Policy Name	Clinical Policy – Electrophysiological Testing
Policy Number	1334.00
Department	Clinical Product & Development
Subcategory	Medical Management
Original Approval Date	12/13/2018
Current MPC/CCO Approval Date	07/10/2024
Current Effective Date	10/01/2024

Company Entities Supported (Select All that Apply)
X Superior Vision Benefit Management
X Superior Vision Services
X Superior Vision of New Jersey, Inc.
X Block Vision of Texas, Inc. d/b/a Superior Vision of Texas
X Davis Vision
(Collectively referred to as 'Versant Health' or 'the Company')

ACRONYMS	
ERG	Electroretinogram
EOG	Electro Oculogram
VEP	Visual Evoked Potential

PURPOSE

To provide the medical necessity criteria to support the indication(s) for electrophysiological testing. Applicable procedure and diagnosis codes are also defined.

POLICY

A. BACKGROUND

Electrophysiological testing employs the modalities of Visual Evoked Potential (VEP), Electroretinogram (ERG) and Electrooculogram (EOG) to evaluate the function of components of the visual pathways including the optic nerve, occipital cortex, retinal rods and cones, outer layer elements of the retina and the retinal pigment epithelium. The data derived from these tests provides information in the diagnosis and management of ocular disease not otherwise available from other testing technologies.

B. Medically Necessary

Electrophysiological testing may be considered medically necessary when:

a. Investigating issues related to unexplained visual acuity or visual field loss;
b. Assessing whether a patient is malingering or not when other testing methods are inconclusive;[1]
c. Assessing the visual function of infants when there is a suspicion of abnormal vision or visual development; OBJ
d. Investigating optic neuropathies when other testing methods are inadequate.
e. Assessing vision in eyes with media opacities where other test modalities are not useful;
f. Assessing suspected neurological disease affecting the eyes, including to confirm the diagnosis of multiple sclerosis; OBJ
g. Investigating retinal and optic nerve function following trauma.
h. Detection of the disease or carrier states of an inherited visual disorder; [2]
i. Monitoring neurotoxicity or retinal toxicity associated with certain medications (e.g., hydroxychloroquine) is indicated with the primary diagnosis code Z79.899, long term (current) drug therapy;
j. Detection of optic neuritis at an early, subclinical stage;
k. Evaluate diseases of the optic nerve, such as ischemic optic neuropathy or pseudotumor cerebri;
l. Toxic or nutritional amblyopia;[3]
m. Neoplasm compression of the anterior visual pathways;
n. Non-glaucomatous optic nerve injury or atrophy.

C. Not Medically Necessary

1. Electrophysiological testing may not be medically necessary when:

   a. It is used as a screening test, (0333T);
   b. The test is administered subject to a standing order;
   c. Another diagnostic test(s) is more appropriate;
   d. Performed to confirm a diagnosis that has already been made;
   e. The test does not provide additional information for evaluation and management of the condition;
   f. To confirm the visual evoked potential, screening of visual acuity (CPT code 0464T) of any glaucoma-related diagnosis;
   g. Electroretinography (ERG) of any type (CPT 0509T, 92273, and 92274) for a glaucoma-related diagnosis.

2. Repeat electrophysiological testing is covered when medically justified for disability assessment, progressive disease, evaluating effectiveness of therapy, psychological or

[1] Hartlage, 2012.
[2] Daich, 2021
[3] Chiang, 2022

psychiatric components of visual loss and poor patient cooperation during initial testing. The medical rationale for repeat testing is required.

D. Documentation

Reimbursement must be supported by adequate and complete documentation in the patient's medical record that describes the procedure and the medical rationale. Retrospective reviews require the full operative report and medical care plan.

Documentation requires at a minimum all the following items. All items must be available upon request to initiate or sustain previous payments. Every page of the record must be legible and include appropriate patient identification information (e.g., complete name, date(s) of service). Services provided/ordered must be authenticated by the physician. The method used shall be handwritten or electronic signature. Stamped signatures are not acceptable.

The following documentation is required to support the medical necessity of electrophysiological testing:

1. Physician's order for the test(s) with medical rationale

2. Date(s) of testing

3. Interpretation and report to include:

    a. Test printouts showing proper performance and the test variables used during testing. The most recent standardized protocols by ISCEV should be used.
    b. Description of placement of electrodes and documentation of proper preparation (dilation indicated or not, full dark or light adaptation time noted, etc.).
    c. Reliability of the test. Do not submit tests of dubious value.
    d. Patient cooperation
    e. Test findings
    f. Comparison of results from previous tests
    g. Assessment, diagnosis
    h. Impact on treatment, prognosis

4. The medical record must contain copies of the digital images and be available upon request.

E. Procedural Detail

CPT Codes	
0333T	Visual evoked potential, screening of visual acuity, automated, with report
0509T	Electroretinography (ERG) with interpretation and report, pattern (pERG)
92265	Needle oculoelectromyography, 1 or more extraocular muscles, 1 or both eyes, with interpretation and report
92270	Electro-oculography with interpretation and report
92273	Electroretinography (ERG) with interpretation and report; full field (i.e., ffEG, flash ERG, Ganzfeld ERG)
92274	Electroretinography (ERG) with interpretation and report; multifocal (mfERG)
95930	Visual evoked potential (VEP) checkerboard or flash testing, central nervous system except glaucoma, with interpretation and report
Invalid Modifiers	
RT, LT and 50	Inherently bilateral procedures
58, 78 and 79	Not a surgical service

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RELATED POLICIES AND PROCEDURES	
n/a	

DOCUMENT HISTORY		
Approval Date	***Revisions***	***Effective Date***
12/13/2018	Initial policy	12/13/2018
12/18/2019	Annual review; deletion of experimental and investigational codes.	01/01/2020
10/28/2020	Added 2 CPT codes 0333T and 99265 and indication for long term therapeutic drug monitoring.	03/01/2021
10/06/2021	Annual review; no criteria changes.	04/01/2022
07/06/2022	Annual review; no criteria changes.	08/01/2022
07/12/2023	Annual review; no criteria changes.	09/01/2023
07/10/2024	Annual review; no criteria changes.	10/01/2024

REFERENCES AND SOURCES

1. Allon G, Friedrich Y, Mezer E, et.al. Verifying complaints of difficulties in night vision using electroretinography and dark adaptation tests. Doc Ophthalmol. 2020 Apr;140(2):169-180. doi: 10.1007/s10633-019-09729-z. Epub 2019 Oct 16. PMID: 31621038.
2. Barton JL, Garber JY, Klistorner A, et.al. The electrophysiological assessment of visual function in Multiple Sclerosis. Clin Neurophysiol Pract. 2019 May 8; 4:90-96. doi: 10.1016/j.cnp.2019.03.002. PMID: 31193661; PMCID: PMC6539333.
3. Castaldi E, Cicchini GM, Falsini B, et.al. Residual Visual Responses in Patients with Retinitis Pigmentosa Revealed by Functional Magnetic Resonance Imaging. Transl Vis Sci Technol. 2019 Dec 18;8(6):44. doi: 10.1167/tvst.8.6.44. PMID: 31867144; PMCID: PMC6922275.
4. Chiang TK, White KM, Kurup SK, et.al. Use of Visual Electrophysiology to Monitor Retinal and Optic Nerve Toxicity. Biomolecules. 2022 Sep 29;12(10):1390. doi: 10.3390/biom12101390. PMID: 36291599; PMCID: PMC9599231.
5. Corduneanu A, Chişca V, Ciobanu N, et.al. Evaluation of visual pathways using visual evoked potential in patients with diabetic retinopathy. Rom J Ophthalmol. 2019 Oct-Dec;63(4):367-371. PMID: 31915735; PMCID: PMC6943291.
6. Creel DJ. Electroretinograms. Handb Clin Neurol. 2019; 160:481-493. doi: 10.1016/B978-0-444-64032-1.00032-1. PMID: 31277870.
7. Daich Varela M, Georgiou M, Hashem SA, Weleber RG, Michaelides M. Functional evaluation in inherited retinal disease. Br J Ophthalmol. 2022 Nov;106(11):1479-1487. doi: 10.1136/bjophthalmol-2021-319994. Epub 2021 Nov 25. PMID: 34824084.
8. Dattilo M, Biousse V, Bruce BB, Newman NJ. Functional and simulated visual loss. Handb Clin Neurol. 2016; 139:329-341. doi: 10.1016/B978-0-12-801772-2.00029-1. PMID: 27719853.
9. Dobson V, Teller DY. Visual acuity in human infants: a review and comparison of behavioral and electrophysiological studies. Vision Res. 1978;18(11):1469-83. doi: 10.1016/0042-6989(78)90001-9. PMID: 364823.
10. Eriksson D, Schneck M, Schneider A, et al. A starting kit for training and establishing in vivo electrophysiology, intracranial pharmacology, and optogenetics. J Neurosci Methods. 2020 Apr 15; 336:108636. doi: 10.1016/j.jneumeth.2020.108636. Epub 2020 Feb 17. PMID: 32081674; PMCID: PMC7086230.Hamilton R, Bach M, Heinrich SP, et al. VEP estimation of visual acuity: a systematic review. Doc Ophthalmol. 2021 Feb;142(1):25-74. doi: 10.1007/s10633-020-09770-3. Epub 2020 Jun 2. PMID: 32488810; PMCID: PMC7907051.
11. Hartlage, L.C. (2012). Clinical Detection of Malingering. In: Reynolds, C., Horton, Jr., A. (eds) Detection of Malingering during Head Injury Litigation. Springer, Boston, MA. https://doi.org/10.1007/978-1-4614-0442-2_12
12. Heidari M, Radcliff AB, McLellan GJ, et.al. Evoked potential as a biomarker of remyelination. Proc Natl Acad Sci U S A. 2019 Dec 16;116(52):27074–83. doi: 10.1073/pnas.1906358116. Epub ahead of print. PMID: 31843913; PMCID: PMC6936696.
13. Heinrich SP, Strübin I, Bach M. VEP-based acuity estimation: unaffected by translucency of contralateral occlusion. Doc Ophthalmol. 2021 May 11. doi: 10.1007/s10633-021-09840-0. Epub ahead of print. PMID: 33977361.
14. Incesu AI, Sobacı G. Malingering or simulation in ophthalmology-visual acuity. Int J Ophthalmol. 2011;4(5):558-66. doi: 10.3980/j.issn.2222-3959.2011.05.19. Epub 2011 Oct 18. PMID: 22553721; PMCID: PMC3340730.

15. Incesu AI. Tests for malingering in ophthalmology. Int J Ophthalmol. 2013 Oct 18;6(5):708-17. doi: 10.3980/j.issn.2222-3959.2013.05.30. PMID: 24195054; PMCID: PMC3808926.
16. Jurkute N, Robson AG. Electrophysiology in neuro-ophthalmology. Handb Clin Neurol. 2021; 178:79-96. doi: 10.1016/B978-0-12-821377-3.00019-2. PMID: 33832688.
17. Knötzele J, Heinrich SP. Can VEP-based acuity estimate in one eye be improved by applying knowledge from the other eye? Doc Ophthalmol. 2019 Oct;139(2):161-168. doi: 10.1007/s10633-019-09700-y. Epub 2019 Jun 3. PMID: 31161576.
18. Lapajne L, Roškar S, Tekavčič Pompe M, et.al. Vision training with VEP biofeedback in amblyopia after the critical period. Doc Ophthalmol. 2020 May 28. doi: 10.1007/s10633-020-09774-z. Epub ahead of print. PMID: 32468275.
19. Pereira F, Matieli L, Sacai PY, et.al. Electrophysiological findings in delayed discovery of a metallic intraocular foreign body in a child: case report. Doc Ophthalmol. 2019 Dec;139(3):227-234. doi: 10.1007/s10633-019-09708-4. Epub 2019 Jul 8. PMID: 31286364.
20. Porciatti V, Chou TH. Using Noninvasive Electrophysiology to Determine Time Windows of Neuroprotection in Optic Neuropathies. Int J Mol Sci. 2022 May 20;23(10):5751. doi: 10.3390/ijms23105751. PMID: 35628564; PMCID: PMC9145583.
21. Qin X, Wang W, Hu L, et.al. Feature study of hysterical blindness EEG based on FastICA with combined-channel information. Technol Health Care. 2015;23 Suppl 2: S325-33. doi: 10.3233/THC-150969. PMID: 26410499.
22. Resende AF, Sanvicente CT, Eshraghi H, et.al. Test-retest repeatability of the pattern electroretinogram and flicker electroretinogram. Doc Ophthalmol. 2019 Dec;139(3):185-195. doi: 10.1007/s10633-019-09707-5. Epub 2019 Jul 16. PMID: 31312944.
23. Rubin GA, Biviano A, Dizon J, et al. Performance of electrophysiology procedures at an academic medical center amidst the 2020 coronavirus (COVID-19) pandemic. J Cardiovasc Electrophysiol. 2020 Jun;31(6):1249-1254. doi: 10.1111/jce.14493. Epub 2020 Apr 20. PMID: 32281214; PMCID: PMC7262273.
24. Schoenfeld MA, Hassa T, Hopf JM, et.al. Neural correlates of hysterical blindness. Cereb Cortex. 2011 Oct;21(10):2394-8. doi: 10.1093/cercor/bhr026. Epub
25. Senger C, Moreto R, Watanabe SES, et.al. Electrophysiology in Glaucoma. J Glaucoma. 2020 Feb;29(2):147-153. doi: 10.1097/IJG.0000000000001422. PMID: 31809397.
26. Senger C, Moreto R, Watanabe SES, et.al. Electrophysiology in Glaucoma. J Glaucoma. 2020 Feb;29(2):147-153. doi: 10.1097/IJG.0000000000001422. PMID: 31809397.
27. Shafer TJ. Application of Microelectrode Array Approaches to Neurotoxicity Testing and Screening. Adv Neurobiol. 2019; 22:275-297. doi: 10.1007/978-3-030-11135-9_12. PMID: 31073941.
28. Vatcher D, Dorfman AL, Shen Y, et.al. Revealing a retinal facilitatory effect with the multifocal ERG. Doc Ophthalmol. 2019 Apr;138(2):117-124. doi: 10.1007/s10633-019-09674-x. Epub 2019 Jan 31. PMID: 30706292.
29. Vincent, A, Robson, AG, Holder, GE. Pathognomonic (Diagnostic) ERGs a Review and Update. *Retina, the Journal of Retinal and Vitreous Diseases.* 33.1 (2013): 5-12.
30. Wang H, Li F, Li J et al. Electrophysiology as a prognostic indicator of visual recovery in diabetic patients undergoing cataract surgery. Graefes Arch Clin Exp Ophthalmol. 2021 Jul;259(7):1879-1887. doi: 10.1007/s00417-021-05100-8. Epub 2021 Apr 6. PMID: 33825028; PMCID: PMC8277643.
31. Yuan X, Feng Y, Li D, et.al. Unilateral visual impairment in a patient undergoing chemotherapy: a case report and clinical findings. BMC Ophthalmol. 2019 Nov 21;19(1):236. doi: 10.1186/s12886-019-1246-3. PMID: 31752765; PMCID: PMC6873404.

32. Zeng Y, Cao D, Yu H, et.al. Early retinal neurovascular impairment in patients with diabetes without clinically detectable retinopathy. Br J Ophthalmol. 2019 Dec;103(12):1747-1752. doi: 10.1136/bjophthalmol-2018-313582. Epub 2019 Jan 23. PMID: 30674454.
33. Zheng X, Xu G, Zhang K, et al. Assessment of Human Visual Acuity Using Visual Evoked Potential: A Review. Sensors (Basel). 2020 Sep 28;20(19):5542. doi: 10.3390/s20195542. PMID: 32998208; PMCID: PMC7582995.

SOURCES

1. American Academy of Ophthalmology; Retina Summary Benchmarks – 2023. https://www.aao.org/education/summary-benchmark-detail/retina-summary-benchmarks-2020. Accessed 4/2024.
2. American Academy of Ophthalmology. Electrooculogram (EOG), 2024. https://eyewiki.org/Electrooculogram. Accessed 4/2024.
3. American Academy of Ophthalmology: Inherited Retinal Diseases. 2018.. https://www.aao.org/eyenet/article/inherited-retinal-diseases. Accessed 4/2024.
4. CMS article A57060, “Billing and Coding: Visual Electrophysiology Testing.” https://www.cms.gov/medicare-coverage-database/view/article.aspx?articleid=57060&ver=7&=. Accessed 6/2024.
5. International Society for Clinical Electrophysiology of Vision (ISCEV). Standards, Guidelines, and Extended Protocols. https://iscev.wildapricot.org/standards. Accessed 4/2024.