

# Canadian Society of Clinical Neurophysiologists (CSCN) EEG Examination

## 2017 READING LIST

### INTRODUCTION

This reading list was prepared by the Chief Examiner with input from other experienced CSCN EEG examiners. The list was prepared to assist candidates in their preparation for the CSCN EEG examination. This list is not intended to be all inclusive and a quick perusal will reveal overlap (or duplication) of some topics. Some individuals will undoubtedly prefer one publication, textbook, or EEG atlas compared to another that covers the same or similar material. It is not the intention of the Examination Board to promote (or exclude) specific references and the following are put forward only as potentially useful sources of information. You may wish to use this reading list in conjunction with the CSCN EEG Examination Board "Outline of Content" to pic s document.

### EEG STANDARDS AND TECHNOLOGY

(Note: Candidates are strongly encouraged to review the published guidelines listed below).

### TEXTBOOKS

- Tyner FS, Knott Jr, Mayer WB. Fundamental of EEG Technology. Volume 1. Lippincott, Williams, and Wilkins. 1983.
  - Comment: An excellent "general" EEG technology text BUT NOT useful for important DIGITAL EEG technical aspects (see other references, below)

### Review Papers and Selected Book Chapters

- Task Force of the Canadian Society of Clinical Neurophysiologists. Minimal Standards for Electroencephalography in Canada. 2017 guidelines <http://www.cbret.org/minimal-technical-guidelines>
- Guidelines for visual- sensitive EEG testing. Can J Neural Sci 2008 May;35(2):133-9.
- International Organization of Societies for Electrophysiological Technology. Guidelines for Digital EEG. <http://www.oset.org/plaatjes/GuidesdigitEEGOSETJG1299RTF%5B1%5D.doc>

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- American Clinical Neurophysiology Society Guidelines 1 to 7. J Clin Neurophysiol 33: 303-332, 2016
- American Clinical Neurophysiology Society Guideline 2: Guidelines for Standard Electrode Position Nomenclature. J Clin Neurophysiol 2016;33: 308-311, 2016
- Hirsch LJ, LaRoche SM, Gaspard N, et al. American clinical neurophysiology society's standardized critical care EEG terminology: 2012 version. J Clin Neurophysiol 30:1-27, 2013
- Vincent Alvarez and Andrea O. Rossetti. Clinical use of EEG in the ICU: technical settings. J Clin Neurophysiol 32: 481-485, 2015
- Raoul Sutter and Peter W. Kaplan. Clinical and electroencephalographic correlates of acute encephalopathy. J. Clin Neurophysiol 30: 443-453, 2013
- Udaya Seneviratne. Rational manipulation of digital EEG: pearls and pitfalls. J Clin Neurophysiol 2014;31: 507-516, 2014
- Gerhard Bauer, Eugen Trinka and PW Kaplan. EEG patterns in hypoxic encephalopathies (post-cardiac arrest syndrome): fluctuations, transitions, and reactions. J Clin Neurophysiol 30: 477-489, 2013
- Harper PF, Sannit TS. A review of International Ten-Twenty System of Electrode Placement. Grass Instrument Company. 1974. (Note: may purchase via [www.grass-telefactor.com](http://www.grass-telefactor.com) and follow links to educational literature; alternatively most EEG Laboratories likely have this publication available).
- Sperling, MR, Guina L. The necessity for sphenoidal electrodes in the presurgical evaluation of temporal lobe epilepsy: Pro Position. J Clin Neurophysiol 2003; 20(5):299-304.
- Blume WT. The necessity for sphenoidal electrodes in the presurgical evaluation of temporal lobe epilepsy: Con Position. J Clin Neurophysiol 2003; 20(5):305-310.
- Badawy RA, Harvey AS, Macdonell RA. Cortical hyperexcitability and epileptogenesis: Understanding the mechanisms of epilepsy – part 2. J Clin Neurosci. 2009 Mar;16(3):355-65.
- Badawy RA, Harvey AS, Macdonell RA. Cortical hyperexcitability and epileptogenesis: Understanding the mechanisms of epilepsy – part 2. J Clin Neurosci. 2009 Apr;16(4):485-500
- Lagerlund TD. Electrical safety in the laboratory and hospital. Chapter 2. pp 21-30. In: Clinical Neurophysiology. (ed. Jasper Daube and Devon Rubin). Contemporary Neurology Series. Volume 46. Oxford University Press 2009

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- Lagerlund TD. Digital signal processing. Chapter 4. pp 53-63. In: Clinical Neurophysiology. (ed. Jasper Daube and Devon Rubin). Contemporary Neurology Series. Volume 46. Oxford University Press 2009
- Daube JR and Stead SM. Basics of neurophysiology. Chapter 5. pp 69-93. In: Clinical Neurophysiology. (ed. Jasper Daube and Devon Rubin). Contemporary Neurology Series. Volume 46. Oxford University Press 2009
- Fisch and Spehlmann's EEG Primer: Basic Principles of Digital and Analog EEG. Bruce Fisch. Elsevier. 1999. Chapter 3 "Digital and analog EEG instruments: parts and functions. pp 35-72.
  - Comment: This chapter, and particularly the sections on analog-to-digital conversion and digital filters, is particularly well written.

Badawy RA, Harvey AS, Macdonell RA. Cortical hyperexcitability and epileptogenesis: understanding the mechanisms of **epilepsy** - part 1. J Clin Neurosci. **2009** Mar;16(3):355-65.

Badawy RA, Harvey AS, Macdonell RA. Cortical hyperexcitability and epileptogenesis: Understanding the mechanisms of **epilepsy** - part 2. J Clin Neurosci. **2009** Apr;16(4):485-500.

- Epstein CM. Digital EEG: trouble in paradise? J Clin Neurophysiol 2006; 23(3) 190-193.
- Lesser RF, Ludges H, Dinner DS, Morris H. An introduction to the basic concepts of polarity and localization. J Clin Neurophysiol 2 (1): 45-61, 1985.
- Knott Jr. Further thoughts on polarity, montages and localization. J Clin Neurophysiol 2 (1): 63-75, 1985.
- Misulis KE. Basic electronics for clinical neurophysiology. J Clin Neurophysiol 6(1): 41-74, 1989
- Dash D. et al. Update on Minimal Standards for Electroencephalography in Canada: A Review by the Canadian Society of Clinical Neurophysiologists Volume 44, Issue 6. November 2017, pp. 631-642
- Herman ST et al. Critical Care Continuous EEG Task Force of the American Clinical Neurophysiology Society. Consensus statement on continuous EEG in critically ill adults and children, part I: indications. J Clin Neurophysiol. 2015 Apr;32(2):87-95.
- Herman ST et al. Critical Care Continuous EEG Task Force of the American Clinical Neurophysiology Society. Consensus statement on continuous EEG in critically ill adults and children, part II: personnel, technical specifications, and clinical practice. J Clin Neurophysiol. 2015 Apr;32(2):96-108.
- Koutroumanidis M. et al. The role of EEG in the diagnosis and classification of the epilepsy syndromes: a tool for clinical practice by the ILAE Neurophysiology Task Force (Part 1). Epileptic Disord. 2017 Sep 1;19(3):233-298.

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- Koutroumanidis M. et al. The role of EEG in the diagnosis and classification of the epilepsy syndromes: a tool for clinical practice by the ILAE Neurophysiology Task Force (Part 2). *Epileptic Disord.* 2017 Dec 1;19(4):385-437
- Scheffer IE, et al. ILAE classification of the epilepsies: Position paper of the ILAE Commission for Classification and Terminology. *Epilepsia.* 2017 . *J Clin Neurophysiol* Apr;58(4):512-521
- Shellhaas RA, Chang T, Tsuchida T, Scher MS, Riviello JJ, Abend NS, Nguyen S, Wusthoff CJ, Clancy RR. The American Clinical Neurophysiology Society's Guideline on Continuous Electroencephalography Monitoring in Neonates. *J Clin Neurophysiol.* 2011 Dec;28(6):611-7
- Nick Kane et al. A revised glossary of terms most commonly used by clinical electroencephalographers and updated proposal for the report format of the EEG findings. Revision 2017. *Clinical Neurophysiology Practice* 2, 170–185, 2017.
- Sutter R and Kaplan PW. EEG criteria for nonconvulsive status epilepticus : synopsis and comprehensive survey. *J Clin Neurophysiol* 53 (suppl. 3): 1-51, 2012

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### PHYSIOLOGY

#### REVIEW PAPERS

- Gloor P. Neuronal generators and the problem of localization in electroencephalography: Application of volume conductor theory to electroencephalography. *J Clin Neurophysiol* 1985; 2(4):327-354
- Olejnicz P. Neurophysiologic Basis of EEG. *Journal of Clinical Neurophysiology*. 2006;23(3): 186-189.
- Lagerlund TD. Volume conduction. Chapter 3, pp 29-39 In: *Clinical Neurophysiology* (ed Jasper Daube). Contemporary Neurology Series. Volume 46. 1996. F.A. Davis Company (publisher)
- Lothman EW. The neurobiology of epileptiform discharges. *American Journal of EEG Technology* 1993; 33:93-112.
  - **Comment:** A relatively simple "first read" of a potentially difficult topic that is covered in more depth in other papers/chapters cited below.
- Schwartzkroin, PA. Basic mechanisms of epileptogenesis. In: *The Treatment of Epilepsy: Principles and Practice* (ed. Elaine Wyllie). Lea and Febiger, Publishers.
- Blume WT. Invited Review: Clinical and basic neurophysiology of generalized epilepsies. *Can J Neurol Sci* 2002; Feb (1): 6-18.
- Blumenfeld H. Cellular and network mechanisms of spike-wave seizures *Epilepsia* 46 (suppl 9): 21-33, 2005
- McCormick DA, Contreras D. On the cellular and network bases of epileptic seizures. *Annual Rev Physiol* 2001 63: 815-46
- Gloor P, Ball G, Schaul N. Brain lesions that produce delta waves in the EEG *Neurology* 1977 27: 326-33
- Amzica F. Physiology of sleep and wakefulness as it relates to the physiology of epilepsy. *Journal of Clinical Neurophysiology* 2002; 19(6):488-503
- Stafstrom CE. The role of the subiculum in epilepsy and epileptogenesis. *Epilepsy Currents*. 2005; 5(4): 121-129.
  - **Comment:** *A very useful discussion of the anatomy – physiology of the mesial temporal lobe.*

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### EEG CLINICAL

#### REVIEW PAPERS

- Mendez, OE, Brenner RP. Increasing the yield of EEG. J Clin Neurophysiol. 2006; 23(4): 282-293
- Blume, WT. Drug effects on EEG. J Clin Neurophysiol 2006; 23(4): 306-311
- Hrachovy, RA, Frost James D. Jr. The EEG in selected generalized seizures. J Clin Neurophysiol. 2006; 23(4):312-332.
- Verma A, Radtke R. EEG of Partial Seizures. J Clin Neurophysiol. 2006; 23(4):333-339.
- Olejnicz P. Neurophysiologic basis of EEG. J Clin Neurophysiol. 2006;23(3):186-189.
- Tatum, WO, Husain AM, Benbadis, SR., Kaplan PW. Normal Adult EEG and patterns of uncertain significance. J Clin Neurophysiol 2006; 24 (3): 194-207.
- Santoshkumar B, Chong JJ, Blume WT, McLachlan RS, Young GB, Diosy DC, Burneo JG, Mirsattari SM. Prevalence of benign epileptiform variants. Clin Neurophysiol 2009; 120(5):856-61
- Punia, Vineet et al. Electrographic and clinical natural history of lateralized periodic discharges. J Clin Neurophysiol 35: 71-76, 2018
- Husain, Aatif M. Electroencephalographic Assessment of Coma. J Clin Neurophysiol. 2006; 23(3): 208-220.
- Kaplan PW. The EEG in metabolic encephalopathy and coma. J Clin Neurophysiol 2004; 21(5):307-318.
- Young, GB. The EEG in Coma. J Clin Neurophysiol. 2000; 17(5):473-485.
- Kaplan, Peter W. The EEG of Status Epilepticus. J Clin Neurophysiol 2004; 21 (5): 307-318.
- Brenner, Richard P. EEG in Convulsive and Nonconvulsive Status Epilepticus. J Clin Neurophysiol 2004; 21 (5): 319-331.
- Hirsch LJ, et al. American Clinical Neurophysiology Society's Standardized Critical Care EEG Terminology: 2012 version. J Clin Neurophysiol 2013; 30:1-27
  - **Comment:** This review gives a new nomenclature of ICU EEG patterns, the old terms are still useful for many EEGers and will be accepted for the EEG exam.
- McCoy B, Hahn CD. Continuous EEG Monitoring in the Neonatal Intensive Care Unit. J Clin Neurophysiol 2013; 30: 106-114.

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- Ohtahara,S, Yamatogi Y. Encephalopathies in early infancy with suppression• burst. J Clin Neurophysiol. 2003; 20(6):398-407.
- Markand ON. Lennox-Gastaut syndrome (childhood epileptic encephalopathy). Journal of Clinical Neurophysiology 2003; 20(6):426-441.
- Hrachovy RA, Frost, James D. Jr Infantile epileptic encephalopathy with hypsarrhythmia (infantile spasms/West syndrome). J Clin Neurophysiol 2003; 20(6):408-42
- Yamatogi Y, Ohtahara S. Severe epilepsy with multiple independent spike foci. J Clin Neurophysiol 2003; 20 (6):442-448.
- Guerrini R; Aicardi J. Encephalopathies with myoclonic seizures in infants and children (severe myoclonic epilepsy and myoclonic-astatic epilepsy). J Clin Neurophysiol 2003; 20(6): 462-472.
- Smith, MC, Hoepfner, T J. Epileptic encephalopathy of late childhood: Landau-Kleffner Syndrome and the syndrome of continuous spikes and waves during slow-wave sleep. J Clin Neurophysiol 2003; 20(6): 462-472.
- Brenner, RP. Electroencephalography in syncope. J Clin Neurophysiol 1997; 14(3): 197-209.
- Jankel WR, Niedermeyer E. Sleep spindles. J Clin Neurophysiol 1985; 1(1):1-35.

## EEG REFERENCE TEXTBOOKS

- Fisch and Spehlmann's EEG Primer: Basic Principles of Digital and Analog EEG. Bruce Fisch. Elsevier. 2009.
  - **Comment:** very easy to read, succinct text.
- Ebersole JS, Pedley TA. Current Practice of Clinical Electroencephalography. Third Edition. Lippincott, Williams, and Wilkins. 2002
- Shomer DL and Lopes da Silva F. Niedermeyer's Electroencephalography: Basic Principles, Clinical Applications, and Related Fields. Lippincott, Williams, and Wilkins. Jan 2018

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### EEG ATLASES

**Comment:** These volumes should be used by candidates to enhance EEG pattern recognition skills.

- Atlas of Adult Electroencephalography, 2<sup>nd</sup> Edition Blume WT, Kaibara M, Young GB 2001. Lippincott Williams & Wilkins.
- Atlas of Pediatric EEG, Laoprasert P, 2011. McGraw-Hill Medical.
- Atlas of Pediatric Electroencephalography, 2<sup>nd</sup> Edition Blume WT, Kaibara M. Lippincott, Williams and Wilkins.
- Stern JM, Engel J Jr. Atlas of EEG Patterns. Lippincott Williams and Wilkins. 2005
- Abon-Khalil B, Misulis KE. Atlas of EEG and Seizure Semiology. Butterworth Heinemann. 2006
- Kellaway P, Mizrahi E, Hrachovy R. Atlas of Neonatal Electroencephalography. 3<sup>rd</sup> Edition. Lippincott, Williams, and Wilkins. 2003