

Original article

Approaches to staging sleep in polysomnographic studies with epileptic activity

Mary L. Marzec, Beth A. Malow^{*}

Michael S. Aldrich Sleep Disorders Laboratory and the Epilepsy Program, Clinical Neurophysiology Section, Department of Neurology, University of Michigan Medical School, UH Room 8D-8702, 1500 East Medical Center Drive, Ann Arbor, MI 48109-0117, USA

Received 21 August 2002; received in revised form 8 November 2002; accepted 11 November 2002

Abstract

Background: The Standardized Sleep Manual of Rechtschaffen and Kales is well established and reliable in scoring the majority of polysomnograms (PSGs) encountered in clinical practice. In patients with epilepsy, however, abnormal brain activity may confound the interpretation of sleep waveforms. Our goal is to identify features that are problematic in analyzing sleep stages in patients with epilepsy and to offer approaches to score these PSGs.

Methods: Ninety-eight PSGs from 43 patients with epilepsy were scored using Rechtschaffen and Kales guidelines. Features interfering with sleep staging were noted.

Results: In scoring polysomnograms (PSGs) of patients with epilepsy we noted epileptic seizures, interictal epileptiform discharges (IEDs) and abnormal EEG background to be features of epilepsy that compromised sleep scoring. Overall, 48% of the studies in our sample contained one or more of these epileptic features to the extent that sleep scoring by standard criteria was compromised. Approaches for staging sleep in the setting of these abnormalities are outlined.

Conclusions: The Rechtschaffen and Kales method of sleep scoring is useful in staging the majority of PSGs of patients with epilepsy. However, we advocate some modifications because the abnormal electrical activity of epilepsy may interfere with accurate scoring of sleep waveforms. These approaches to scoring PSGs of patients with epilepsy will require empirical testing.

© 2003 Elsevier B.V. All rights reserved.

Keywords: Sleep scoring; Rechtschaffen and Kales; Epilepsy; Seizure; Interictal epileptiform discharge

1. Introduction

A relationship between sleep and epileptic activity has been noted and appreciated by scientists for centuries. Hippocrates and Aristotle made observations that seizures are associated with sleep or sleepiness in some patients [1,2]. Yet, over 2000 years later, scientists are still exploring interrelationships between epileptic seizures, sleep, and electroencephalographic (EEG) measures of brain activity. Polysomnography (PSGs) has been widely used to investigate this interrelationship [3–6].

Especially when combined with multiple EEG channels, PSGs are also a useful clinical diagnostic tool for physicians

in their treatment of patients with epilepsy. These studies may distinguish seizures from other sleep-related events, such as arousal disorders, and may diagnose sleep disorders co-existing with epilepsy. Other areas of research in epilepsy concern the influence of sleep state, circadian rhythms, and brain activity during individual stages of sleep on seizure initiation [7].

Increased study of sleep EEGs in patients with epilepsy has been facilitated by the progression from paper to digital recordings. Parameters that were ‘fixed’ on paper studies, such as the montage, filter settings, and paper speed can now be changed on the digital recording to customize analyses for both EEG and sleep. This technological advancement has resulted in the increased clinical and research use of sleep EEG and PSG studies. Despite these technical advances and the growing interest in the relation between sleep and epilepsy, there are no specific guidelines for staging sleep records where epilepsy is suspected or known

^{*} Corresponding author. Present address: Department of Neurology, Vanderbilt University Medical Center, 2100 Pierce Avenue, 320 MCS, Nashville, TN 37212-3373, USA. Tel.: +1-615-936-2287; fax: +1-615-936-2996.

E-mail address: Beth.malow@vanderbilt.edu (B.A. Malow).

Sleep 1976 Memory Environment Epilepsy Sleep Staging

Sabine Zange



Sleep 1976 Memory Environment Epilepsy Sleep Staging:

This is likewise one of the factors by obtaining the soft documents of this **Sleep 1976 Memory Environment Epilepsy Sleep Staging** by online. You might not require more epoch to spend to go to the books commencement as without difficulty as search for them. In some cases, you likewise pull off not discover the publication Sleep 1976 Memory Environment Epilepsy Sleep Staging that you are looking for. It will agreed squander the time.

However below, in imitation of you visit this web page, it will be appropriately certainly simple to get as well as download guide Sleep 1976 Memory Environment Epilepsy Sleep Staging

It will not consent many mature as we notify before. You can get it even if bill something else at house and even in your workplace. appropriately easy! So, are you question? Just exercise just what we have the funds for under as well as review **Sleep 1976 Memory Environment Epilepsy Sleep Staging** what you similar to to read!

<https://archive.kdd.org/book/publication/Documents/Subject%20Structure%20An%20Anthology%20For%20Wri.pdf>

Table of Contents Sleep 1976 Memory Environment Epilepsy Sleep Staging

1. Understanding the eBook Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - The Rise of Digital Reading Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - Advantages of eBooks Over Traditional Books
2. Identifying Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - User-Friendly Interface
4. Exploring eBook Recommendations from Sleep 1976 Memory Environment Epilepsy Sleep Staging

- Personalized Recommendations
- Sleep 1976 Memory Environment Epilepsy Sleep Staging User Reviews and Ratings
- Sleep 1976 Memory Environment Epilepsy Sleep Staging and Bestseller Lists
- 5. Accessing Sleep 1976 Memory Environment Epilepsy Sleep Staging Free and Paid eBooks
 - Sleep 1976 Memory Environment Epilepsy Sleep Staging Public Domain eBooks
 - Sleep 1976 Memory Environment Epilepsy Sleep Staging eBook Subscription Services
 - Sleep 1976 Memory Environment Epilepsy Sleep Staging Budget-Friendly Options
- 6. Navigating Sleep 1976 Memory Environment Epilepsy Sleep Staging eBook Formats
 - ePub, PDF, MOBI, and More
 - Sleep 1976 Memory Environment Epilepsy Sleep Staging Compatibility with Devices
 - Sleep 1976 Memory Environment Epilepsy Sleep Staging Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - Highlighting and Note-Taking Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - Interactive Elements Sleep 1976 Memory Environment Epilepsy Sleep Staging
- 8. Staying Engaged with Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Sleep 1976 Memory Environment Epilepsy Sleep Staging
- 9. Balancing eBooks and Physical Books Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Sleep 1976 Memory Environment Epilepsy Sleep Staging
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - Setting Reading Goals Sleep 1976 Memory Environment Epilepsy Sleep Staging
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Sleep 1976 Memory Environment Epilepsy Sleep Staging

- Fact-Checking eBook Content of Sleep 1976 Memory Environment Epilepsy Sleep Staging
- Distinguishing Credible Sources

13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
- Exploring Educational eBooks

14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

Sleep 1976 Memory Environment Epilepsy Sleep Staging Introduction

Free PDF Books and Manuals for Download: Unlocking Knowledge at Your Fingertips In today's fast-paced digital age, obtaining valuable knowledge has become easier than ever. Thanks to the internet, a vast array of books and manuals are now available for free download in PDF format. Whether you are a student, professional, or simply an avid reader, this treasure trove of downloadable resources offers a wealth of information, conveniently accessible anytime, anywhere. The advent of online libraries and platforms dedicated to sharing knowledge has revolutionized the way we consume information. No longer confined to physical libraries or bookstores, readers can now access an extensive collection of digital books and manuals with just a few clicks. These resources, available in PDF, Microsoft Word, and PowerPoint formats, cater to a wide range of interests, including literature, technology, science, history, and much more. One notable platform where you can explore and download free Sleep 1976 Memory Environment Epilepsy Sleep Staging PDF books and manuals is the internet's largest free library. Hosted online, this catalog compiles a vast assortment of documents, making it a veritable goldmine of knowledge. With its easy-to-use website interface and customizable PDF generator, this platform offers a user-friendly experience, allowing individuals to effortlessly navigate and access the information they seek. The availability of free PDF books and manuals on this platform demonstrates its commitment to democratizing education and empowering individuals with the tools needed to succeed in their chosen fields. It allows anyone, regardless of their background or financial limitations, to expand their horizons and gain insights from experts in various disciplines. One of the most significant advantages of downloading PDF books and manuals lies in their portability. Unlike physical copies, digital books can be stored and carried on a single device, such as a tablet or smartphone, saving valuable space and weight. This convenience makes it possible for readers to have their entire library at their fingertips, whether they are commuting, traveling, or simply enjoying a lazy afternoon at home. Additionally, digital files are easily searchable, enabling readers to locate specific information within seconds. With a few keystrokes, users can search for keywords, topics, or phrases, making research and

finding relevant information a breeze. This efficiency saves time and effort, streamlining the learning process and allowing individuals to focus on extracting the information they need. Furthermore, the availability of free PDF books and manuals fosters a culture of continuous learning. By removing financial barriers, more people can access educational resources and pursue lifelong learning, contributing to personal growth and professional development. This democratization of knowledge promotes intellectual curiosity and empowers individuals to become lifelong learners, promoting progress and innovation in various fields. It is worth noting that while accessing free Sleep 1976 Memory Environment Epilepsy Sleep Staging PDF books and manuals is convenient and cost-effective, it is vital to respect copyright laws and intellectual property rights. Platforms offering free downloads often operate within legal boundaries, ensuring that the materials they provide are either in the public domain or authorized for distribution. By adhering to copyright laws, users can enjoy the benefits of free access to knowledge while supporting the authors and publishers who make these resources available. In conclusion, the availability of Sleep 1976 Memory Environment Epilepsy Sleep Staging free PDF books and manuals for download has revolutionized the way we access and consume knowledge. With just a few clicks, individuals can explore a vast collection of resources across different disciplines, all free of charge. This accessibility empowers individuals to become lifelong learners, contributing to personal growth, professional development, and the advancement of society as a whole. So why not unlock a world of knowledge today? Start exploring the vast sea of free PDF books and manuals waiting to be discovered right at your fingertips.

FAQs About Sleep 1976 Memory Environment Epilepsy Sleep Staging Books

How do I know which eBook platform is the best for me? Finding the best eBook platform depends on your reading preferences and device compatibility. Research different platforms, read user reviews, and explore their features before making a choice. Are free eBooks of good quality? Yes, many reputable platforms offer high-quality free eBooks, including classics and public domain works. However, make sure to verify the source to ensure the eBook credibility. Can I read eBooks without an eReader? Absolutely! Most eBook platforms offer web-based readers or mobile apps that allow you to read eBooks on your computer, tablet, or smartphone. How do I avoid digital eye strain while reading eBooks? To prevent digital eye strain, take regular breaks, adjust the font size and background color, and ensure proper lighting while reading eBooks. What the advantage of interactive eBooks? Interactive eBooks incorporate multimedia elements, quizzes, and activities, enhancing the reader engagement and providing a more immersive learning experience. Sleep 1976 Memory Environment Epilepsy Sleep Staging is one of the best book in our library for free trial. We provide copy of Sleep 1976 Memory Environment Epilepsy Sleep Staging in digital format, so the resources that you find are reliable. There are also many Ebooks

of related with Sleep 1976 Memory Environment Epilepsy Sleep Staging. Where to download Sleep 1976 Memory Environment Epilepsy Sleep Staging online for free? Are you looking for Sleep 1976 Memory Environment Epilepsy Sleep Staging PDF? This is definitely going to save you time and cash in something you should think about.

Find Sleep 1976 Memory Environment Epilepsy Sleep Staging :

subject structure an anthology for wri

succeeding sane making room for joy in a crazy world

successful management of new products

success with online retailing for small businesses

style in pottery

style manual for authors editors and printers

subordin author early modern ecb

stuttering therapy

success of hispanic magazine a publishing success story success ser.

stump a campaign journal

stumbling on god

successful school a framework for creativity quality and effectiveness

suddenly silver celebrating 25 years of for better or for worse

suburban sage short story index reprint ser.

subversive orthodoxy traditional faith and radical commitment

Sleep 1976 Memory Environment Epilepsy Sleep Staging :

8 Creative Activities to Teach The Giver (by Lois Lowry) 1. The Ceremony of 12 Simulation · 2. Seeing Beyond Activity · 3. Memory Transmission Activity · 4. The House of Old Activity · 5. Dream Sharing Activity · 6. A ... The giver chapter activities The Giver novel study unit for the book by Lois Lowry. Includes the Giver chapter quizzes, chapter question sets for all 23 chapters, ... 5 Engaging Activities to Teach The Giver Jun 30, 2021 — 5 Engaging Activities to Teach The Giver · 1. PRE-READING LEARNING STATIONS · 2. MOCK CEREMONY OF 12 · 3. QUESTION TRAIL · 4. ACTING OUT CHAPTER 19. The Giver: 7 Creative Classroom Activities Jan 30, 2014 — Hang sheets of different colored paper around the room, with a notepad next to each color. Have students spend 30 seconds at each color, writing ... The giver activities The Giver Novel

Study - Comprehension Questions - Activities - Final Projects ... Chapter Activities. Created by. The Inclusive Mrs C. The Giver by Lois Lowry This unit has been designed to develop students' reading, writing, thinking, listening and speaking skills through exercises and activities related to The Giver ... The Giver Lesson Plans - Lesson Plans and Ideas for ... Below are 10 quick lesson plan ideas for teaching The Giver by Lois Lowry. If you want detailed daily lesson plans and everything else you need to teach The ... The Giver ... chapters of The Giver and is comprised of five of the following different activities: Before You Read; Vocabulary Building; Comprehension Questions; Language ... The Giver Teaching Ideas Nov 21, 2016 — Check out these The Giver teaching ideas to make your novel study fun and exciting. Your middle schoolers will thank you. Introductory Activities - The Giver by Lois Lowry - Weebly An anticipation guide is a comprehension strategy that is used before reading to activate students' prior knowledge and build curiosity about a new topic. B-APT Form D Aptitude Test It is a work sample test in which the examinee writes coded instructions to a "computer" in a logical sequence to carry out program specifications. The ... Company wants me to take a test called the "Berger ... The idea behind the test is to evaluate the logic and reasoning abilities of the person taking it to see if they're worth training as a ... B-APT Advanced Form Aptitude Test 25 Test Questions. 2 hours to administer. Scored at Psychometrics. The B-APT AF is an advanced form of the B-APT, covering basic ... What questions are asked in Berger Paints TSTO written test? Jan 16, 2018 — In quantitative aptitude section , major questions were on areas, ages , ratio and proportion, compound interest, linear equation problems, ... Practice for Your Roland Berger Korn Ferry Assessment Test These tests evaluate one's behavioural competencies, experiences, personality traits, and motivators. Korn Ferry provides a number of different aptitude tests ... How to Ace the Roland Berger Analytical Test The sample test contains questions that test a candidate's ability to interpret data presented in multiple formats such as qualitative, quantitative, or ... Roland Berger Analytical Test: How to crack the RB ... - YouTube Anybody ever take the Berger Aptitude Test? Jul 11, 2007 — It's supposedly a test given to prospective computer programmers to see if they have any potential (presumably it checks that they have basic ... Berger Paints Nigeria Plc Aptitude Test Questions Berger Paints Nigeria Plc Aptitude Test Past Questions and Answers. We have collated various aptitude test past questions and answers in our database. Payroll Accounting 2014 (with Computerized ... Amazon.com: Payroll Accounting 2014 (with Computerized Payroll Accounting Software CD-ROM): 9781285437064: Bieg, Bernard J., Toland, Judith: Books. CengageNOW for Bieg/Toland's Payroll Accounting 2014 ... CengageNOW for Bieg/Toland's Payroll Accounting 2014, 24th Edition ; Sold by. Amazon.com Services LLC ; Payment. Secure transaction ; Language: English ; Date First ... Payroll Accounting 2014 (with Computerized ... Bieg, Bernard J.; Toland, Judith ... Prepare for career success with first-hand experience in calculating payroll, completing payroll taxes, and preparing payroll ... Payroll Accounting 2014 CH 3-Bieg- Toland Flashcards This form shows the total FICA wages paid and the total FICA taxes both employee and employer contributions and the federal income taxes withheld. Payroll Accounting book by Bernard J. Bieg This number-one selling Payroll Accounting text/workbook illustrates the

calculation of payroll, payroll taxes, and the preparation of records and reports ... Payroll Accounting 2014 - Bernard Bieg, Judith Toland Nov 1, 2013 — Gain the first-hand experience and complete background you need for success in calculating payroll, completing payroll taxes, and preparing ... PAYROLL ACCOUNTING 2014 By Bernard J Bieg PAYROLL ACCOUNTING 2014 By Bernard J Bieg. ~ Quick Free Delivery in 2-14 days. 100 ... Toland. Publisher. Course Technology. Genre. Business & Economics. Topic. Payroll Accounting 2014 (with Computerized ... The 2014 edition of Bieg/Toland's market-leading text addresses all of the latest laws on payroll. The text focuses on applications rather than theory, and ... Chapter 6 Exam - 2014 PAYROLL ACCOUNTING edition... View Test prep - Chapter 6 Exam from BBA 1233 at Kasetsart University. 2014 PAYROLL ACCOUNTING edition Bieg/Toland Section ADIRECTIONS: Each of the ... Payroll Accounting 2024, 34th Edition - 9780357901052 Introduce your students to the concepts and skills needed to understand and calculate payroll, complete payroll taxes and prepare payroll records and reports ...