

Pass The Un-passable

DABNM CRASH COURSE



<http://intraoperativeneuromonitoring.com>

What this course is NOT...

- **A review of the literature**
- **Resource list**
- **Canned answers**
- **Prewritten case notes**
- **The questions I was asked**



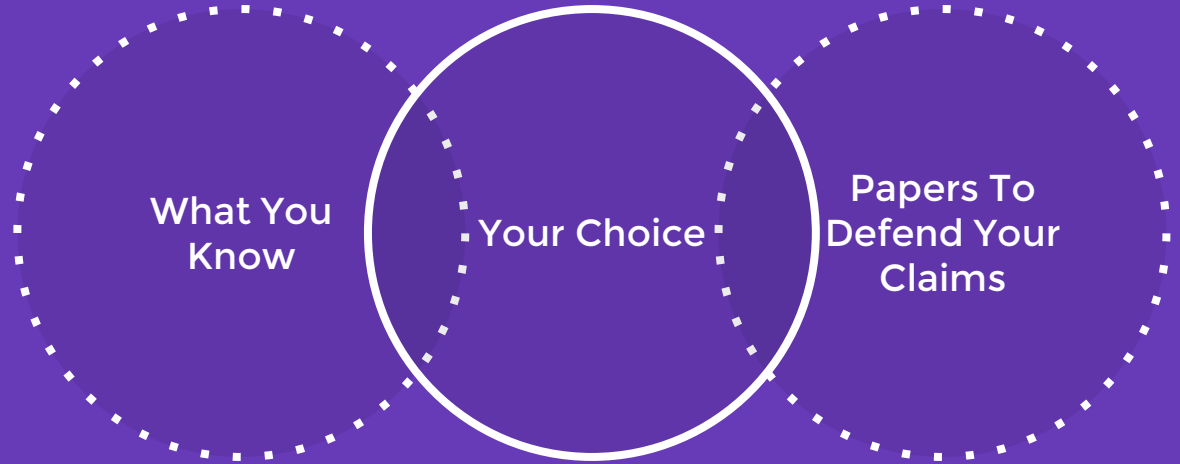
1.

**Case
Selection**

**Just a piece
of advice**



**Give
Yourself
More
Than A
Punchers
Chance**



Pick 2.

Choose Wisely.

I. Spine

- A Scoliosis
- B Thoracic Stabilization
- C Lumbosacral Pedicle Screw Fusion
- D Cervical Fusion
- E Spinal Cord Tumor
- F Tethered Cord

II. Vascular

- A Carotid Endarterectomy
- B Intracranial Aneurysm
- C Thoraco-Abdominal Aortic Aneurysm

III. Intracranial

- A CP Angle/Post Fossa Tumor
- B Large Skull Base Tumor
- C Pituitary Tumor
- D Intracranial Lesion/Tumor
Micro-Vascular
- E Decompression of a Cranial Nerve

IV. Intraoperative Diagnostics

- Brachial
- A Plexus/Peripheral Nerve
- B Epilepsy
Electrocorticography
- C Functional
Neurosurgery

2.

Case Submission

Don't Fail The Test
Before You Even Walk
Through The Door!



FORCE

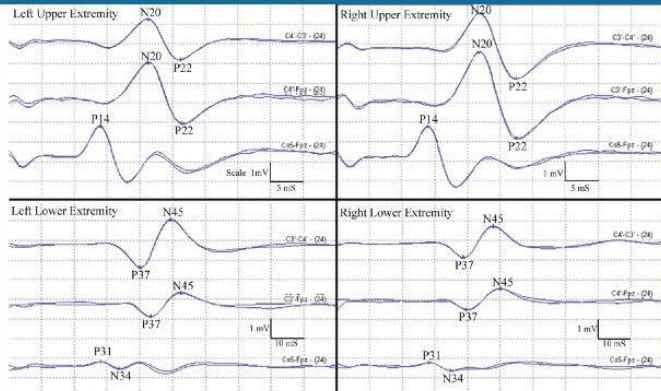
THEIR HAND

One way: You would be very smart to hand in a bulletproof case. Force them to come up with “what if” scenarios.

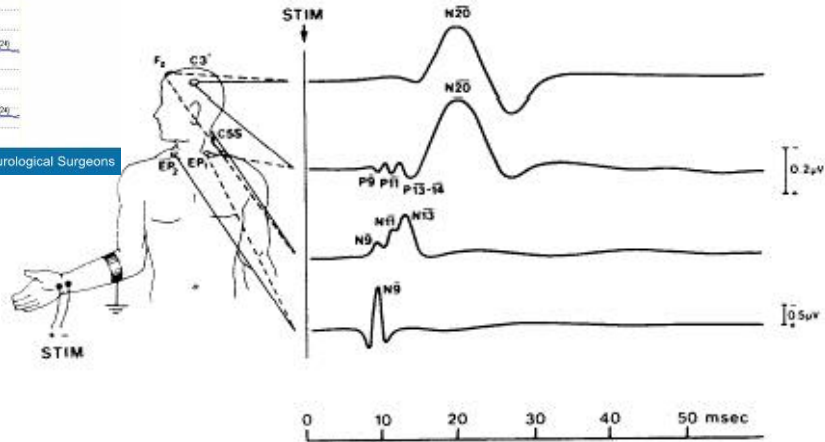
Another way: If there are weaknesses, find them and rehearse your defense.

Which Case To Use?

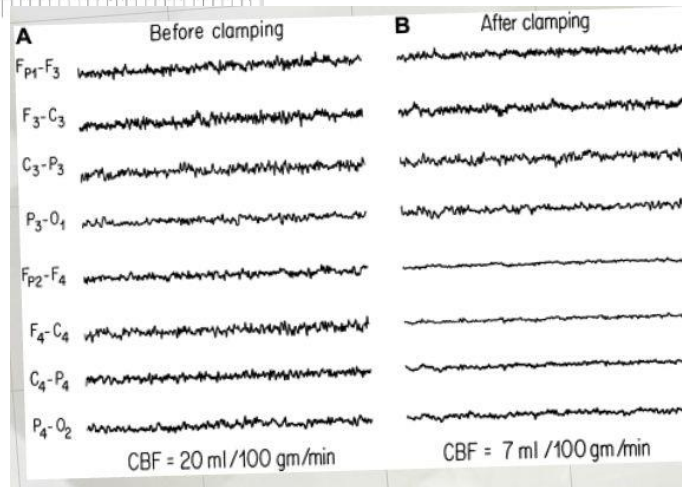
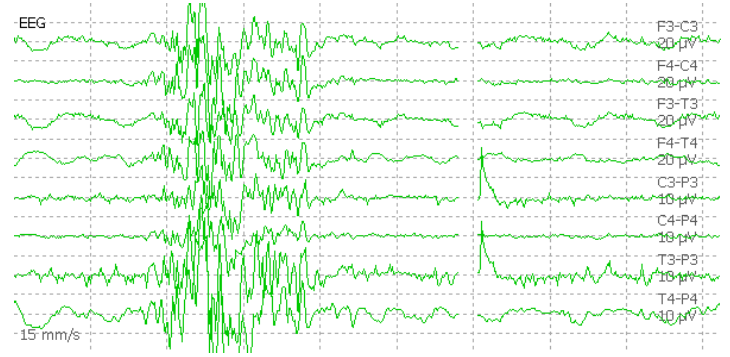
Medscape



Source: Neurosurg Focus © 2009 American Association of Neurological Surgeons



Which Change To Use?



Do A Complete WHY Check...



What is the single worst answer you can give?

Procedure Setup - SST_32_Spine Tumor_Joe - D-wave, SSEP, MEP, S EMG, T EMG, RLN, TOF.smp

File Test

Channels

Test: SSEP / MEP / S EMG Test Setup

CADVELL Cascade IOM

Mode: L UE SSEP | R UE SSEP | L LE SSEP | R LE SSEP | L MEP | R MEP | D-wave | Free run EMG | T EMG | LE TOF | DC Mapping

Mode Channels

Amp Chn	Name	Invert	Amp Chn	Name	Invert
27: EPD...	EPD1 (s...	<input type="checkbox"/>			<input type="checkbox"/>
28: EPD...	EPD1 (s...	<input type="checkbox"/>			<input type="checkbox"/>
29: EPD...	EPD2 (s...	<input type="checkbox"/>			<input type="checkbox"/>
30: EPD...	EPD2 (i...	<input type="checkbox"/>			<input type="checkbox"/>
31: EPD...	EPD1 (i...	<input type="checkbox"/>			<input type="checkbox"/>
32: EPD...	EPD2 (i...	<input type="checkbox"/>			<input type="checkbox"/>

Mode Settings

Acquisition
 Mode Type: MEP
 Acquisition Sweep (ms/Div): 2
 Sweep Delay (Div): 0
 Autostore
 Digital Filter: None

Stimulator
 Stim Type: TCS
 Label: Channel: 1
 Double Train: Off
 ITI: n/a
 Pulse Width: 75 µS
 Train Length: 1
 Type: TCS
 Setup Stimulator

EMG
 Remove Stim Artifact from EMG
 Duration (ms): 5

Setup
 Setup Trace Labels
 Setup Cursor Table
 Setup Reject Info

Views: SSEP / EMG | MEP / EMG / ...
 Available Windows:
 Mode Controls
 DC Mapping Below T1: 3D Tr
 DC Mapping Below T1: Averz
 DC Mapping Below T1: Cursc
 DC Mapping Below T1: EP Ar
 DC Mapping Below T1: Summ
 DC Mapping Below T1: Wate
 D-wave: 3D Trend

Channel Setup

Other Setup
 System Type: Elite / Pro 32
 Rep Rate Mode:
 Manual
 Auto

Buttons: Add Mode, Remove Mode, Rename Mode, Edit Groups, Timer Intervals, Edit Events, Print Procedure Setup, OK, Cancel





Give Them Data. Don't Give Them A Reason To Doubt You.

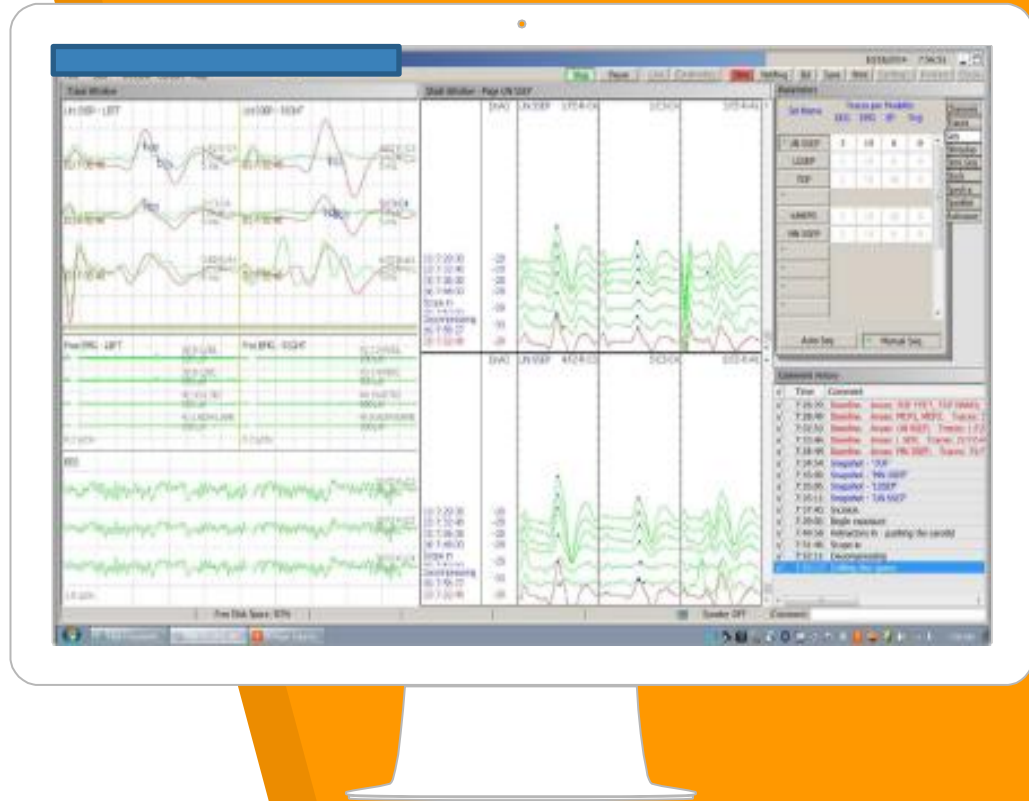
- ▶ Intro
- ▶ Snapshots for every update of live traces (10-15 min, more if there's a problem)
- ▶ Snapshot for every triggered response
- ▶ Waterfall and/or summary
- ▶ Numeric Values/Tables (use markers)
- ▶ Comments on traces
- ▶ Remote oversight transcripts
- ▶ Case note

This is your opportunity to show them the high level of monitoring you're performing.



COMMENTS SUGGESTIONS

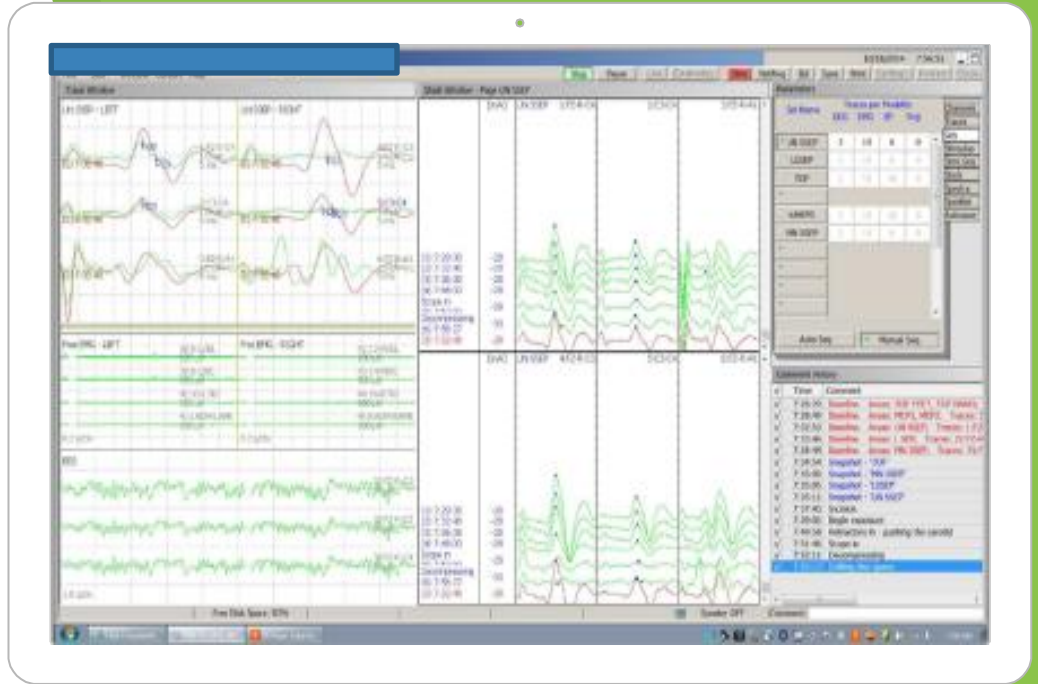
- ▶ Show diligent note taking that proves you had all appropriate conversations, can prove awareness of surgical procedure, anesthetic levels and your modalities.
- ▶ Document an appropriate history, review of pertinent diagnostic findings, patient complaints, etc.
- ▶ Make note on assessment of BSL and closing data
- ▶ Notes should be every 10-15 minutes
- ▶ Notes should be every time a conversation relative to the case happens





COMMENTS SUGGESTIONS

- ▶Notes should be every time the surgery moves to the next stage till the end (gross neuro exam)
- ▶Notes should be every time there's something noteworthy from a monitoring standpoint (a change, change in parameters, bad impedance, etc.)
- ▶Every 30 minutes do an anesthetic update
- ▶Every 30 minutes do a neuromonitoring update on all modalities watched that past 30 minutes
- ▶Make mapping comments as they happen along with triggered events.
- ▶Make a comment at the end of mapping.



Type of Surgery: Cauda Equina Surgery

Type of monitoring: Intraoperative monitoring using upper and lower extremity somatosensory evoked potentials (SSEP), motor evoked potentials (MEP), H-reflex, bulbocavernosus reflex (BCR), free-run electromyography (free-run EMG), triggered electromyography (tEMG) and train-of-four (TOF).

Setup: The neuromonitoring equipment met all regulatory biomechanical safety inspections. Placement of all

of monitoring this procedure was as follows: The patient's skin was prepped with methyl alcohol and disposable electrodes secured with tape on the body and head according to the International 10-10 system. For SSEP, perineal stimulation of the ulnar nerves (C7) and posterior tibial nerves (S1) using needle electrodes were placed at the wrist and ankle. Monophasic, rectangular pulses were delivered by a constant current stimulator. For UV SSEP, three channels of recording electrodes for each arm were placed 1) C25 referenced to Fpz for C7 (C25-C7) 2) contralateral cortical channel (CP3 and CP4) referenced to Fpz 3) a contralateral cortical channel of CP3-CP4 or CP4-CP3 with a contralateral active electrode. For F11, SSEP, four channels of recording electrodes for each leg were placed 1) Fpz referenced to C25 for a subcortical waveform 2) C25 referenced to Fpz for a cortical waveform and 3) a cortical to cortical channel of CP3-CP4 or CP4-CP3 with an ipsilateral active electrode 4) ipsilateral cortical channel (CP3 and CP4) referenced to Fpz. A ground electrode was placed in the shoulder and thigh. For MEPs, mini-neurostimulator using needle electrodes were placed 1) anterior to C3 and C4 of the International 10-20 System. For stimulation, the anode was contralateral to the recording site for muscles of the upper and lower extremities. Compound muscle action potentials (CMAPs) were recorded from the first dorsal web space (abductor pollicis longus, extensor pollicis longus, and abductor hallucis brevis) of the foot. For H-reflex, stimulation of the posterior tibial nerve using needle electrodes placed in the popliteal fossa. A monophasic, rectangular pulse was delivered by a constant current stimulator. CMAPs were recorded using needle electrodes from the soleus. For BCR, a monophasic, rectangular pulse was delivered by surface electrodes placed at the clitoris and labia majora. CMAPs were recorded from both the left and right external anal hemisphincter. For free-run EMG and tEMG, electrical activities of muscles

trapezius, rectus abdominis, tibialis anterior, gastrocnemius, abductor hallucis and anal sphincter muscles. The activities from these muscles were displayed on video and auditory monitors for visual and acoustic recognition. TOF monitoring was conducted as an adjunct to anesthesiologist's own assessment of muscle relaxation and visual observation of movement of the extremities during SSEP stimulation. Four monophasic, rectangular pulses were delivered by a constant current stimulator at the ankle over the F11. CMAPs were recorded over the abductor pollicis longus of the left foot.

Baseline Assessment: An impedance check was performed prior to running baseline data. All electrodes were less than 1000 ohms. A bite block was appropriately placed by the anesthesiologist between the molars to prevent a bite injury. A TOF of 4/4 was recorded prior to incision to assist the anesthesiologist (CRNA) in determining the appropriate level of muscle relaxation. Preoperative baselines for SSEPs were taken in the prone position on the surgical table after induction. For SSEP a stimulus intensity approximately 2 times the motor threshold was used. In general, all waveforms displayed reasonably appropriate morphologies, and were reasonably well-formed and reliable. Intermittent artifacts were present and required aggressive filtering. For MEPs, a stimulating intensity was chosen to produce a CMAP with minimal lead. For BCR, a multipulsed, supramaximal stimulating intensity was chosen to produce a reasonably reliable CMAP. BCR were reproducible in both left and right external anal hemisphincters. For H-reflex, a submaximal stimulating

intensity was chosen to produce a maximal reflex response before or at the start of a muscle response. H-reflexes were reliable in both lower extremities.

Mapping Summary: The patient was positioned with a stereotaxic frame and a head fixation device. The head and neck were taken to a position that allowed all soft tissue and suction all fluids from around the point of stimulation during testing. The stimulation was performed at all threshold levels of the altered compound muscle action potentials in the activated muscles or given feedback of no response. If the stimulation site did not produce a compound muscle action potential, the stimulators were repositioned in subsequent thresholds.

Monitoring Summary: Alarm criteria for significant changes in UV and F11 SSEP was a greater than 30% and/or 100% decrease in latency. However, any persistent change in amplitude or latency would also be reported. There were no significant changes in the SSEP following the positioning of the patient or throughout the surgical procedure in bilateral upper and lower extremities. The alarm criterion for significant changes in MEP was the presence or absence (i.e. all-or-none) of the CMAPs. However, any persistent change in amplitude would also be reported. There were no significant changes in the MEP following the positioning of the patient throughout the surgical procedure in all extremities.

The alarm criteria for significant changes in H-reflexes was a greater than 90% in reduction in amplitude. There were no significant changes in the H-reflexes following the positioning of the patient or throughout the surgical procedure in bilateral upper and lower extremities. The alarm criterion for significant changes in BCR was the presence or absence (i.e. all-or-none) of the CMAPs. However, any persistent change in amplitude would also be reported. There were no significant changes in the BCR following the positioning of the patient throughout the surgical procedure in all extremities.

Free-run EMG was assessed throughout the case with alarms being in the absence of activity or "quiet." Significant activity that would be relevant to the surgeon was defined as 1) a burst of single, non-synchronous, asynchronous potentials which are often complex and polyphasic in nature. This activity is usually associated with direct nerve manipulation and 2) "trains" or periods of prolonged, multiple or repetitive, synchronously grouped motor unit discharges that last up to several minutes continuously related to sustained traction and compression, and believed to be of greater severity. Free-run EMG was monitored throughout the procedure and all tendons remained quiet at closing.

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3.

**Collecting
Study Material**

Experience.
Textbooks.
Conferences.
Articles.

How To Find Study Material

Position Papers



The screenshot shows the ASNM website's 'Position Statements' page. A red arrow points from the 'Position Statements' link in the navigation menu to the main content area. The main content area includes the ASNM logo, a navigation menu, and a section titled 'POSITION STATEMENTS' with social media sharing options and a 'Position Statement Project' section. The 'Position Statement Project' section contains text about the ASNM's mission and the development of Clinical Practice Guidelines and Position Statements. A 'Gold Sponsors' section features SSENTIENT Medical Monitoring + Diagnostics. A 'SIGN IN' section includes a login form with fields for Username and Password, a 'Remember Me' checkbox, and a 'Sign In' button. A 'CALENDAR' section lists upcoming events, including the 2016 SSET - Southern Society of Electroneurodiagnostic Technologists Annual Meeting and the 2017 Winter Symposium.

Disclaimer: These statements are based on information presented at scientific meetings, published in the current scientific and clinical literature, and presented in previously published guidelines and position statements of various clinical societies. These documents may not include all possible methodologies and interpretive criteria, nor are they intended to exclude any new alternatives. ASNM provides general information and education materials as a service in promotion of its nonprofit and tax-exempt status.

How To Find Study Material

Starting at the beginning

Principles of Neurophysiological Assessment, Mapping, and Monitoring

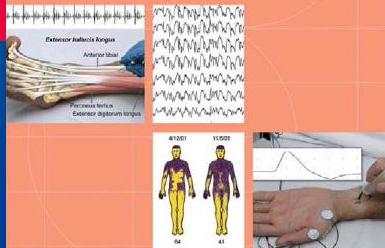
Alan David Kaye
Scott Francis Davis
Editors

Springer

CONTEMPORARY NEUROLOGY SERIES

CLINICAL NEUROPHYSIOLOGY

THIRD EDITION



JASPER R. DAUBE
DEVON I. RUBIN

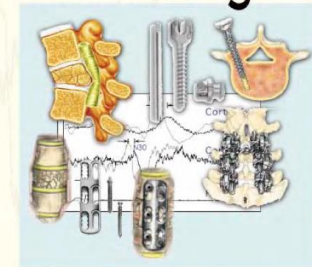
OXFORD

Aage R. Møller

Intraoperative Neurophysiological Monitoring

Third Edition

A CONCISE GUIDE TO Intraoperative Monitoring



GEORGE ZOURIDAKIS
ANDREW C. PAPANICOLAOU

How To Find Study Material

Start at the beginning

The screenshot shows an Amazon product page for the book "Principles of Neurophysiological Assessment, Mapping, and Monitoring" by Alan David Kaye. The page includes a navigation bar with various browser tabs, a search bar, and a list of related products. A red arrow points to the "Customers Who Bought This Item Also Bought" section.

Customers Who Bought This Item Also Bought

- This item: Principles of Neurophysiological Assessment, Mapping, and Monitoring by Alan David Kaye Paperback \$79.99
- Surgical Neurophysiology - 2nd Edition: A Reference Guide to Intraoperative Neurophysiological... by Faisal R. Jahangiri Paperback \$124.71
- Intraoperative Neuromonitoring by Christopher Loftus Hardcover \$141.04

Customers Who Bought This Item Also Bought

A row of book covers from the "Customers Who Bought This Item Also Bought" section. Each book is displayed with its cover image, title, author, and price. A red arrow points to the first book in the row.

Book Title	Author	Format	Price
Surgical Neurophysiology - 2nd Edition: A Reference Guide to Intraoperative...	Faisal R. Jahangiri MD	Paperback	\$124.71 ✓Prime
Intraoperative Neuromonitoring	Christopher Loftus	Hardcover	\$141.04 ✓Prime
A Practical Approach to Neurophysiologic Intraoperative Monitoring...	Aatif M. Husain MD	Paperback	\$79.32 ✓Prime
A Practical Approach to Neurophysiologic Intraoperative Monitoring	Aatif M. Husain MD	Paperback	\$75.15 ✓Prime
Monitoring the Nervous System for Anesthesiologists and...	Antoun Kohit	Paperback	\$89.99 ✓Prime
Intraoperative Neurophysiology : Interactive Case Studies	Alan D. Legatt MD PhD	DVD-ROM	\$100.72 ✓Prime
Handbook of EEG Interpretation, Second Edition	William Tatum IV DO	Paperback	\$54.27 ✓Prime
Intraoperative Neurophysiological Monitoring	Aage R. Møller	Hardcover	\$186.23 ✓Prime
Intraoperative Neurophysiology: A Comprehensive Guide to...	Mirela V. Simon MD	Hardcover	\$150.00 ✓Prime
A Concise Guide to Intraoperative Monitoring	George Zouridakis	Hardcover	\$144.36 ✓Prime

Customers Viewing This Page May Be Interested In These Sponsored Links (What's this?)

1. [Online EEG School](#) - Learn today. Earn tomorrow. Find out if a career in EEG is for you. (neurodiagnosti...)

Ad feedback

Editorial Reviews

Review

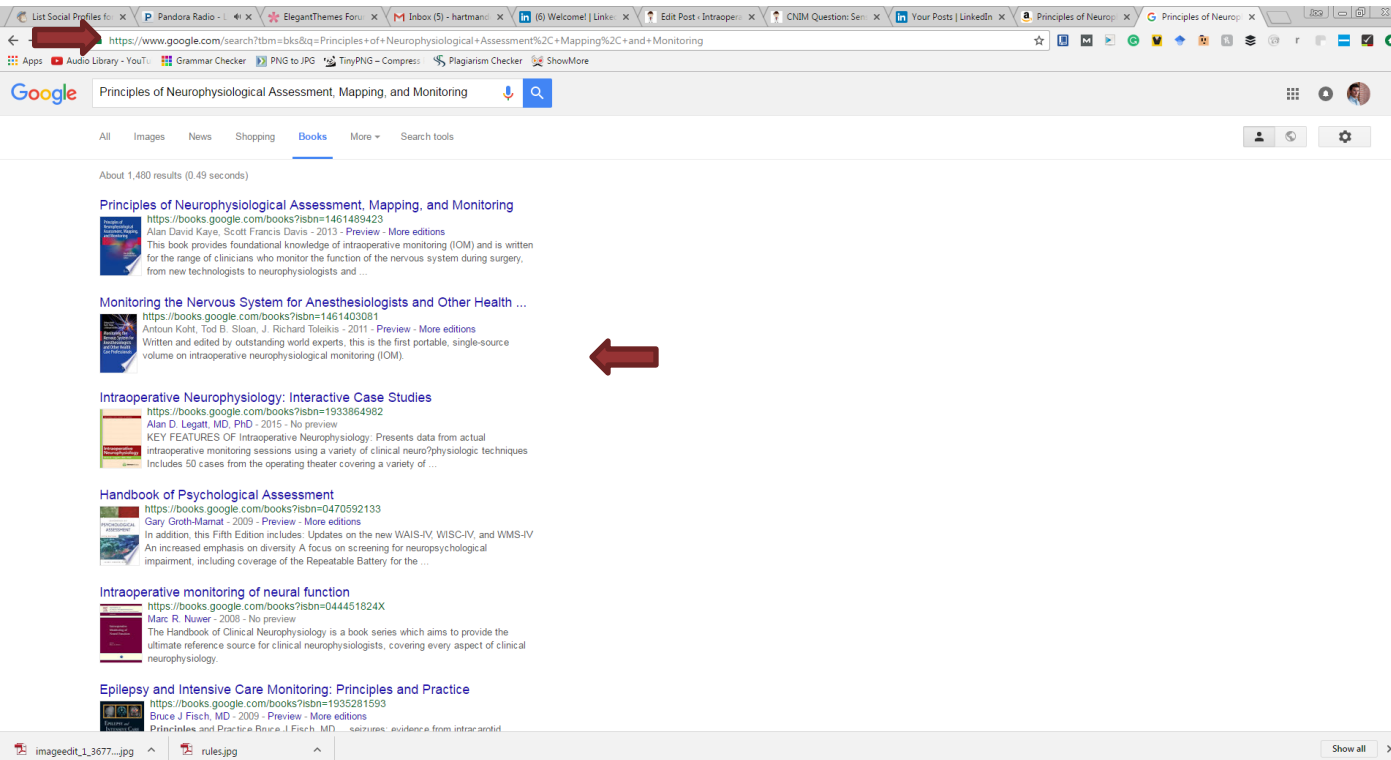
From the book reviews:

"This is an overview of the principles of neuromonitoring and the role it plays intraoperatively in different surgical procedures. ... The audience includes surgeons, neurologists, technicians, anesthesiologists, and even students, since it is easy to understand. ... It is brief and to the point, a small reference for students. This is a great read for neurophysiologists, anesthesiologists, and students who are interested in neurophysiology."

Show all

How To Find Study Material

Google Books for free content and leads to more articles or books



The screenshot shows a web browser window with multiple tabs. The active tab is a Google search for "Principles of Neurophysiological Assessment, Mapping, and Monitoring". The search results page displays a list of books. A red arrow points to the search bar, and another red arrow points to the second search result, "Monitoring the Nervous System for Anesthesiologists and Other Health ...".

Principles of Neurophysiological Assessment, Mapping, and Monitoring
<https://books.google.com/books?isbn=1461489423>
Alan David Kays, Scott Francis Davis - 2013 - Preview - More editions
This book provides foundational knowledge of intraoperative monitoring (IOM) and is written for the range of clinicians who monitor the function of the nervous system during surgery, from new technologists to neurophysiologists and ...

Monitoring the Nervous System for Anesthesiologists and Other Health ...
<https://books.google.com/books?isbn=1461403081>
Anton Kohl, Tod B. Sloan, J. Richard Tolekis - 2011 - Preview - More editions
Written and edited by outstanding world experts, this is the first portable, single-source volume on intraoperative neurophysiological monitoring (IOM).

Intraoperative Neurophysiology: Interactive Case Studies
<https://books.google.com/books?isbn=1933864982>
Alan D. Legatt, MD, PhD - 2015 - No preview
KEY FEATURES OF Intraoperative Neurophysiology: Presents data from actual intraoperative monitoring sessions using a variety of clinical neurophysiologic techniques. Includes 50 cases from the operating theater covering a variety of ...

Handbook of Psychological Assessment
<https://books.google.com/books?isbn=0470592133>
Gary Groth-Mamat - 2009 - Preview - More editions
In addition, this Fifth Edition includes: Updates on the new WAIS-IV, WISC-IV, and WMS-IV. An increased emphasis on diversity. A focus on screening for neuropsychological impairment, including coverage of the Repeatable Battery for the ...

Intraoperative monitoring of neural function
<https://books.google.com/books?isbn=044451824X>
Marc R. Nuwer - 2008 - No preview
The Handbook of Clinical Neurophysiology is a book series which aims to provide the ultimate reference source for clinical neurophysiologists, covering every aspect of clinical neurophysiology.

Epilepsy and Intensive Care Monitoring: Principles and Practice
<https://books.google.com/books?isbn=1935281593>
Bruce J Fisch, MD - 2009 - Preview - More editions
Principles and Practice Bruce J. Fisch, MD - seizures: evidence from intracarotid

How To Find Study Material

Google Books for free content and leads to more articles or books

The screenshot shows a Google search result for the book "Principles of Neurophysiological Assessment, Mapping, and Monitoring" by Alan David Kaye and Scott Francis Davis. The search results page includes a book cover, a price tag of \$24.36, and a "Get this book in print" button. The main content area displays the text of the book, with several words highlighted in yellow. A red arrow points to a "Selected References" section at the bottom of the page. The references list three sources: 1. Fortunato NH. Berry & Kohn's operating room technique. 9th ed. Mosby; St. Louis; 2000. 2. Turner S, Wicker P, Hind M. Principles of safe practice in the perioperative environment. In: Hind M, Wicker P, editors. Principles of perioperative practice. Edinburgh: Churchill Livingstone; 2000. p. 17-50. 3. Goldman M. Pocket guide to the operating room. 3rd ed. Philadelphia: F. A. Davis; 2007.

Result 4 of 43 in this book for **Principles of Neurophysiological Assessment, Mapping, and Monitoring** - [Previous](#) [Next](#) - [View all](#) [Clear search](#)

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Principles of Neurophysiological Assessment, Mapping, and Monitoring
edited by Alan David Kaye, Scott Francis Davis

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Each member of the team should understand their role and seek to carry that role out to the best of their ability, leaving behind any distractions or personal issues. The goal of each team member is to ensure a safe and effective surgical procedure. Achieving this goal requires proper communication and documentation. In order for the surgeon to concentrate on the procedure at hand, he or she must trust that the patient is being properly cared for and monitored by other members of the care team.

The neuromonitoring clinician must work with both the anesthesiologist and the surgeon to successfully accomplish the mission of monitoring the patient's nervous system during surgery. Information relayed from the neuron and anesthesiologist can change the course of the surgery and avoid a negative neurological outcome for the patient. Inaccurate information regarding neuromonitoring data can harm the patient either by failing to detect an emerging injury or by creating a necessary pause or stop to surgery based on a false alarm.

toring record, especially if the surgeon's requests are outside of commonly accepted monitoring protocols. Communication with the anesthesiologist prior to surgery is also essential. You should discuss the monitoring plan with the anesthesiologist including the effects of particular anesthetic regimens on the ability to collect monitoring data. At this time, contraindications to motor evoked potentials should be discussed as well as the location of all needle electrodes. If running motor evoked potentials, ask that the anesthesiologist place a soft bite block bilaterally. Document these communications thoroughly in the monitoring record.

Selected References

1. Fortunato NH. Berry & Kohn's operating room technique. 9th ed. Mosby; St. Louis; 2000.
2. Turner S, Wicker P, Hind M. Principles of safe practice in the perioperative environment. In: Hind M, Wicker P, editors. Principles of perioperative practice. Edinburgh: Churchill Livingstone; 2000. p. 17-50.
3. Goldman M. Pocket guide to the operating room. 3rd ed. Philadelphia: F. A. Davis; 2007.

How To Find Study Material

Google Images for free content and leads to more articles or books

The screenshot shows a Google search for "bulbocavernosus reflex". The search results are displayed in a grid format. The top row includes thumbnails for "Cremasteric Reflex", "Muscle", and "Female". Below these, there are several larger images and text snippets. One prominent image shows a diagram of the bulbocavernosus reflex arc, with a red arrow pointing to it. Another image shows a diagram of the spinal cord with a red arrow pointing to the sacral region. There are also several text-based snippets, including one titled "Bulbocavernosus Reflex" which describes the reflex as a test of the sacral spinal cord. Another snippet is titled "Physical Examination" and lists symptoms like "Sore and itchy" and "Motor strength and tone". A third snippet is titled "Bulbocavernosus Reflex" and describes the reflex as a test of the sacral spinal cord. A fourth snippet is titled "Social Reflexes" and shows a diagram of the reflex arc. A fifth snippet is titled "Palmar Nerve Stimulation" and shows a diagram of the reflex arc. A sixth snippet is titled "Bilateral Anal Sphincter Recording" and shows a diagram of the reflex arc. A seventh snippet is titled "Spinal shock" and shows a diagram of the spinal cord. A red arrow points to the "Spinal shock" snippet. The bottom of the screenshot shows the browser's address bar with the URL "https://www.google.com/search?q=bulbocavernosus+reflex&biw=1920&bih=901&source=Inms&tbm=isch&sa=X&sqi=2&ved=0ahUKewiDh-rFgcbPAiNvBiv4KHi3Bd8Q_AUIBygC" and the browser's search bar with the text "bulbocavernosus reflex".

How To Find Study Material

Conference lectures are a great resource for review of the literature, as well as what's new in the field.

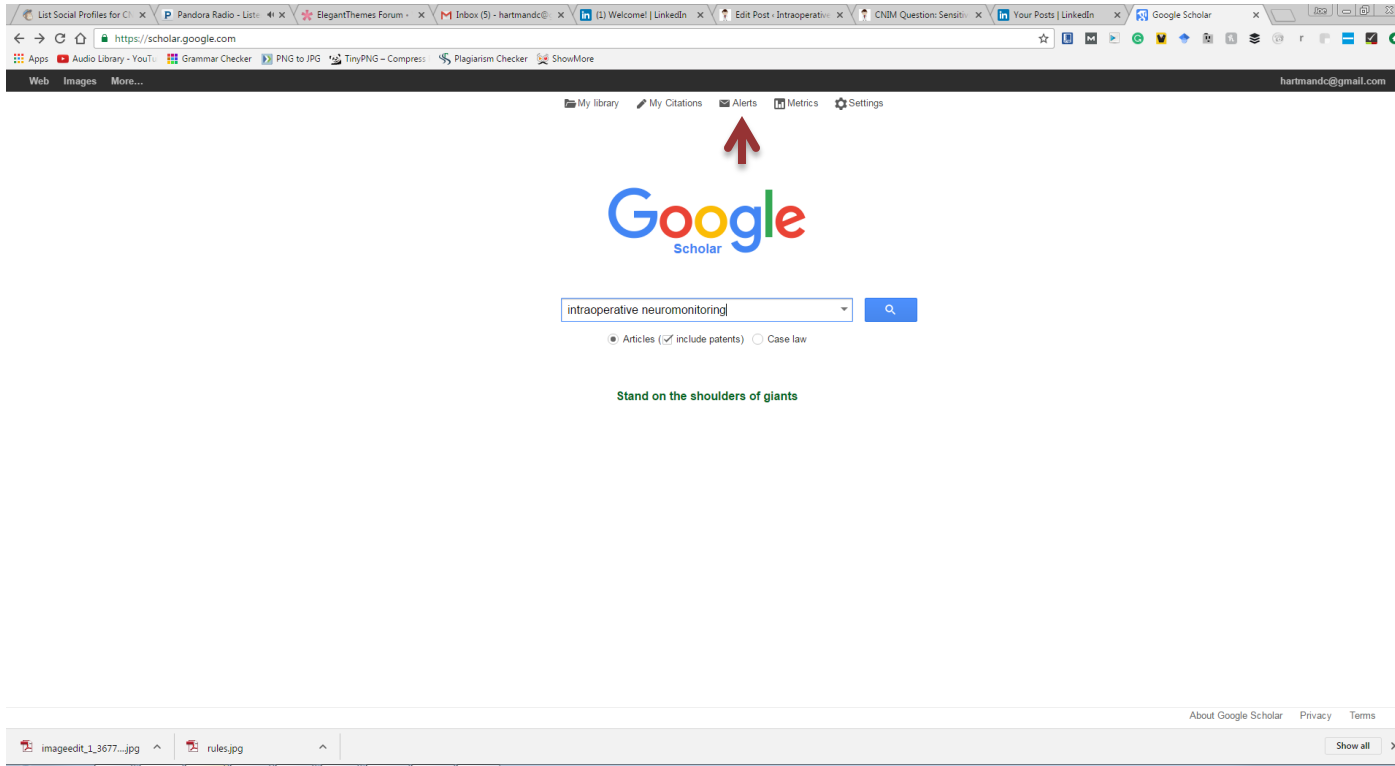


How To Find Study Material

Go back to Google with all your references. You can use the filetype: operator in Google Search to limit results to a specific file type.

- ▶ **Filetype:pdf**
- ▶ Filetype:ppt or Filetype:pptx
- ▶ Filetype:doc or Filetype:docx
- ▶ Filetype:txt
- ▷ Use these with general terms (“motor evoked potentials”)
- ▷ Use these with authors (JR Hartman)
- ▷ Use these with article titles (Intraoperative motor evoked potential monitoring – A position statement by the American Society of Neurophysiological Monitoring)

How To Find Articles!



The image shows a screenshot of a web browser displaying the Google Scholar homepage. The browser's address bar shows the URL <https://scholar.google.com>. The page features the Google Scholar logo, a search bar containing the text "intraoperative neuromonitoring", and a search button. Below the search bar, there are radio buttons for "Articles" (selected), "include patents", and "Case law". The text "Stand on the shoulders of giants" is visible below the search options. The browser's top navigation bar includes links for "My library", "My Citations", "Alerts", "Metrics", and "Settings". The browser's address bar also shows the email address "hartmandc@gmail.com".

My library My Citations Alerts Metrics Settings

Google Scholar

intraoperative neuromonitoring

Articles include patents Case law

Stand on the shoulders of giants

About Google Scholar Privacy Terms

imageedit_1_3677...jpg rules.jpg Show all

Use Youtube.com to learn about the surgery

Search: tethered cord surgery

left
superior
inferior
right

0:01 / 8:04

Tethered Spinal Cord Surgery
Coleman Clifford
7,569 views
Published on Aug 16, 2014

Up next

- Tethered Spinal Cord: Diagnosis and Treatment - Dr. David Memorial Hermann 9,428 views
- Cutting of tethered cord SpineandBrainCare 10,014 views
- Tethered Spinal Cord with Lipoma of the Filum Terminale Neurosurgen2010 15,643 views
- Tethered Cord Syndrome Explained Medical Course Abilashg Abiathar 13,837 views
- Medical Korea | World's first osteotomy for spine deformity medicalkorea 2,946,987 views
- Detethering of post MMC tethered cord Khalid Al-Kharazi 854 views
- Scoliosis Surgery - Posterior Spinal Instrumented Fusion, Shyam Kushan

Use Google Books to learn about the surgery

The image shows a Google search for "tethered cord surgery". The search results page lists several books, including "Minimally Invasive Relief", "Back Surgery Alternatives", "Spine Surgery", "Obstetric Anesthesia and Uncommon Disorders - Page 214", "Tethered Cord Syndrome in Children and Adults", "Nursing Care of the Pediatric Neurosurgery Patient - Page 105", and "Pediatric Physical Therapy - Page 268". A red arrow points to the search bar in the top left.

The detailed view of a book chapter is shown on the right. The book is "Samii's Essentials in Neurosurgery" edited by Ricardo Ramina, Paulo Henrique Pires, Aguiar, Marcos Tagatiba. The chapter is "24.8 Operative Technique and Intraoperative Monitoring". The text discusses the importance of pressure management and the surgical approach for tethered cord syndrome. A red arrow points to the chapter title.

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Samii's Essentials in Neurosurgery
edited by Ricardo Ramina, Paulo Henrique Pires, Aguiar, Marcos Tagatiba

tethered cord surgery

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but should be referred to **surgery** on appearance of the first symptoms [46, 60].

24.8 Operative Technique and Intraoperative Monitoring

Adherence to some general neurosurgical principles will help to improve operative results. With the patient in prone position, special efforts to ensure that the abdomen is free of pressure should be undertaken in order to reduce abdominal venous pressure and prevent unnecessary blood loss. In the presence of spinal curvature, this may be difficult. A midline incision will usually be carried out, which avoids additional cutaneous manifestations and follows scoliotic deformities. In the presence of associated malformations and in recurrent **surgery**, as a rule the surgeon will work from normal to abnormal anatomy.

In primary TCS without associated lesions, hemilaminectomy will be sufficient to approach and transect the filum. Laminectomy and laminotomy will be necessary in cases of additional tumors or myelomeningocele; the latter should be carefully considered in the presence multiple arch defects [34, 52, 59].

If primary dural closure cannot be achieved due to a small dural sac or a large surface after tumor resection that would promote rethether, dural plasty with either tho-

required 100 times the voltage needed to activate a motor root.

24.9 Results and Outcome

Because of the progressive clinical course of the disorder and the good results of untethering, there is general agreement that **surgery** is the method of choice for the treatment of primary TCS. The condition is easily dealt with surgically, with little risk of additional injury. It is also universally accepted that the likelihood of some improvement in neurologic function and the elimination of pain is high [1, 3, 19, 20, 26, 34, 36, 40, 42, 46, 52, 57, 59, 66, 68, 73, 81]. There are, however, differences in outcome with respect to the extent of tethering and displacement of the conus, the presence of additional lesions like myelomeningocele and tumors, and the age of the patient at onset of symptoms.

Neurogenic bladder may not improve after **surgery** at all [36, 46], or only in a small percentage of patients [4, 20, 60, 73], most probably depending on the duration and severity of the disease. The main urologic improvement seen is in bladder capacity [18], probably related to normalization of neurogenic detrusor overactivity [19]. Complete restoration of urinary function to a normal level was reported in all patients in a series of infants up to 3 years of age when **surgery** is performed shortly after

4.

Answering Questions

Experience.
Textbooks.
Conferences.

How To Answer Questions

- ▶ Merlin Method – predict what question they are going to ask by knowing what is spoke about in the literature. Then ask open ended questions and curve ball questions.
- ▶ Give the right answer + acknowledge weakness to your answer + dispute those weaknesses + justify why your answer is right = the right "enough" answer.
- ▶ Avoid their traps. They're there on purpose.
- ▶ Practice as if you were shooting your own Joe v Joe video.

Take It Or Leave It.

5.

Miscellaneous Advice

Build Your Library...

- ▶ Collect as many articles as you can.
- ▶ Read through those articles with a highlighter and pen.
- ▶ Write your own questions off the information given in the article.
- ▶ Use the content of the article for the answer. Copy and past that answer, and then rewrite it a little to be a little more conversational or best answer the question you came up with. This will make it easier to remember.
- ▶ Keep it all in a master word doc that is broken up into reasonable sections.
- ▶ Use cntrl+f to compare responses. Find differences, similarities and trends.

Build Your Library (cont)...

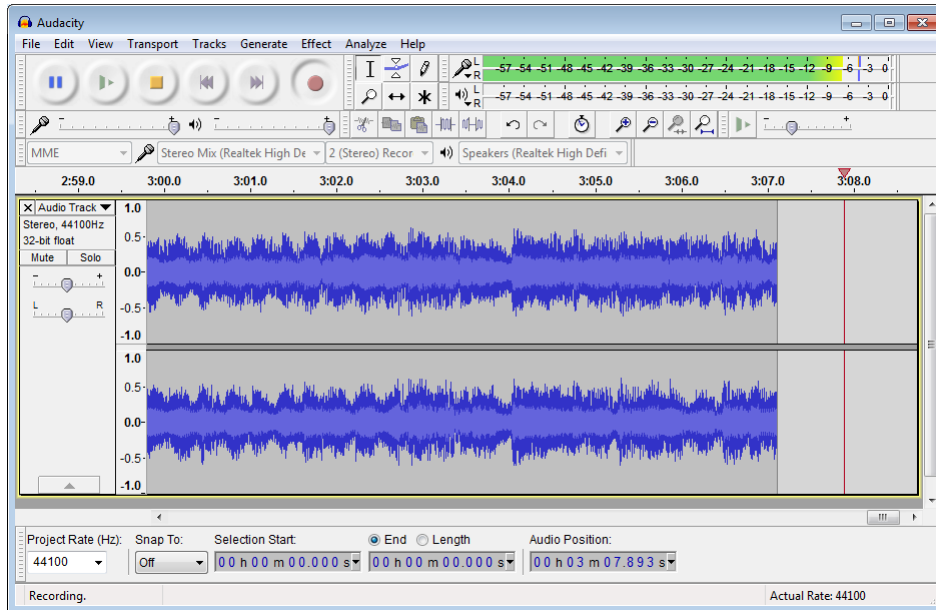
- ▶ Rearrange your questions as if they fell into a sequence of questions.
- ▶ Find images to help put in long term memory
- ▶ In the last section, rearrange the order.
- ▷ Usually you're giving an answer and telling them (author, year). Make a section that starts with (author, year) and you talk about what was presented in that paper and other high points.

Build Your Library... (shortcuts)

- ▶ Find good review of the literature articles.
- ▶ Make sure you know the paper everyone references over the obscure article from the 60's
- ▶ For articles that are images, you are not able to copy and paste the text. If you believe it is taking too long to type out, use a service like <http://www.convert-jpg-to-pdf.net/> to convert the image to pdf. Big time saver.

Rehearse, Rehearse, Rehearse

<http://www.audacityteam.org/>



Know Your Role!

Find all articles offered by associations. These should include recommendations for monitoring, scope of practice, code of ethics, position statements, etc.

Understand the role of D.ABNM and how you would handle situations.

Thinking has to be that of a manager/leader of a group. You need to work through scenarios where you are needed to give expertise.

“To Become, Act As If...”

Phone a friend...

- ▶ Find someone that you can ask for help.
- ▶ See what they think about your answers to questions with no real “right” answer.
- ▶ Have them grill you to no end.
- ▶ Have them tear your submitted case to shreds.
- ▶ See what they’ve got for study material.
- ▶ Be on the look out for others preparing for the exam. Start a study group (people in your company, start a post on the forum, look to see who’s asking questions)

Be A Creap...

- ▶ Find the names of the examiners.
- ▶ Looks for any publications they have.
- ▶ See if you can find any lectures given at conferences.
- ▶ Look to find them in online conversations. Blog comments, LinkedIn groups, forum post, etc.
- ▶ Utilize “confirmation bias”

Good Luck!



CREDITS

Special thanks to all the people who made and released these awesome resources for free:

