Anthem

Clinical UM Guideline

Subject: Fundus Photography
Guideline #: CG-MED-47
Status: Reviewed

Publish Date: 04/10/2024
Last Review Date: 02/15/2024

Description

This document addresses the uses of fundus photography. Fundus photography uses a retinal camera to photograph regions of the vitreous, retina, choroid, and optic nerve to document abnormalities related to disease processes affecting the eye or to follow the progress of the disease in response to therapy. The photographs can be taken with analog or digital photography.

Note: Please see the following related document for additional information:

- CG-MED-35 Retinal Telescreening Systems

Clinical Indications

Medically Necessary:

A. Fundus photography is considered **medically necessary** to document abnormalities or disease processes (not screening) affecting the eye or to follow the progress of such eye disease when the results of fundus photography will be used to direct therapy and improve clinical outcomes. Examples include, but are not limited to the following:
   1. Diabetic retinopathy
   2. To further evaluate or monitor glaucoma or glaucoma suspects
   3. Retinal detachment and defects
   4. Further evaluation of an abnormal electro-oculogram (EOG) or oculomotor studies
   5. To further evaluate color vision deficiency
   6. To further evaluate suspected congenital anomalies of the posterior segment of the eye
   7. To evaluate or follow infection of the eye (for example, endophthalmitis, histoplasmosis, human immunodeficiency virus [HIV], syphilis, cytomegalovirus, congenital rubella, toxoplasmosis)
   8. To evaluate or follow ocular trauma or foreign body
   9. To evaluate or follow pseudotumor cerebri
   10. To evaluate or follow autoimmune disease involving the eye (for example, systemic lupus erythematosis, rheumatoid arthritis and other inflammatory polyarthropathies)
   11. To evaluate or follow sickle-cell anemia
   12. To evaluate or follow tuberous sclerosis
   13. Age-related macular degeneration
   14. Neoplasm of the choroid, cranial nerves, eyeball or retina
   15. Choroid disturbances such as chorioretinal inflammation
   16. To monitor individuals on anti-malarial therapy when changes are noted in the fundus during standard screening (for example, automated threshold visual field testing, optical coherence tomography, fundus autofluorescence imaging, multifocal electroretinogram)
   17. To further evaluate abnormal retinal function studies, visual evoked potentials, or other optic nerve disorders (for example, multiple sclerosis)
   18. To evaluate or follow other retinal disorders where the results of fundus photography will change the treatment of the member or improve outcome

B. Repeat or sequential fundus photographs are considered **medically necessary** only if they document a condition with the potential to change in appearance or size of the eye, and where such change would alter treatment.

Not Medically Necessary:

A. Fundus photography is considered **not medically necessary** when the criteria outlined above are not met and for all other conditions, including screening for ocular disorders.
B. Fundus photography is considered **not medically necessary** for retinopathy screening in individuals treated with chloroquine and hydroxychlorquine anti-malarial therapies.
C. Use of computer-based technology designed to superimpose a series of time-lapsed retinal images (for example, MatchedFlicker) is considered **not medically necessary** for monitoring the progression of retinal disease and for all other indications.

Coding

The following codes for treatments and procedures applicable to this guideline are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

When services may be Medically Necessary when criteria are met:

CPT

92250	Fundus photography with interpretation and report

ICD-10 Diagnosis

	All diagnoses except those listed as 'not medically necessary', including, but not limited to:
A18.50-A18.59	Tuberculosis of eye
A50.01	Early congenital syphilitic oculopathy
A50.30	Late congenital syphilitic oculopathy, unspecified

A50.44	Late congenital syphilitic optic nerve atrophy
A51.43	Secondary syphilitic oculopathy
A52.15	Late syphilitic neuropathy
A52.71	Late syphilitic oculopathy
B20	Human immunodeficiency virus [HIV] disease
B25.0-B25.9	Cytomegalovirus disease
B39.4-B39.9	Histoplasmosis
B50.0-B52.9	Malaria
B58.00-B58.09	Toxoplasma oculopathy
C69.00-C69.92	Malignant neoplasm of eye and adnexa
C79.49	Secondary malignant neoplasm of other parts of nervous system
D09.20-D09.22	Carcinoma in situ of eye
D31.00-D31.92	Benign neoplasm of eye and adnexa
D33.3	Benign neoplasm of cranial nerves
D49.81	Neoplasm of unspecified behavior of retina and choroid
D57.00-D57.819	Sickle-cell disorders
E08.00-E13.9	Diabetes mellitus
E50.7	Other ocular manifestations of vitamin A deficiency
E70.310-E70.329	Ocular/oculocutaneous albinism
G35	Multiple sclerosis
G45.3	Amaurosis fugax
G93.2	Benign intracranial hypertension [pseudotumor cerebri]
H15.031-H15.039	Posterior scleritis
H16.241-H16.249	Ophthalmia nodosa
H20.821-H20.829	Vogt-Koyanagi syndrome
H21.331-H21.339	Parasitic cyst of iris, ciliary body or anterior chamber
H27.111-H27.139	Subluxation/dislocation of lens
H30.001-H30.93	Chorioretinal inflammation
H31.001-H31.9	Other disorders of choroid
H32	Chorioretinal disorders in diseases classified elsewhere
H33.001-H33.8	Retinal detachments and breaks
H34.00-H34.9	Retinal vascular occlusions
H35.00-H35.9	Retinopathy of prematurity
H36.811-H36.89	Retinal disorders in diseases classified elsewhere
H40.001-H40.9	Glaucoma
H42	Glaucoma in diseases classified elsewhere
H43.00-H43.9	Disorders of vitreous body
H44.001-H44.9	Disorders of globe
H46.00-H46.9	Optic neuritis
H47.011-H47.9	Other disorders of optic (2nd) nerve and visual pathways
H53.121-H53.15	Visual loss/visual disturbances
H53.40-H53.489	Visual field defects
H53.50-H53.59	Color vision deficiencies
H53.63	Congenital night blindness
H53.71-H53.9	Vision sensitivity deficiencies, other/unspecified visual disturbances
L93.0-L93.2	Lupus erythematosus
M05.00-M05.9	Rheumatoid arthritis
M06.00-M06.9	Other rheumatoid arthritis
M08.00-M08.9A	Juvenile rheumatoid arthritis, other/unspecified juvenile arthritis
M32.19	Other organ or system involvement in systemic lupus erythematosus
M32.8-M32.9	Systemic lupus erythematosus, unspecified
P35.0-P35.9	Congenital viral diseases
P37.0-P37.9	Other congenital infectious and parasitic diseases
Q14.0-Q14.9	Congenital malformation of posterior segment of eye
Q15.0	Congenital glaucoma
Q85.1-Q85.9	Tuberous sclerosis, other/unspecified phakomatoses
Q87.0-Q87.89	Other specified congenital malformation syndromes affecting multiple systems
R44.1	Visual hallucinations
R48.3	Visual agnosia
R94.110-R94.118	Abnormal results of function studies of eye
S05.00XA-S05.92XS	Injury of eye and orbit
T37.2X1A-T37.2X5S	Poisoning by, adverse effect of antimalarials and drugs acting on other blood protozoa
T74.12XA-T74.12XS	Child physical abuse, confirmed
T74.4XXA-T74.4XXS	Shaken infant syndrome
T76.12XA-T76.12XS	Child physical abuse, suspected
Z08-Z09	Encounter for follow-up examination after completed treatment for malignant neoplasm, other than malignant neoplasm
Z79.899	Other long term (current) drug therapy
Z85.840	Personal history of malignant neoplasm of eye

When services are Not Medically Necessary:
For the procedure code listed above when criteria are not met, for the following diagnosis codes, or for situations designated in the Clinical Indications section as not medically necessary.

ICD-10 Diagnosis	
Z01.00	Encounter for examination of eyes and vision without abnormal findings
Z13.5	Encounter for screening for eye and ear disorders

When services are also Not Medically Necessary:
For the following procedure code, or when the code describes a procedure designated in the Clinical Indications section as not medically necessary.

CPT

92499	Unlisted ophthalmological service or procedure [when specified as computer-aided animation and analysis of time series retinal images for the monitoring of disease progression, unilateral or bilateral, with interpretation and report]

ICD-10 Diagnosis

All diagnoses

Discussion/General Information

Imaging of the fundus is useful to check its status and assess for any changes from a healthy condition of the eye. Fundus imaging can focus on the structure or function of the retina or diagnose ocular diseases. Retinoscopy allows direct visualization of small vessels and nerves and can be used to detect early signs of diseases that affect the eyes, circulation, or the brain. Conditions detectable by retinoscopy include glaucoma, age-related macular degeneration (AMD), diabetic retinopathy, and systemic diseases such as multiple sclerosis.

Diabetic retinopathy causes damage to the blood vessels in the retina. It is the most common diabetic eye disease and is a leading cause of blindness in American adults. It is caused by changes in the blood vessels of the retina. A 2013 study by Ku and colleagues reported on 360 individuals (706 eyes) who had fundus photographs and self-reported diabetes. Upon clinical grading of the photographs, 163 eyes had diabetic retinopathy and 51 eyes had vision-threatening diabetic retinopathy. The sensitivity for detecting diabetic retinopathy was 74% with a specificity of 92%; for vision-threatening diabetic retinopathy, sensitivity was 86% and specificity was 95%. The authors concluded that fundus photography was a valid screening tool for diabetic retinopathy.

The American Academy of Ophthalmology (AAO) 2019 Preferred Practice Pattern® (PPP) for diabetic retinopathy reports that the use of fundus photography has little value in cases with minimal diabetic retinopathy or when the diabetic retinopathy is unchanged from prior photographs, but fundus photography may be useful for documenting disease progression and treatment response. This PPP also encourages annual dilated eye screening exams for those with Type 2 diabetes mellitus who have not developed retinopathy or fundus photography screening stating:

> Given the known gap in accessibility of direct ophthalmologic screening, fundus photographic screening programs may help increase the chances that at-risk individuals will be promptly referred for more detailed evaluation and management.

In summary, the AAO's support of fundus photography in screening for diabetic retinopathy is only in light of potential inaccessibility to ophthalmic exams. Evidence comparing the use of fundus photography to standard screening by direct visualization is lacking.

Glaucoma is a group of diseases that damage the optic nerve of the eye and can lead to vision loss and blindness. The AAO has published a PPP Summary Benchmark for primary open-angle glaucoma (2020) and suspected primary open-angle glaucoma (2020) and recommended examination of the retinal nerve fiber layer of the fundus to include photography for both conditions. While the most desirable techniques for evaluating the optic nerve head and retinal nerve fiber layer are stereophotography or computer-based imaging, a nonstereoscopic photograph is an alternative.

AMD is a disorder of the macula which generally affects older adults and is characterized by loss of vision in the macula (center of the field of vision) caused by damage to the retina. Both 'dry' and 'wet' forms of AMD are major causes of blindness and visual deficits in developed countries. It was estimated that approximately 1.75 million people over the age of 40 in the United States (U.S.) were affected in at least one eye in 2004, with estimates of nearly 3 million to be affected by 2020 and an anticipated increase to 22 million by the year 2050 (AAO, 2020). The AAO PPP for AMD (2019) recommends, "Color fundus photographs may be obtained when angiography is performed, because they are useful in finding landmarks, evaluating serous detachments of the neurosensory retina and RPE [retinal pigment epithelium], and determining the etiology of blocked fluorescence." There is no recommendation by the AAO for fundus photography use as a screening tool in AMD.

Recommendations by the AAO (Marmor, 2011) do not advise the use of fundus photography for screening for chloroquine and hydroxychloroquine retinopathy from anti-malarial medication. They state that fundus photography should be used for documentation and monitoring purposes, but if bull's eye maculopathy is visible, this is considered to be a late change and the goal of screening is to find toxicity at an earlier stage.

MatchedFlicker® (EyeIC, Wayne, PA) received U.S. Food and Drug Administration (FDA) 501(k) premarket approval (PMA) in 2009 and is described as "a software program that is intended for use by health care professionals to collect, store, and spatially calibrate (i.e. register and align) images of the posterior segment of the human eye" (FDA, 2009). The majority of the literature on MatchedFlicker consists of small case studies or are non-comparative in nature. While some large-scale studies suggest that MatchedFlicker may be as effective or even more reliable than standard medical practices, its role in improving clinical results is not yet clear. (Cymbor, 2009; Syed 2012; VanderBeek, 2010). Additionally, no specialty guidelines recommend the use of MatchedFlicker technology in fundus photography analysis.

Definitions

Choroid: The vascular layer of the eye that lies between the retina and the sclera. It provides nourishment to outer layers of the retina.

Fundus: The interior surface of the eye, opposite the lens. The fundus includes the retina, optic disc, macula, fovea, and posterior pole.

Glaucoma: A disease characterized by destruction of the nerve fiber layer of the optic disc.

Optic nerve: The nerve that carries images of what is seen from the eye to the brain.

Retina: The light-sensitive layer of tissue that lines the inside of the eye and sends visual messages through the optic nerve to the brain.

Vitreous body: A transparent jellylike substance that fills the posterior segment of the eye, delimited by the hyaloid membrane.

References

Peer Reviewed Publications:

1. Abràmoff M, Garvin M, Sonka M. Retinal imaging and image analysis. IEEE Rev Biomed Eng. 2010; 3:169-208.

2. Bernardes R, Serranho P, Lobo C. Digital ocular fundus imaging: a review. Ophthalmologica. 2011; 226(4):161-181.
3. Cymbor M, Lear L, Mastrine M. Concordance of flicker comparison versus side-by-side comparison in glaucoma. Optometry. 2009; 80(8):437-441.
4. Ding J, Zou Y, Liu N, et al. Strategies of digital fundus photography for screening diabetic retinopathy in a diabetic population in urban China. Ophthalmic Epidemiol. 2012; 19(6):414-419.
5. Guigui S, Lifshitz T, Levy J. Screening for diabetic retinopathy: review of current methods. Hosp Pract (Minneap). 2012; 40(2):64-72.
6. Jiying Hu, Ruiting Chen, Ying Lu, et al. Single-field non-mydriatic fundus photography for diabetic retinopathy screening: a systematic review and meta-analysis. Ophthalmic Res. 2019; 62(2):61-67.
7. Ku JJ, Landers J, Henderson T, Craig JE. The reliability of single-field fundus photography in screening for diabetic retinopathy: the Central Australian Ocular Health Study. Med J Aust. 2013; 198(2):93-96.
8. Marmor MF, Kellner U, Lai TY, et al. Revised recommendations on screening for chloroquine and hydroxychloroquine retinopathy. Ophthalmology. 2011; 118(2):415-422.
9. Midena E, Frizziero L, Torresin T, et al. Optical coherence tomography and color fundus photography in the screening of age-related macular degeneration: A comparative, population-based study. PLoS One. 2020; 15(8):e0237352.
10. Shah SU, Seibles J, Park SS. Photographic diabetic retinopathy screening in an urban family practice clinic: effect on compliance to eye examination. Ophthalmic Surg Lasers Imaging. 2011; 42(5):383-389.
11. Syed ZA, Radcliffe NM, De Moraes CG, et al. Automated alternation flicker for the detection of optic disc haemorrhages. Acta Ophthalmol. 2012; 90(7):645-650.
12. VanderBeek BL, Smith SD, Radcliffe NM. Comparing the detection and agreement of parapapillary atrophy progression using digital optic disk photographs and alternation flicker. Graefes Arch Clin Exp Ophthalmol. 2010; 248(9):1313-1317.

Government Agency, Medical Society, and Other Authoritative Publications:

1. Institute for Clinical Systems Improvement. Diagnosis and management of type 2 diabetes mellitus in adults. Updated July 2014. Available at: https://www.icsi.org/wp-content/uploads/2019/02/Diabetes.pdf. Accessed on January 09, 2024.
2. American Academy of Ophthalmology. Preferred Practice Pattern®. For additional information visit the AAO website: https://www.aao.org/guidelines-browse. Accessed on January 09, 2024.
    - Age-Related Macular Degeneration (January 2019)
    - Diabetic Retinopathy (December 2019)
    - Glaucoma Summary Benchmarks (December, 2022)
    - Posterior Vitreous Detachment, Retinal Breaks, and Lattice Degeneration (October 2019)
    - Primary Open-Angle Glaucoma (September 2020)
    - Primary Open-Angle Glaucoma Suspect (September 2020)
    - Retina/Vitreous Panel (September 2022)
3. U.S. Food and Drug Administration 510(k) Premarket Notification Database. MatchedFlicker, EyeIC Corporation (EyeIC, Wayne, PA). Summary of Safety and Effectiveness. No. K090266. Rockville, MD. FDA. May 6, 2009. Available at: http://www.accessdata.fda.gov/cdrh_docs/pdf9/K090266.pdf. Accessed on January 04, 2024.

Websites for Additional Information

1. National Eye Institute. Available at: http://www.nei.nih.gov/. Accessed on January 09, 2024.

Index

Fundus photography

History

Status	Date	Action
Reviewed	02/15/2024	Medical Policy & Technology Assessment Committee (MPTAC) review. Updated Description, Discussion/General Information and References section.
	09/27/2023	Updated Coding section with 10/01/2023 ICD-10-CM changes; added H36.811-H36.89 replacing H36.
Reviewed	02/16/2023	MPTAC review. Updated Discussion/General Information and References section. Updated Coding section with additional diagnosis code examples.
Reviewed	02/17/2022	MPTAC review. Updated Discussion/General Information and References section. Updated Coding section with corrected diagnosis ranges (H30.001 and H30.811).
Reviewed	02/11/2021	MPTAC review. Updated Discussion/General Information and References section. Reformatted Coding section.
	10/01/2020	Updated Coding section with 10/01/2020 ICD-10-CM changes; added M06.0A.
Reviewed	02/20/2020	MPTAC review. Updated Discussion/General Information and References section.
	12/31/2019	Updated Coding section with 01/01/2020 CPT changes; added 92499 replacing 0380T deleted 12/31/2019.
Reviewed	03/21/2019	MPTAC review. Updated References section.
Reviewed	03/22/2018	MPTAC review. Updated header language from “Current Effective Date” to “Publish Date.” Updated Coding and References section.
Reviewed	05/04/2017	MPTAC review. Updated Discussion/General Information, Coding and References sections.
	10/01/2016	Updated Coding section to include 10/01/2016 ICD-10-CM diagnosis code changes.
Reviewed	05/05/2016	MPTAC review. Updated Discussion/General Information and References sections. Removed ICD-9 codes from Coding section.
Revised	05/07/2015	MPTAC review. Added MatchedFlicker to NMN Criteria. Updated Description, Coding, Discussion/General Information and References sections.
Reviewed	05/15/2014	MPTAC review. Updated General Information/Background, References and History sections.
New	05/09/2013	MPTAC review. Initial document development.

Federal and State law, as well as contract language, and Medical Policy take precedence over Clinical UM Guidelines. We reserve the right to review and update Clinical UM Guidelines periodically. Clinical guidelines approved by the Medical Policy & Technology Assessment Committee are available for general adoption by plans or lines of business for consistent review of the medical necessity of services related to the clinical guideline when the plan performs utilization review for the subject. Due to variances in utilization patterns, each plan may choose whether to adopt a particular Clinical UM Guideline. To determine if review is required for this Clinical UM Guideline, please contact the customer service number on the member's card.

Alternatively, commercial or FEP plans or lines of business which determine there is not a need to adopt the guideline to review services generally across all providers delivering services to Plan's or line of business's members may instead use the clinical guideline for provider education and/or to review the medical necessity of services for any provider who has been notified that his/her/its claims will be reviewed for medical necessity due to billing practices or claims that are not consistent with other providers, in terms of frequency or in some other manner.