking cessation: A systematic review and meta-analysis of economic evaluation studies. *Addict Abingdon Engl*. 2024;119(7):1188-1202. doi:10.1111/add.16464

65.Jin H, Zhou Y, Stagg BC, Ehrlich JR. Association between vision impairment and increased prevalence of falls in older US adults. *J Am Geriatr Soc*. 2024;72(5):1373-1383. doi:10.1111/jgs.18879

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