

Policy Name	Clinical Policy – Electrophysiological Testing
Policy Number	1334.00
Department	Clinical Product & Strategy
Subcategory	Medical Management
Original Approval Date	12/13/2018
Current MPC/CCO Approval Date	07/12/2023
Current Effective Date	09/01/2023

Company Entities Supported (Select All that Apply) <input checked="" type="checkbox"/> Superior Vision Benefit Management <input checked="" type="checkbox"/> Superior Vision Services <input checked="" type="checkbox"/> Superior Vision of New Jersey, Inc. <input checked="" type="checkbox"/> Block Vision of Texas, Inc. d/b/a Superior Vision of Texas <input type="checkbox"/> Davis Vision (Collectively referred to as 'Versant Health' or 'the Company')
--

ACRONYMS	
VEP	Visual Evoked Potential
ERG	Electroretinogram
EOG	Electro Oculogram

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.
- c. Assessing the visual function of infants when there is a suspicion of abnormal vision or visual development.
- 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.
- g. Investigating retinal and optic nerve function following trauma.
- h. Detection of the disease or carrier states of an inherited visual disorder.
- 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. To confirm diagnosis of multiple sclerosis when clinical criteria are inconclusive.
- k. Detection of optic neuritis at an early, subclinical stage.
- l. Evaluate diseases of the optic nerve, such as ischemic optic neuropathy or Pseudotumor cerebri.
- m. Toxic or nutritional amblyopia.
- n. Neoplasm compression of the anterior visual pathways.
- o. 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 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.

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. It is expected that the most recent standardized protocols by ISCEV will 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 bill tests of dubious value.
 - d. Patient cooperation
 - e. Test findings
 - f. Comparison (when applicable) – How do today's results differ from prior 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
Valid Modifiers	
26	Professional Component
TC	Technical Component
Invalid Modifiers	
RT, LT and 50	Inherently bilateral procedures
58, 78 and 79	Not a surgical service

DISCLAIMER and COPYRIGHTS

This clinical policy is provided for information purposes only and does not constitute medical advice. Versant Health, Inc., and its affiliates (the “Company”) do not provide health care services and cannot guarantee any results or outcomes. Treating doctors are solely responsible for determining what services or treatments to provide to their patients. Patients (members) should always consult their doctor before making any decisions about medical care.

Subject to applicable law, compliance with this clinical policy is not a guarantee of coverage or payment. Coverage is based on the terms of an individual’s particular benefit plan document, which may not cover the service(s) or procedure(s) addressed in this clinical policy.

The terms of the individual’s specific clinical plan are always determinative. Every effort has been made to ensure that the information in this clinical policy is accurate and complete, however the Company does not guarantee that there are no errors in this policy or that the display of this file on a website is without error. The company and its employees are not liable for any errors, omissions, or other inaccuracies in the information, product, or processes disclosed herein. Neither the Company nor the employees represent that the use of such information, products, or processes will not infringe on privately owned rights. In no event shall the Company be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of such information, product, or process.

COMPANY’S COPYRIGHT STATEMENT

Except for any copyrights described below, this clinical policy is confidential and proprietary, and no part of this clinical policy may be copied without Versant Health, or its applicable affiliates expressing prior written approval.

AMA COPYRIGHT STATEMENT

CPT© 2002-2023 is the copyright of the American Medical Association. All Rights Reserved. CPT™ is a registered trademark of the American Medical Association. Applicable FARS/DFARS Apply to Government Use. Fee schedules, relative value units, conversion factors and/or related components are not assigned by the AMA, are not part of CPT, and the AMA is not recommending their use. The AMA does not directly or indirectly practice medicine or dispense medical services. The AMA assumes no liability for data contained or not contained herein.

RELATED POLICIES AND PROCEDURES	
n/a	

DOCUMENT HISTORY		
<i>Approval Date</i>	<i>Revisions</i>	<i>Effective Date</i>
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

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. Bach, M, et al. International Society for Clinical Electrophysiology (ISCEV) standard for clinical pattern electroretinography (PERG): 2012 update. *Doc Ophthalmol* 126 (2013): 1-7. Accessed 9.19.2019.
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. Cheng N, Murari K. OSERR: an open-source standalone electrophysiology recording system for rodents. *Sci Rep*. 2020 Oct 12;10(1):16996. doi: 10.1038/s41598-020-73797-4. PMID: 33046761; PMCID: PMC7552399.

5. Corduneanu A, Chișca 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. 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.
8. 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.
9. Gundogan FC, Sobaci G, Bayer A. Pattern visual evoked potentials in the assessment of visual acuity in malingering. *Ophthalmology*. 2007 Dec;114(12):2332-7. doi: 10.1016/j.ophtha.2007.04.026. Epub 2007 Jul 5. PMID: 17618689.
10. Hamilton R, Bach M, Heinrich SP, et al. ISCEV extended protocol for VEP methods of estimation of visual acuity. *Doc Ophthalmol*. 2021 Feb;142(1):17-24. doi: 10.1007/s10633-020-09780-1. Epub 2020 Jul 16. PMID: 32676804; PMCID: PMC7906925.
11. 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.
12. Heidari M, Radcliff AB, McLellan GJ, et.al, August BK, Sebo D, Field AS, Duncan ID. Evoked potentials 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. Kim AHJ, Sparks JA, Liew JW, et al; COVID-19 Global Rheumatology Alliance. A Rush to Judgment? Rapid Reporting and Dissemination of Results and Its Consequences Regarding the Use of Hydroxychloroquine for COVID-19. *Ann Intern Med*. 2020 Jun 16;172(12):819-821. doi: 10.7326/M20-1223. Epub 2020 Mar 30. Erratum in: *Ann Intern Med*. 2020 Jun 16;172(12):844. PMID: 32227189; PMCID: PMC7138335.
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. Kwon SH, Park JE, Cho YH, et al. Effect of *Vibrio*-Derived Extracellular Protease vEP-45 on the Blood Complement System. *Biology (Basel)*. 2021 Aug 18;10(8):798. doi: 10.3390/biology10080798. PMID: 34440030; PMCID: PMC8389632.

19. 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.
20. Lara, WC, Jordan, BL, Hope, GM, et.al. Fast Oscillations of the Electro-oulogram in Cystic Fibrosis. *Invest. Ophthalmol. Vis. Sci.* 2003; 44(13):4957.
21. Lin Y, Xu CL, Velez G. et.al Novel REEP6 gene mutation associated with autosomal recessive retinitis pigmentosa. *Doc Ophthalmol.* 2020 Feb;140(1):67-75. doi: 10.1007/s10633-019-09719-1. Epub 2019 Sep 19. PMID: 31538292; PMCID: PMC7310602.
22. Moss, Hart, Moura-Coelho Nuno. Best Disease and Best electrophinopathies. July 2019. American Academy of Ophthalmology, reviewed. Accessed 9.9.2019.
23. 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.
24. Perlman I, Kondo M, Chelva E, et.al. ISCEV extended protocol for the S-cone ERG. *Doc Ophthalmol.* 2020 Apr;140(2):95-101. doi: 10.1007/s10633-019-09730-6. Epub 2019 Nov 20. PMID: 31749034.
25. 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.
26. Qiao N, Song M, Ye Z, He W, Ma Z, Wang Y, Zhang Y, Shou X. Deep Learning for Automatically Visual Evoked Potential Classification During Surgical Decompression of Sellar Region Tumors. *Transl Vis Sci Technol.* 2019 Nov 20;8(6):21. doi: 10.1167/tvst.8.6.21. PMID: 31788350; PMCID: PMC6871542. Qin X, Wang W, Hu L, Wang X, Yuan X. 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.
27. 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.
28. Robson AG, Nilsson J, Li S, et.al. ISCEV guide to visual electrodiagnostic procedures. *Doc Ophthalmol.* 2018 Feb;136(1):1-26. doi: 10.1007/s10633-017-9621-y. Epub 2018 Feb 3. PMID: 29397523; PMCID: PMC5811581.
29. 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.
30. Sattigeri RM, Pillai SB, Jha PK, et al . Volume expansive pressure (VEP) driven non-trivial topological phase transition in LiMgBi. *Phys Chem Chem Phys.* 2020 Feb 28;22(8):4602-4609. doi: 10.1039/c9cp06155j. Epub 2020 Feb 13. PMID: 32051982.
31. 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
32. 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.
33. 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.
34. Seo KJ, Artoni P, Qiang Y, et al. Transparent, Flexible, Penetrating Microelectrode Arrays with Capabilities of Single-Unit Electrophysiology. *Adv Biosyst.* 2019 Mar;3(3): e1800276. doi: 10.1002/adbi.201800276. Epub 2019 Jan 8. PMID: 32627399.

35. 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.
36. Tao Y, Cai L, Zhou D, et.al. CoPP-Induced-Induced HO-1 Overexpression Alleviates Photoreceptor Degeneration with Rapid Dynamics: A Therapeutic Molecular Against Retinopathy. *Invest Ophthalmol Vis Sci.* 2019 Dec 2;60(15):5080-5094. doi: 10.1167/iovs.19-26876. PMID: 31825462.
37. Vatcher D, Dorfman AL, Shen Y, You JY, Sun V, Khan A, Polomeno RC, Lachapelle P. 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.
38. 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.
39. 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.
40. Young, B, Eggenberger, E, Kaufman, D. Current electrophysiology in ophthalmology: a review. *Current Opinion Ophthalmology.* 23 (2012): 497-505.
41. 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.
42. 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.
43. 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; Quality of Care Secretariat, Hoskins Center for Quality Eye Care. Guidelines on clinical assessment of patients with retinal degeneration. 2022.
2. American Academy of Ophthalmology. Electrooculogram (EOG), Apr 2019.
3. American Academy of Ophthalmology: Clinical Statement. Recommendations on Clinical Assessment of Patients with Inherited Retinal Degenerations. June 2016. <https://www.aao.org/clinical-statement/recommendations-on-clinical-assessment-of-patients> Accessed 9.19.2019.
4. International Society for Clinical Electrophysiology of Vision (ISCEV). Standards, Guidelines, and Extended Protocols. <https://iscev.wildapricot.org/standards>. Accessed Sept 2019.