

CCF Anesthesiology Review Course

Hints for Mastering the
ABA Anesthesiology Oral
Board Examination

First Edition

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Preface

These informal notes are directed at individuals preparing for the oral examination of the American Board of Anesthesiologists.

Corrections, suggested case scenarios, ideas for improvement and the like are readily accepted, and may be directed to me at the address below.

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[Hint Number 1]

Paper Work

Be sure to get your ABA-related paper work in EARLY.

It would be a shame if you had to delay taking the examination because of a paper work technicality.

Deadlines and other important information are available at the ABA Web site:

<http://www.abanes.org>

[Hint Number 2]

Exam Objectives

Always bear in mind the primary objectives of the ABA oral examination, which are:
“To assess the candidate’s ability to demonstrate the attributes of an ABA Diplomate when managing patients presented in clinical scenarios. The attributes are sound judgment in decision-making and management of surgical and anesthetic complications, appropriate application of scientific principles to clinical problems, adaptability to unexpected changes in the clinical situations, and logical organization and effective

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presentation of information. The oral examination emphasizes the scientific rationale underlying clinical management decisions.”

Reference: http://www.abanes.org/examination/exam_oral.html

Note that underlying pathophysiological principles applied to varied clinical scenarios are repeatedly emphasized in the ABA oral examination. This means that you are not only expected to know WHAT to do in a variety of situations, but also WHY.

Example: It is not enough to know that succinylcholine can produce a deadly hyperkalemic response in patients with spinal cord injuries, in patients with severe burns, etc. You should also be able to discuss what happens at the acetylcholine receptor level in these patients.

[In case you forgot: Acetylcholine receptor upregulation and receptor morphology changes may occur following severe burns, upper or lower motor neuron denervation (e.g., stroke or spinal cord injury, respectively), severe muscle trauma, prolonged intrabdominal sepsis, and prolonged immobilization or ICU care (bed rest, steroids, prolonged neuromuscular blockade). Here, changes in the acetylcholine receptor subunit type and/or an increase in receptor density occur (as “immature” acetylcholine receptors spread over the muscle surface outside the motor endplate area). HOWEVER, note that recent data suggests that hyperkalemic cardiac arrest following succinylcholine can also be caused by acute rhabdomyolysis. See *Gronert GA. Cardiac arrest after*

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succinylcholine: Mortality greater with rhabdomyolysis than receptor upregulation.

Anesthesiology 2001 94:523-529. See also Appendix 1]

[Hint Number 3]

Candidate Evaluation

When you prepare for the ABA examination, bear in mind some of the questions that the examiners ask themselves about the candidates being examined:

- **Does the candidate have a solid foundation of clinical and basic-science knowledge that makes him/her a real consultant in anesthesiology?**

 - **Can the candidate apply that knowledge to real-world clinical situations?**

 - **How does the candidate approach a clinical problem? Does he/she appropriately and systematically organize and prioritize the clinical considerations? Is the approach logical and well thought out?**

 - **Have alternative options (like canceling the case) been carefully explored and understood?**

 - **Above all, does the candidate appear to be clinically safe?**
-

[Hint Number 4]

Reasons for Failure

When you prepare for the ABA examination, bear in mind some of the reasons that candidates fail the oral examination:

- **Lack of clinical and basic science knowledge**

- **Inability to apply knowledge and/or basic science to clinical situations**

- **Language problems – the examiners want thorough, articulate answers**

- **Inability to organize their answers and express their thoughts clearly**

- **Inability to prioritize concurrent or conflicting clinical considerations**

- **Unsound judgment in clinical decision making and in clinical problem solving – above all, the examiners are looking for safe clinicians**

In many cases, these problems can be eliminated by getting feedback via practice oral examinations. **Practice, Practice, Practice!**

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[Hint Number 5] *courtesy of John E. Tetzlaff, M.D.*

Travel

Getting to the site of the ABA oral exam is part of taking the exam. Depending on the exam site and where the candidate lives, this can involve anything from a brief car trip to a transcontinental flight. It is essential that the candidate arrive at the site at a reasonable hour on the day BEFORE the scheduled exam date. There are little literally thousands of things that could delay last minute arrival. At worst, the exam becomes a failure because of a traffic jam or flight delay. Even arriving on time after a delay could increase an already elevated stress level to unacceptable levels.

[Hint Number 6] *courtesy of John E. Tetzlaff, M.D.*

Hotels

There are mixed opinions about staying in the exam hotel. On the plus side, this allows the opportunity to locate the report room in the evening on the day before decreasing the stress immediately before the test. On the downside, the visual and auditory contact with other candidates can cause the loss of confidence (over hearing last minute studying or the stress of the “recently examined”). A good compromise is to choose the exam hotel

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but avoid common facilities like the restaurant and bar, where the encounter of other candidates is likely. Room service or a walk or cab ride to a restaurant may be a good strategic choice.

[Hint Number 7] *courtesy of John E. Tetzlaff, M.D.*

Last Minute Preparation

Proper preparation for the orals is a sustained process involving study and practice oral exams that extends over the entire residency. Last minute preparation should be unnecessary and could be counter-productive. When a good candidate approaches the oral exam, the study process reaches capacity and last minute preparation can have the effect of undermining confidence without increasing readiness. Undermining confidence actually works against preparation. In the last few days, the intensity of study should taper, and at some point, practice exams should cease. Filling your luggage with books for the trip to the orals will accomplish nothing but lumbar strain. Pack a good novel or your favorite magazine for the brief trip and RELAX.

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[Hint Number 8] *courtesy of John E. Tetzlaff, M.D.*

The Last 24 Hours

The final day before your oral exam is a test of self-control. The level of nervous energy you will experience will match or exceed any that you have experienced in your professional career. To optimize your performance during the two hour interval that really matters, you need to control this nervous energy, channeling it in a positive direction. Sleep during the night before the exam is critical. Intoxication and overcaffination are enemies. The evening before your oral exam is a time to do something relaxing – read a novel, watch a movie, reality TV..... (whatever is relaxing for you). Beta blockers and sleep aides have been advocated by some, but the number of adverse-outcome anecdotes argues strongly against self-medication. The practice of anesthesiology involves an early day routine and the morning of your oral exam should follow your routine. If you eat breakfast before work, you should eat breakfast. If not, don't. Keep your caffeine level where it normally is. Dress well but conservatively – avoid fashion statements and items of clothing that call attention to themselves. Avoid being very early or getting down to the last minute before departing from your room. Ladies should plan to avoid using a purse if possible, as this is one more item to worry about. Having a garment with a pocket for your hotel key and writing implements avoids the panic of the missing purse panic, since you must be physically separated from the purse during the exam.

One final suggestion – there's only 24 hours left. Stop studying.

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[Hint Number 9] *courtesy of John E. Tetzlaff, M.D.*

Reading the Question

There are two types of questions for the two sessions that will make up your oral exam, arbitrarily named “A” type and “B” type. The “A” question provides comprehensive preoperative information and surgical plans. The exam starts with Intraoperative issues for 10 minutes, and the candidate is expected to answer on the basis of no unresolved preop issues. The middle 15 minutes are Postoperative issues and the last 10 minutes are Additional Topics. The candidate is provided the question for the “A” session during the briefing session and 20-20 minutes are allowed to read and prepare. The “B” type question is used in the 2nd round of each session. It provides an outline of the surgical pathology, the procedure and a list of co morbidity, medications and vital signs. Ten minutes (exactly) are allowed between exams and this is the only preparation interval. The exam starts with 10 minutes of questions about Preoperative Preparation followed by 15 minutes of Intraoperative Management and Additional Topics. Both questions are printed on a page. It should be read carefully (at least twice) and written on. The 2nd reading should focus on identifying some of the issues that are likely to be key issues during the exam. It is also critical to explicitly plan an anesthetic, including premedication, monitors, agents and emergence. It is a waste of valuable time and thought to have preoperative questions before the “A” exam, because the examiners will begin at Intraoperative Management and not be willing to go backward. It is critical to exert complete self-control between “A” and “B” round. It is human nature to sit and

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obsess about performance during the first exam, except that every second of doing so is one less second of preparing for round two – there is plenty of time to ruminate at the airport and on the plane.

[Hint Number 10a] *courtesy of John E. Tetzlaff, M.D.*

Strategic Answers

This suggestion comes from the legal education arena. When learning the process of cross-examination during trial law classes, law students are taught to not ask a question unless they already know the answer. For the ABA oral examination, this concept applies in reverse. When answering a question, if the candidate's fund of knowledge is deep, the answer can include a brief justification. Good depth of knowledge will be evident and the examiner will sense the substantial knowledge of the candidate. Conversely, if the dept of knowledge for a given question is limited, the answer should be brief. This may prompt the examiner to issue a follow up question. This may come in a format that the candidate can answer. If not, a good answer is "I do not know", and more importantly, this avoids the temptation to guess and focus the examiner on an area where repeated gaps in knowledge can be demonstrated.

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[Hint Number 10b]

Answering the Impossible Question

It is traditional on every oral examination that the candidate get hit with a question for which there is no good answer. A typical example concerns the parturient with a known difficult airway that now has extreme fetal bradycardia or a prolapsed cord and needs a stat c-section. In such a case, no matter what answer you give, the examiner can give you good reasons why that option won't work.

If you put the patient to sleep, you won't be able to intubate:

- If you try awake fiberoptic intubation, the examiner will emphasize the fact that the baby is dying and a speedier choice is necessary.
- If you mention doing a spinal, the examiner will say that the patient is in the Trendelenberg position with the obstetrical resident's hand trying to push the prolapsed cord back into the uterus.
- If you mention local anesthesia, the examiner will state that the obstetrician has never done anything like this and if not about to start now.

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However, the examiners know full well that there is no good answer to the question.

They are interested that your answer is reasonable and thoughtful and that you are aware of the various options, as bad as they may all be. A bad answer would be to say "This is an impossible situation. I would let the baby die because I'm not about to take any risks with the mother."

Sometimes the impossible question has ethical dimensions, such as a prisoner who has been stabbed in a drug deal gone bad, but makes it clear that he does not want any surgery, even though the clinical need for surgical intervention is obvious.

Another example is the adult Jehovah's Witness patient who is in hypovolemic shock and unconscious following a car accident. You may be placed in a setting where the patient will die if not given blood, but where you would be in violation of the patient's clearly expressed wishes if blood is given. Then they might make the whole mess even more complicated by making the patient a minor.

The idea in giving you these scenarios is to see how well you handle stress, identify the various options, and how you justify your decision even though it is necessarily imperfect.

That's a tall order, but the exam is looking for consultants, not technicians.

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[Hint Number 11] *courtesy of John E. Tetzlaff, M.D.*

Danger Signs

One of the most common ways to get in trouble during an oral exam is the failure to listen carefully. The candidate is very focused on what is being said, has been and is about to be. With all this noise, it is not hard to understand how a key word in a sentence could be missed, and the answer delivered could be correct in theory but wrong because it isn't the answer to the question that was asked. In some instances, the examiner may sense this possibility and repose the question, perhaps reformatted. The candidate should recognize this as a warning sign. The candidate should quickly identify the context and think carefully to make sure that something vital has been neglected such as resuscitation or ABC issues. Remember, setting the context is better done with a parenthetical statement ("I assume that the blood pressure has not changed") versus asking a question ("What is the blood pressure?"). The question will prompt, a "why is that important?" question, where the parenthetical statement will prompt the examiner to re-set the context.

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[Hint Number 12] *courtesy of John E. Tetzlaff, M.D.*

Professional Answers

In the energy of the oral exam, the candidate will want to do well. One of the temptations will be to make every answer impressive. Certainly, this is good, if impressive is a clear, concise answer that suggests depth of knowledge. One counter-productive strategy is the plan to fill each answer with expansive explanations. When asked a question, your college English professor would fill the answer with as much prose as he/she could create. Using this approach in the ABA oral exam will frustrate the examiners and not add to the performance of the candidate. The other temptation which can also be counter-productive is to answer simple clinical questions with information derived from the most current literature. Often, the standard answer to the question may be intentionally challenged in this report. Ultimately the scientific validity of the article will be supported or refuted by other evidence, and published in major textbooks. Before this time, it puts the candidate in the position of arguing the literature, which is dangerous and worse, the examiner may not have read this reference, and may believe the contradictory side. Arguing science with an examiner, particularly a senior examiner, is not wise. Venturing incomplete versions of subspecialty science is also dangerous. The candidate may accidentally enter an argument with an expert, since board examiners are selected from academic practices, where research originates from. There are numerous anecdotes of candidates trying to sneak a scientific bluff past an examiner, who turns out to be an expert in the science. The exchange that follows demonstrates significant gaps in the

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candidate's depth of knowledge and/or judgment and in the "urban legend" of these stories, flips a solid pass to a fail.

[Hint Number 13] *courtesy of John E. Tetzlaff, M.D.*

What is a "Gradable" Answer?

The goal of the candidate should be to provide the maximum number of answers that can influence the outcome. One of the strategies to maximize this element of performance on the oral exam is to minimize the number of upgradeable answers. Use of ASA standard monitors is assumed and answering a question with "application of ASA standard monitors" accomplishes nothing. Sweeping general statements like "I would completely review the medical record" or "I would perform a complete physical exam" gain nothing for the candidate but a follow up question. A more appropriate response identifies which elements of the history or physical exam are relevant and why. Yes and no answers about selection of a specific technique are incomplete and not gradable without a reason. A good tactic is to provide the reason with the answer. The reason should be based on anatomy, physiology or pharmacology, which are gradable, versus personal preference, which is not. If two options are physiologically equal, it is acceptable and gradable. Medicolegal risk must be presented in context of correct physiology or identified in a

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defensible context. Ethics and professionalism can be gradable answers under specific circumstances.

[Hint Number 14] *courtesy of John E. Tetzlaff, M.D.*

“I Don’t Know”

“I don’t know” is not a statement that any candidate wants to use frequently during either the oral exam sessions. However, knowing when and how to say “I don’t know” can save a pass or prevent a fail. The use of “I don’t know” is an excellent alternative to a guess. A tentative guess will sound like a bluff and prompt the examiner to explore an area with gaps. If the candidate selects “I don’t know”, this will prompt the examiner to create a follow-up question. There may be enough new information in the follow-up question to allow a successful response by the candidate. Since the oral is not an absolute knowledge exam, when an “I don’t know” is encountered, the examiners are expected to ask the candidate to apply knowledge. Often, this will present a question that will give the candidate enough of a clue to allow a successful answer.

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[Hints 15 - 25]

Study Cards

Early in your study program, make up a series of “study cards” using small index cards.

You will want to have a series of cards for each of the following:

[Hint 15] Drug synopses (e.g., information on succinylcholine)

[Hint 16] Procedure synopses (e.g., how to do a Bier block)

[Hint 17] Differential diagnosis in anesthesia (e.g., intraoperative oliguria)

[Hint 18] Approach to interoperative problems (e.g., elevated airway pressure)

[Hint 19] Anesthetic considerations (e.g., diabetic patients)

[Hint 20] Airway issues and problems (e.g., can't intubate)

[Hint 21] Important anatomical information (e.g., brachial plexus layout)

[Hint 22] Algorithms (e.g., preoperative evaluation of the cardiac patient)

[Hint 23] Consensus statements (e.g., neuraxial blockade and anticoagulants)

[Hint 24] Landmark studies

[Hint 25] Safety features of the anesthesia machine

Keep some of these cards with you at all times, so that you can MEMORIZE them whenever time becomes available. Study them in airport lounges, while waiting for late surgeons to show up, while in the cafeteria line, or at any other opportunity. Of course,

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the cards need not be in paper format. You can put them in Palm Pilot format (or other electronic format) for easy editing / updating, and you can even “beam” the cards to your study group friends. See Appendix 3 for a sample information synopsis.

[Hint Number 26]

Help from the Europeans



The European Society of Anesthesiologists maintains a large collection of FREE, high-quality refresher course lectures on the Web at:

<http://www.euroanesthesia.org/education/refreshcourses.php>

Here are some sample titles:

Update on New Drugs & Techniques For Pain & Emesis (2002)

http://www.euroanesthesia.org/education/rc_nice/2rc1.html

Update on anaesthetic drugs & techniques for ambulatory anaesthesia (2001)

http://www.euroanesthesia.org/education/rc_gothenburg/2rc2.HTML

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Techniques for measuring the depth of anaesthesia (2001)

http://www.euroanesthesia.org/education/rc_gothenburg/3rc3.HTML

Does regional anaesthesia improve outcome after surgery? (2001)

http://www.euroanesthesia.org/education/rc_gothenburg/1rc2.HTML

Hepatic blood flow during anaesthesia and surgery (2000)

http://www.euroanesthesia.org/education/rc_vienna/04rc1.HTM

Anaesthesia for chest trauma (1999)

http://www.euroanesthesia.org/education/rc_amsterdam/04rc2.HTM

[Hint Number 27]

Help from the Canadians



The Canadian Anesthesiologists' Society / Canadian Journal of Anesthesia maintains a nice collection of FREE, high-quality refresher course lectures on the Web at:

<http://www.cja-jca.org/>

Here are some sample refresher course lecture titles from 2004:

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- **Paravertebral anesthesia and analgesia**
Can J Anesth 2004 51: R3.
- **Risk assessment in ambulatory surgery: challenges and new trends**
Can J Anesth 2004 51: R4.
- **General anesthesia for obstetrics**
Can J Anesth 2004 51: R5.
- **Laryngoscopy — its past and future**
Can J Anesth 2004 51: R6.
- **Hazards of anesthesia gas delivery systems**
Can J Anesth 2004 51: R7.
- **Current status of hypothermia as a treatment modality**
Can J Anesth 2004 51: R8.
- **New anticoagulants and antiplatelet agents**
Can J Anesth 2004 51: R9.
- **Tricky problems in pediatric anesthesia**
Can J Anesth 2004 51: R10.
- **Mechanisms and treatment issues for neuropathic pain**
Can J Anesth 2004 51: R11.
- **Advances in labour analgesia**
Can J Anesth 2004 51: R12.
- **Preoperative laboratory testing: necessary or overkill?**
Can J Anesth 2004 51: R13.

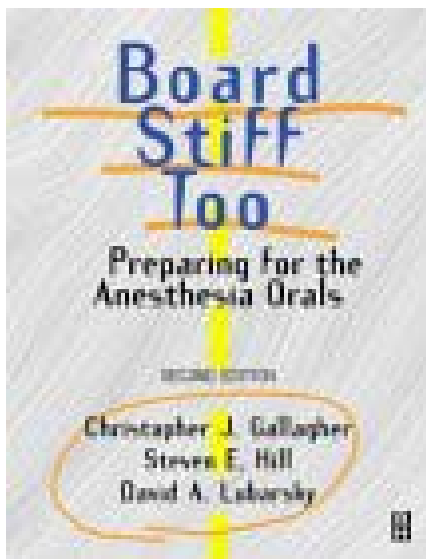
[Hint Number 28]

Get a copy of “**Board Stiff Too. Preparing for the Anesthesia Orals**”

Read it.

Read it again.

And again.



Gallagher, Christopher J., MD; Hill, Steven E. , MD;
Lubarsky, David A. , MD. **Board Stiff Too. Preparing
for the Anesthesia Orals. \$55.95**

ISBN: 0750671572

Format: Paperback, 390pp

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Publisher: Elsevier Science

FROM THE PUBLISHER

The Second Edition of this study guide is a must-have for every resident preparing to take the anesthesia oral examination. Based on information culled from scores of examinees, this portable workbook presents case scenarios and questions similar to those encountered on the oral boards. In addition, the authors provide helpful tips on how to best prepare for the exam. A brief review of the major subjects, such as difficult airway, trauma, and pain, that appear on the test is also provided. Since there is often no single correct answer to an anesthesiology question, the authors discuss how to formulate a rational decision that can be defended. Board Stiff is the ultimate resource for residents who want to pass the oral boards on their first attempt.

Board Stiff Too: Preparing For the Anesthesia Orals, Second Edition.

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James C. Eisenach, M.D., was acting Editor-in-Chief for this article.

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Board Stiff Too: Preparing For the Anesthesia Orals, Second Edition.

By Christopher J. Gallagher, M.D., Steven E. Hill, M.D., David A. Lubarsky, M.D. Woburn, Butterworth-Heinemann, 2001. Pages: 390. Price: \$46.00.

ANESTHESIOLOGISTS encounter intense stress on a daily basis. The nature of the profession demands that they anticipate, recognize, and manage potentially lethal complications during the case of every patient. Interestingly, there is a situation that can be even more stressful for the anesthesiologist than those dreadful complications-taking the oral board examination.

The final stage of the board certification process requires the candidate to display, during simulated clinical scenarios, the qualities worthy of a professional consultant in anesthesiology. In addition to knowledge, however, a successful candidate should possess an appropriate level of judgment, application, adaptability, and clarity of expression. For those who have been taking written examinations all of their lives, the requirements may seem vague and subjective. Unfamiliarity with the format can be a critical weakness in taking this type of examination.

Board Stiff Too, the second edition of the very successful original, provides unconventional, yet indispensable, information to those who are knowledgeable of the particulars involved, yet unfamiliar with the oral board process. As represented by the title, this expanded version is unique among the professional textbooks and review books available. First, the tone and style of the text cannot be more conversational and empathetic. The authors do not present themselves as superior to the reader, either intellectually or professionally. The only difference is experience. These authors already have gone through the process of taking and passing the oral examination. As a result, the authors quickly establish intense emotional bonding with a trusting and receptive readership. The authors represent friends, not enemies. Second, *Board Stiff Too* delivers content not found in any other review book. It focuses on strategies and advice. It basically compiles all recurrent advice and tips floating around the operating room area during the frenzy time just before the examination. *Board Stiff Too* will not teach you how to practice anesthesiology well, but it may teach you how to prepare for an oral examination. The new and improved edition is divided into three sections. The first section, Driving School, contains advice on strategies for preparation, common reasons for failure, and the examination format. The second section, Mechanic's Manual, contains a general overview of problems associated with vital signs, equipment, airway, obstetrics, trauma, pediatrics, and so on. By no means is the information here sufficient to prepare for the examination, but then, that is not the purpose of the section. The third section, Test Tract, provides simulated test outlines and answers mixed with personal critiques.

The authors expect two things of the readers. First, the reader must have already acquired a sufficient base of knowledge to pass the examination. Second, the reader must repeatedly practice mock oral examinations aloud before the actual examination. Without either of these two factors, this book is not going to serve its sole purpose: to help the reader pass the oral board examination. In short, *Board Stiff Too* is ideal for the candidate with sufficient knowledge, who needs to familiarize him or herself with the examination format and develop appropriate strategies for expressing knowledge and judgment.

[Hint Number 29]

Know the AHA/ACC guidelines on the perioperative cardiovascular evaluation for non-cardiac surgery.

In 1996, a task force of the American Heart Association and American College of Cardiology (AHA/ACC) published clinical guidelines concerning the perioperative evaluation of cardiac patients for non-cardiac surgery. As new data became available, these guidelines were updated (March 2002). The philosophy of the guidelines is that

"pre-operative intervention is rarely necessary simply to lower the risk of surgery, unless such intervention is indicated irrespective of the perioperative context. No test should be performed unless it is likely to influence patient treatment".

A synopsis of this material is available in Appendix 2.

Full guidelines involving an 8-step algorithm are available on the Web at:

http://www.acc.org/clinical/guidelines/perio/clean/perio_index.htm

An executive summary is available online at:

http://www.acc.org/clinical/guidelines/perio/exec_summ/periop_index.htm

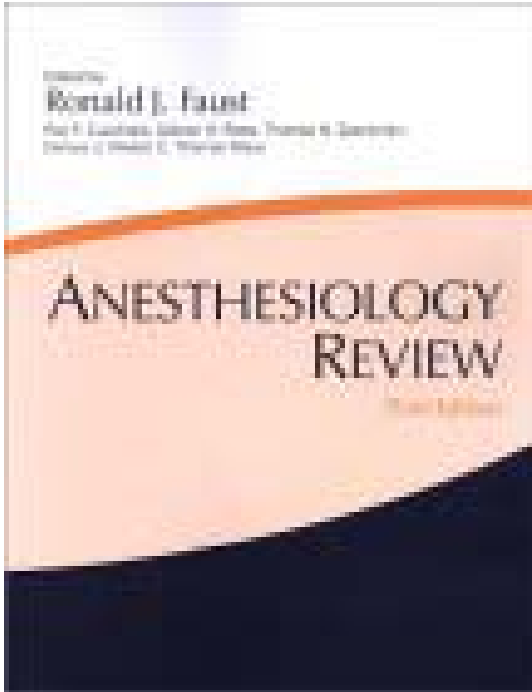
Finally, a pocket guide is available online at:

http://www.acc.org/clinical/guidelines/perio/Periop_pkt.pdf

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[Hint Number 30]

Faust's Anesthesiology Review



If you are looking for a book that provides a nice series of compact (1-2 pages) clinical synopses, consider Faust's Anesthesiology Review, 3rd Edition. Highly recommended!

- **Paperback:** 595 pages
- **Publisher:** W.B. Saunders
- **ISBN:** 0443066019
- **\$61.95**

[Hint Number 31]

Generic Drug Names

Always use generic drug names.

- Use midazolam - not Versed.
- Use propofol – not Diprivan

[Hint Number 32]

You may be asked the question “Would this case be safer to carry out using regional anesthesia?” You should say something like this ...

The risks of life threatening events are substantially increased after major surgery, but there is debate about whether the type of anesthesia plays a big role. Neuraxial blockade has several physiological effects that provide a rationale for expecting to improve outcome with this technique. There effects are ... (YOU SHOULD HAVE THIS LIST ON A REVIEW CARD, READY TO BE MEMORIZED).

Unfortunately, the few clinical trials of epidural or spinal anesthesia that have focused specifically on fatal or life threatening events have been underpowered. Recently, a meta-analysis published in BMJ has provided encouraging information (see Anthony Rodgers et al. Reduction of postoperative mortality and morbidity with epidural or spinal anaesthesia: results from overview of randomised trials. BMJ. 2000 16; 321(7275): 1493. Available online at <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=27550>). Here is what they say:

What is already known on this topic

- Neuraxial blockade with epidural or spinal anesthesia reduces the incidence of deep vein thrombosis and one month mortality in hip fracture patients
- Insufficient evidence exists for other postoperative outcomes in this surgical group

What this study adds

- Mortality was reduced by one third in patients allocated neuraxial blockade
- Reductions in mortality did not differ by surgical group, type of blockade, or in trials in which neuraxial blockade was combined with general anesthesia
- Neuraxial blockade also reduced the risk of deep vein thrombosis, pulmonary embolism, transfusion requirements, pneumonia, respiratory depression, myocardial infarction, and renal failure

[Hint Number 33]

When answering questions ...

Avoid verbosity ... Speak confidently

NOT

- Gee... there are so many ways you could do this case. I'm not sure how I'd go about it. I suppose...
- Oh my ... what a tough question. I've never really had a case like that one. I suppose I could ...

BUT

- Although there are several management options here, I would prefer a continuous lumbar epidural technique for several reasons, the most important being...
- I would employ a Bier block using preservative-free 0.5 % lidocaine without epinephrine, in a dose not exceeding 5 mg/kg.

AVOID

- "might"
- "probably"

[Hint Number 34]

Be sure to identify the key considerations of the case early in your answer. Use a hierarchical approach where possible.

EXAMPLE: This 38 week gestation pregnant patient can be thought of as consisting of two patients. In addition, as a parturient, she has a full stomach, has a potentially difficult airway, has potential for developing preeclampsia, etc.

EXAMPLE: This 3 year old boy, like all young pediatric patients, has altered pharmacokinetics and pharmacodynamics, has increased oxygen consumption per kg, has airway differences as compared to an adult, etc.

EXAMPLE: This otherwise healthy but mildly obese 42 year old nonsmoking ASA 2 patient is scheduled for a bowel resection. He has primary hypertension well managed by atenolol but requires no further investigations.

[Hint Number 35]

Know some standard phrases and use them fluently.

STARTING A CASE

After having checked my machine and equipment, drawn up all my drugs, applied the standard patient monitors and started an IV, I would...

EMERGENCIES

This is a serious emergency which requires immediate action ...

EMERGENCY AIRWAY ASSESSMENT

I would first determine that the patient's airway was not obstructed ...

INDICATING KNOWLEDGE OF TOXIC DOSES

I would use plain lidocaine in a dose not exceeding 5 mg/kg...

DISCUSSING KEY CONSIDERATIONS

Assuming that there are no other problems than the ones identified so far, ...

EMPHASIZING SPECIAL CONCERNS

In addition to my usual preoperative assessment, I would pay particular attention to

_____ ...

[Hint Number 36]

Know when to stop resuscitating and start giving anesthesia.

EXAMPLE

Continuing prolonged nonsurgical resuscitation in spite of being unable to keep up with the blood loss is a common mistake, both in the oral exam and in real life.

Sometimes the correct answer is to proceed with surgery despite imperfect resuscitation.

[Hint Number 37]

Know when to stop investigation and start giving anesthesia.

EXAMPLE

If you insist on a cardiac catheterization study prior to arthroscopy in an asymptomatic patient with good exercise tolerance who had an uncomplicated myocardial infarct 3 years ago, the examiners will not be impressed by your cautious nature.

[Hint Number 38]

Know the "clinical crisis protocol": “*Look, Listen, Feel, Get*”

Use it to enrich your answers.

What to do when you don't know what to do.

The "crisis protocol" is an approach to managing the patient whose life is in danger (eg, from stridor) and when there is limited time to act. More examples are given in the table below. Because response time is so limited, diagnosis of the problem must be accompanied by empirical treatment, i.e. diagnosis and treatment must be carried out concurrently, even when it may be far from clear what is going on. For example, severe bradycardia (heart rate < 40) may or may not be associated with symptoms such as syncope and can be due to many different causes (e.g., third degree heart block, beta blocker overdose, use of an anticholinesterase without sufficient anticholinergic (e.g., neostigmine without atropine) increased intracranial pressure, etc.).

Crisis Management in Anesthesiology, by Gaba, Fish, and Howard (Churchill Livingstone, New York) presents a basic protocol for the management of serious problems. While empirical treatment is essential while diagnostic measures are in progress (for example, giving intravenous atropine (0.6- 1 mg) in the case of symptomatic severe bradycardia), there are several other equally important

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aspects of successful crisis management. These include (1) mobilizing and allocating all available resources (e.g., personnel, supplies and equipment, cognitive aids such as checklists, and external resources such as lab services and consultants), (2) proper allocation of attention during this period of high demands, (3) planning ahead and anticipating (i.e. "staying ahead of the game"), (4) efficient distribution of the workload amongst all available personnel, and (5) frequent reevaluation the situation to avoid fixation errors. Also, the initiation of immediate life-support measures applies to virtually all crises. These measures include (1) discontinuing anesthetics (intraoperative crises), (2) increase the oxygen concentration to 100%, and verify that it approaches 100%, (3) maintain oxygenation at all costs (if in doubt about a ventilation system or oxygen supply, use a backup system or alternate oxygen source, and (4) ensure that the patient has a pulse and that blood pressure is acceptable (if not, commence ACLS protocol).

Examples of Urgent Clinical Problems Requiring Immediate Intervention

- Intraoperative ventricular tachycardia, cardiac arrest
- Cyanosis in recovery room
- Grand-mal seizures
- Severe bradycardia or tachycardia
- Stridor
- Syncopal attack

Some Forms of Initial Empirical Treatment

- Dx: Symptomatic bradycardia
Rx: IV atropine 0.6 - 1 mg (or IV glycopyrrolate 0.2-0.4 mg)

- Dx: Postintubation sinus tachycardia in patient with coronary artery disease
Rx: IV esmolol 10-40 mg

- Dx: Sustained apnea
Rx: Positive pressure ventilation

- Dx: Pulseless ventricular tachycardia
Rx: Treat as ventricular fibrillation with defibrillation and ACLS protocol

- Dx: Severe hypoxemia
Rx: 100% oxygen +/- endotracheal intubation

- Dx: Ventricular fibrillation
Rx: Defibrillation; ACLS protocol

Approach to the Patient in Crisis: "Look, Listen, Feel, Get"

Look

- Color - cyanosis (hypoxia) - pallor – patient's ethnicity (e.g. sickle cell disease in Blacks)
- Restlessness / discomfort
- Diaphoresis
- Wound Sites / Drains
- Neck - Jugular venous pulsations - Trachea - Hematomas
(e.g. post carotid surgery)
- Respiration - rate - depth - pattern
- Full body exposure/ secondary survey

Listen

- Listen to the patient's complaints and observations of bystanders
- Stridor and other breathing noises
- Heart sounds (?muffled, ?murmur, ?gallop)
- Air entry - equal bilaterally? - wheezes? - crackles?

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Feel

- Pulse
 - rate
 - intensity
 - pattern
- Forehead - diaphoresis? - fever?
- Grip strength
- Subcutaneous emphysema

Get

- Help
- Crash cart and other equipment/resources, as needed
- Vital signs
- Old chart
- Laboratory tests e.g. arterial blood gases, chest x-ray, electrolytes, etc.

[Hint Number 39]

Know and avoid the many traps awaiting you in the oral examination. Here is a list:

1. **Poor organization of answer.**
2. **Excessive verbosity. Lack of fluency and clarity.**
3. **Not distinguishing between standard and controversial practice.**
4. **Not admitting ignorance. Bluffing.**
5. **Mentioning things with which you are unfamiliar. For instance, don't mention systolic time intervals, or the sympathogalvanic reflex unless you are prepared to discuss them with the examiner.**
6. **Not canceling a case appropriately.**
7. **Not proceeding appropriately to do a necessary case.**
8. **Forgetting to mention the obvious (e.g., giving oxygen).**
9. **Not knowing the differential diagnosis "down cold" (e.g., increased airway pressure).**
10. **Getting shaken up by "no-win" situations.**
11. **Not emphasizing the emergency nature of the situation.**

[Hint Number 40]

Local Anesthetics

Whenever discussing a case involving the use of local anesthetics, let the examiner know that you know the maximum dose without having him or her specifically ask you.

- **EXAMPLE 1:** I would do a Bier block using 0.5% plain lidocaine. The maximum dose of lidocaine without epinephrine is 5mg/kg or 400mg in this 80kg patient. Using 0.5% plain lidocaine, that works out to a maximum of 80ml. I would use only 40 to 50ml to provide a nice safety margin.
- **EXAMPLE 2:** I would use 0.25% bupivacaine with epinephrine 1 in 200,000, in a dose not exceeding 3mg/kg.
- **EXAMPLE 3:** Because a motor block is important in this case I would use 0.5% ropivacaine in a dose not exceeding 3mg/kg. In addition, ropivacaine has less toxicity than bupivacaine.

Want a nice free review of local anesthetics? Try this:

Local anesthesia. Topical application, local infiltration, and field block
Dwight W. Smith, MD; Matthew R. Peterson, MD; Scott C. DeBerard, DO
VOL 106 / NO 2 / AUGUST 1999 / POSTGRADUATE MEDICINE
http://www.postgradmed.com/issues/1999/08_99/smith.htm

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[Hint Number 41]

In answering a complex case management question, always remember that the examiner may not necessarily expect you to do the case all by yourself.

In many cases it is entirely appropriate to say things like:

“I’d really like to have a second pair of hands available for a case like this. In our hospital the anesthesia coordinator frequently helps out to make complicated cases run smoothly. I’d be sure to consult with him and get his help before proceeding.”

Or

“I’d make sure that an ENT surgeon was in the room before proceeding. This is the kind of case where airway problems can develop quickly, and if an ENT surgeon experienced in the area of a rigid bronchoscope (or whatever) is in the room with his equipment all ready I think the situation would be much safer.”

Or

“This is starting to look like a case of DIC. I’d be sure to call the hematologist on call for some advice, as well as to help smooth out any possible issues with the blood bank”

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[Hint Number 42]

SEVEN PHASES TO ORGANIZING AND MANAGING AN ANESTHESIA CASE

1. PREOPERATIVE ASSESSMENT

- **History** (including anesthetic history, previous airway problems)
 - **Physical** (esp. cardiopulmonary)
 - **Lab** (esp. hemoglobin, EKG)
 - **Consent** (*problems*: underage, unconscious, Jehovah's Witness child)
 - **Consultations** (e.g. cardiology consult in patient with recent myocardial infarct)
 - **Blood bank** (e.g. crossmatch)
 - **Fasting status** (how many hours for liquids? for solids? special rules for kids)
- Old anesthetic charts can be helpful*

2. PATIENT PREPARATION

Optimization (e.g., fluids or blood with hypovolemia, preoperative bronchodilators, nitroglycerine patch or paste)

Drugs

- preoperative sedation
- usual medications
- antacids or H2 blockers (e.g. patient with full stomach)
- drying agents (glycopyrrolate)
- prophylactic drugs
 - nitroglycerine patch or paste
 - bronchodilators
- drugs to discontinue (e.g., MAOIs)

3. OR PREPARATION

“*MSMAID*” is a good mnemonic:

- Machine check
- Suction
- Monitoring equipment and lines
- Airway supplies
- IV Lines
- Drugs

4. INDUCTION CONCERNS

Drugs to be drawn up for emergencies
... may include: atropine, nitroglycerine, ephedrine, phenylephrine, esmolol etc.

Venous access needs (bloody cases)
... cardiac redo cases, liver transplant cases, coagulopathy (hemophilia, von Willebrands, extreme liver disease etc.)

Special monitoring needs
(CVP line, PA line, EP, EEG)

Hypovolemic patient
... how to decide if replacement is OK

Hypertensive patient
... how to decide when a-line is needed

Increased ICP
... lidocaine vs esmolol ?dose ?timing

Difficult Airway
... awake vs. asleep; special equipment

Full Stomach
... regional vs. RSI vs. awake intubation

Unstable Cervical Spine
... awake vs. asleep; special equipment

5. MAINTENANCE CONCERNS

Adequate depth of anesthesia
Maintaining fluid balance
What to do about decreased urine output
Deciding when and what to transfuse
What degree of relaxation is necessary?

6. EMERGENCE CONCERNS

Extubate wide awake (e.g., full stomach)
Delayed extubation (e.g., ICU transfer)
Avoid coughing (e.g., increased ICP)

7. POSTOPERATIVE CONCERNS

e.g., orders, analgesia (epidural vs. IM vs. PCA), postoperative monitoring, possible need for ICU bed

[Hint Number 43]

Regional Anesthesia in a Patient with a Known Difficult Airway

One common question on the oral boards concerns the debate about when it is appropriate to proceed with regional anesthesia in a patient with a known difficult airway (as opposed to, say, performing an awake intubation and proceeding with general anesthesia).

The information below nicely summarizes the discussion.

FACTORS TO CONSIDER IN PROCEEDING WITH REGIONAL ANESTHESIA (RA) AFTER THE PATIENT HAS BEEN JUDGED TO HAVE A DIFFICULT AIRWAY

SOURCE: Barash, 4th Edition. Table 23-12.

May Consider RA	Should Not Consider RA
Superficial surgery Minimal sedation needed Anesthetic may be provided with local infiltration	Cavity-invading surgery Significant sedation needed Extensive neuroaxial local anes- thetic administration will be re- quired, or risk of intravascular injection/absorption is high
Access to the airway is good Surgery can be halted at any time	Access to the airway is poor Surgery cannot be stopped once started

[Hint Number 44]

Laboratory Testing

One common question on the oral boards concerns the appropriate laboratory tests to order preoperatively. The information below nicely summarizes the discussion.

ELECTROCARDIOGRAM

Age 50 or older
Significant cardiocirculatory disease
Diabetes mellitus (age 40 or older)
Renal disease
Other major metabolic disease
Procedure level 5*

CHEST X-RAY

Asthma or COPD that is debilitating or with change of symptoms
or acute episode within past 6 months
Cardiothoracic procedure
Procedure level 4

SERUM CHEMISTRIES

Renal disease
Adrenal or thyroid disorders
Diuretic therapy
Chemotherapy
Procedure level 5

URINALYSIS

Diabetes mellitus
Renal disease
Genitourologic procedure
Recent genitourinary infection
Metabolic disorder involving renal function
Procedure level 5

COMPLETE BLOOD COUNT

Hematologic disorder
Vascular procedure
Chemotherapy
Procedure level 4

COAGULATION STUDIES

Anticoagulation therapy
Vascular procedure
Procedure level 5

PREGNANCY TESTING

Patients for whom pregnancy might complicate the surgery
Patients of uncertain status by history

* Five surgical categories are defined, with a higher category denoting increasing invasiveness. Blood loss and estimated risk are also taken into account in this system. Procedure level 4, defined as highly invasive procedures with blood loss >1500 ml and major risk to patients independent of anesthesia, includes major orthopedic surgery, reconstruction of the GI tract, and vascular repair without an ICU stay. Procedure level 5 is similar to level 4, but includes a usual postoperative ICU stay with invasive monitoring. Reproduced with permission from Pasternak LR: Screening patients: Strategies and studies. In McGoldrick K (ed): Ambulatory Anesthesiology: A Problem-Oriented Approach, p 15. Baltimore, Williams & Wilkins, 1995.

SOURCE: Barash, 4th Edition. Table 18-13.

[Hint Number 45]

Pediatric Airways

One question on the oral boards that sometimes arises concerns the differences between adult and pediatric airways. The information below nicely summarizes the discussion.

ANATOMIC DIFFERENCES BETWEEN THE PEDIATRIC AND ADULT AIRWAYS

SOURCE: Barash, 4th Edition. Table 23-1.

Proportionately smaller infant/child larynx
Narrowest portion: Cricoid cartilage in infant/child; vocal folds in adult
Relative vertical location: C3, C4, C5 in infant/child; C4, C5, C6 in adult
Epiglottis: Longer, narrower, and stiffer in infant/child
Aryepiglottic folds closer to midline in infant/child
Vocal folds: Anterior angle with respect to perpendicular axis of larynx in infant/child
Pliable laryngeal cartilage in infant/child
Mucosa more vulnerable to trauma in infant/child

[Hint Number 46]

Pacemakers

One question on the oral boards that sometimes arises concerns pacemakers and their designation / classification. The information below nicely summarizes the discussion.

<i>PACEMAKER DESIGNATIONS</i>				
1 Chamber- Paced	2 Chamber- Sensed	3 Response	4 Programmability	5 Antitachy- cardia Function
Atrium	Atrium	Inhibit	Programmable (rate/output)	Bursts
Ventricle	Ventricle	Trigger	Multiprogrammable	Normal rate Competition
Double (A/V)	Double O/None	Double O/None Reverse	Communicating O/None	Scanning External

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The original pacemaker designation used a three-position code. Subsequently, expanded positions were added (4, 5). For example, the presence of atrial fibrillation may require a pacemaker with the code **VVI**. This designation indicates (1) **V**entricle is paced, (2) **V**entricle is sensed, and the pacemaker is (3) **I**nhibited if a cardiac event is sensed.

SOURCE: Barash, 4th Edition.

[Hint Number 47]

Potent Inhaled Anesthetic Agents

One question on the oral boards that sometimes arises concerns the differences between various potent inhaled anesthetic agents. The information below nicely summarizes the discussion.

Agent	Minimum alveolar concentration (%)	Strengths	Weaknesses
Nitrous oxide	105	Analgesia Rapid uptake and elimination Little cardiac or respiratory depression	Sympathetic stimulation Expansion of closed air spaces Interference with vitamin B ₁₂ metabolism Limitation of Fio ₂
Halothane	0.75	Low cost Effectiveness in low concentrations Little airway irritability Uterine relaxation	Less chemical stability Slow uptake and elimination Biodegradability Hepatic necrosis Cardiac depression and arrhythmias
Enflurane	1.68	Good muscle relaxation Stable cardiac rate and rhythm	Pungent odor Seizure activity on electroencephalography
Isflurane	1.15	Good muscle relaxation Stable cardiac rate and rhythm	Pungent odor
Desflurane	6	Usability in neurosurgery Rapid induction and emergence	Pungent odor Causes coughing High vapor pressure (Boiling point 23.5°C) Requires special pressurized vaporizer
Sevoflurane	1.71	High cost Rapid induction and emergence Less pungent Good for mask induction	High cost Metabolized in liver, producing increased plasma fluoride

Adapted from Miller FL, Marshall BE. The inhaled anesthetics. In: Longnecker DE, Murphy FL, eds. Introduction to anesthesia, 8th ed. Philadelphia: WB Saunders, 1992:77.

COMMON INHALATION AGENTS: MINIMUM ALVEOLAR CONCENTRATIONS AND EFFECTS
From Surgery: Scientific Principles & Practice Table 13.1.

3rd Edition © 2001 Lippincott Williams & Wilkins

[Hint Number 48]

Perioperative Fluid Management

One question on the oral boards that sometimes arises concerns perioperative fluid management. The information below nicely summarizes the discussion.

Preoperative deficit	Maintenance IVF \times hr n.p.o., plus preexisting deficit related to disease state
Maintenance fluids	Maintenance IVF \times duration of case
Third-space and insensible losses	1-3 mL/kg per hr for minor procedure (small incision) 3-7 mL/kg per hr for moderate procedure (medium incision) 9-11 mL/kg per hr for extensive procedure (large incision)
Blood loss	1 mL blood or colloid per 1 mL blood loss, or 3 mL crystalloid per 1 mL blood loss

IVF, intravenous fluids.

Estimation of intraoperative fluid loss and guide for replacement

Washington Manual of Surgery

3rd Edition © 2002 **Table 4-3.**

[Hint Number 49]

Choice of Local Anesthetic

One question on the oral boards that sometimes arises concerns the choice of local anesthetic for a particular procedure. The information below nicely summarizes the discussion.

Agent	Maximum dose (mg/kg)		Length of action (h)	
	Plain	With epinephrine*	Plain	With epinephrine*
Procaine	—	8.0	0.25–1.0	0.5–1.5
Lidocaine	5.0	7.0	0.5–1.0	2–6
Mepivacaine	5.0	7.0	0.75–1.5	2–6
Bupivacaine	2.5	3.0	2–4	3–7
Tetracaine	1.5	—	2–4	—

*1:200,000.

Local anesthetics for infiltration

Washington Manual of Surgery

3rd Edition © 2002 **Table 6-1.**

[Hint Number 50]

Sedation

One question on the oral boards that sometimes arises concerns the level of sedation that one obtains with sedative agents. The information below nicely summarizes the Ramsay sedation scale – a popular scale used to succinctly describe a patient’s level of sedation for use with MAC cases and for use in the ICU.

Score	Characteristics
1	Anxious and agitated or restless, or both
2	Cooperative, oriented, and tranquil
3	Responding to commands only
4	Asleep, but responds to physical or auditory stimuli
5	Asleep, but responds sluggishly to physical or auditory stimuli
6	No response

Modified Ramsay Sedation Scale

Washington Manual of Surgery

3rd Edition © 2002 **Table 11-1.**

[Hint Number 51]

Mechanical Ventilation

One question on the oral boards that sometimes arises concerns the various types of mechanical ventilation that may be used in the operating room and the ICU. The information below nicely summarizes the discussion.

Ventilator mode	Initiated	Advantages	Disadvantages	Indications
Volume limited				
Assist-control ventilation	Pressure	Requires little patient effort	Full ventilatory support only; respiratory alkalosis common in agitated patients; uncomfortable	Unstable patient with poor respiratory effort
Synchronized intermittent mandatory ventilation	Pressure	Allows SB/PVS; less hyperventilation and respiratory alkalosis; more comfortable; no breath "stacking"	Increased work of breathing (demand valve systems) during unassisted breaths	Best for awake patient and during weaning
Pressure limited				
Pressure-support ventilation	Pressure	Allows SB/PVS; decreased peak airway pressure, increased mean airway pressure	Smaller tidal volumes may lead to atelectasis	Useful during weaning
Pressure-control ventilation	Time	Same as pressure-support	No SB/PVS; often requires sedation	Severe adult respiratory distress syndrome

PVS, partial ventilatory support; SB, spontaneous breathing.

Modes of ventilation

Washington Manual of Surgery

3rd Edition © 2002 Table 11-4.

[Hint Number 52]

Vasoactive Drugs

One question on the oral boards that sometimes arises concerns the various types of vasoactive ventilation that may be used in the operating room and the ICU. The information below nicely summarizes the discussion.

Class and drug	Blood pressure	Systemic vascular resistance	Cardiac output	Heart rate	Inotrope		Renal blood flow	Coronary blood flow	MvO ₂
					Low-dose	High-dose			
Alpha only									
Phenylephrine	↑↑↑	↑↑↑↑	↓↓↓	↓↓↓	±	±	↓↓↓↓	±↑↑	↑
Alpha and beta									
Norepinephrine	↑↑	↑↑↑	↓↓	↓↓±	↑	↑	↓↓↓↓	↑↑	↑↑
Epinephrine	↑±	↑±	↑↑	↑↑↑	↑↑	↑↑↑	↓±	↑↑	↑↑↑
Dopamine	↑↑	↑↑	↑↑	↑	±	↑↑	↑↑↑	↑↑	↑↑
Beta only									
Isoproterenol	↑±	↓↓	↑↑↑↑	↑↑↑↑	↑↑↑	↑↑↑↑	±	↑↑↑	↑↑↑↑
Dobutamine	↓↓	↓↓↓	↑↑↑	↑↑	↑↑↑	↑↑↑	±	↑↑↑	↑↑↑
Beta-blocker									
Propranolol	±↓	±	↓↓↓	↓↓↓↓	↓↓	↓↓↓	↓	↓↓	↓↓↓
Metoprolol	↓↓↓	↓	↓↓	↓↓↓	↓↓	↓↓↓	±	↓↓	↓↓
Other									
Nitroglycerine	±↓	↓↓	↑↑	±	±	±	±↑	↓	↓↓
Hydralazine	↓↓↓	↓↓↓	↑↑	↑↑	±	±	±↑	↓	↓↓
Prazosin	↓↓↓	↓↓	↑↑	±	±	±	±↑	↓	↓↓
Nitroprusside	↓↓	↓↓↓	↑↑↑	±↑	±	±	↑↑	±	↓↓

MvO₂, mixed venous oxygen saturation.

Vasoactive drugs and their specific actions

Washington Manual of Surgery

3rd Edition © 2002 **Table 11-7.**

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[Hint Number 53]

GASNet

GASNet is a comprehensive anesthesia information resource for anesthesiology professionals worldwide. It can be accessed at <http://gasnet.org/>

Here are some sample offerings:

- ACC - AHA Guidelines
- Disaster Management Links
- Single Lung Ventilation in Children
- Wire-Guided Endobronchial Blockers
- Global Textbook of Anesthesiology, 2nd Edition
- Management of the Difficult Airway
- Pediatric Syndromes
- Anesthesia for the Intoxicated Patient
- Navigating the Citation of electronic Information
- Hemodynamic optimization
- Transesophageal Echocardiography Tutorial
- Fundamentals of Acid - Base Balance
- Anesthesia Information Management Systems
- Anesthesia in the MRI Suite

[Hints 54-67]

Practice Parameters

The ASA publishes a number of “Practice Parameters” (clinical guidelines) that you should be aware of. They are available online at

<http://www.asahq.org/publicationsServices.htm>

Here is a list of the available publications:

- Practice Advisory for the Perioperative Management of Patients with Cardiac Rhythm Management Devices: Pacemakers and Implantable Cardioverter-Defibrillators **[Hint 54]**
- Practice Advisory for the Prevention of Perioperative Peripheral Neuropathies **[Hint 55]**
- Practice Advisory for Preanesthesia Evaluation **[Hint 56]**
- Practice Guidelines for Acute Pain Management in the Perioperative Setting **[Hint 57]**
- Practice Guidelines for Blood Component Therapy **[Hint 58]**
- Practice Guidelines for Cancer Pain Management **[Hint 59]**
- Practice Guidelines for Chronic Pain Management **[Hint 60]**
- Practice Guidelines for Management of the Difficult Airway **[Hint 61]**
- Practice Guidelines for Obstetrical Anesthesia **[Hint 62]**
- Practice Guidelines for Perioperative Transesophageal Echocardiography **[Hint 63]**
- Practice Guidelines for Postanesthetic Care **[Hint 64]**

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- Practice Guidelines for Preoperative Fasting ***[Hint 65]***
 - Practice Guidelines for Pulmonary Artery Catheterization ***[Hint 66]***
 - Practice Guidelines for Sedation and Analgesia by Non-Anesthesiologists ***[Hint 67]***
-

[Hint Number 68]

Another Useful Educational Resource

Anesthesiology News offers a number of free educational resources of potential interest to individuals studying for their boards. The web address is **www.cmezone.com**. These resources can also be completed for CME credit.

Here are some of the modules offered:

- Alpha2 Adrenergic Agonists As Adjuncts to Anesthesia In the Perioperative Setting
 - Anaphylactic and Anaphylactoid Reactions During Anesthesia
 - Antiemetic Drugs in the Prevention and Treatment of Postoperative Vomiting in Children
 - Cardioprotection in Cardiac Surgery
 - Current Issues and New Approaches to Postoperative Pain Management: Focus on Epidural Analgesia
-

[Hint Number 69]

Audio Digest Anesthesiology

The Audio Digest Foundation provides a number of excellent audio lectures relating to anesthesia in both tape and CD format. While these cost real money, the synopses of these outstanding presentations are freely available online at no charge. Their web site is at <http://www.audio-digest.org>

Here are some sample topics:

- OBESITY, SLEEP APNEA, THE AIRWAY, AND ANESTHESIA
REGIONAL ANESTHESIA
- DEPTH-OF-ANESTHESIA MONITORING
- COMPLICATIONS WITH PATIENT POSITIONING
- MALIGNANT HYPERTHERMIA
- MALPRACTICE LAWSUITS: AN ATTORNEY'S PERSPECTIVE
- OBSTETRIC EMERGENCIES
- THE COCAINE-ABUSING PARTURIENT
- SEVERE HYPERTENSION
(see synopsis provided below)
- DIAGNOSIS AND TREATMENT OF COMMON BLEEDING DISORDERS
(see synopsis provided below)

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SEVERE HYPERTENSION—Robert N. Sladen, MD, Professor and Vice Chair, Department of Anesthesiology, and Director, Cardiothoracic-Surgical Intensive Care Unit, Columbia University College of Physicians & Surgeons, New York City

Incidence: in United States, approximately 40 million people with hypertension; approximately 25% treated and controlled, approximately 28% treated but poorly controlled, and approximately 50% untreated or undiagnosed

Key questions: does inadequate control of hypertension result in complications that could be prevented with some control? answer unknown; only group of patients with evidence that intraoperative control of blood pressure (BP) improves postoperative outcome are patients undergoing carotid endarterectomy; long-term end organ damage to brain, heart, and kidneys directly proportional to BP (impact of short-term perioperative hypertension unknown); how much control of BP needed, and for how long? specific answers unknown; clinical guidelines and common sense guidelines available, but not much data

Important points: look for cause of hypertension (may not be due to vasoconstriction); BP varies depending on where measurement taken; arteries stiffen with age, pulse pressure widens, and BP becomes exaggerated; look for “fling” in hyperdynamic patient; cuff pressure may be better for therapeutic endpoint, even though beat-to-beat monitoring necessary

Types of hypertension: diastolic hypertension defined as diastolic BP (DBP) >90 mm Hg (traditionally, surgery canceled at DBP >110 mm Hg); systolic hypertension defined as systolic BP (SBP) >140 mm Hg and DBP >90 mm Hg; isolated systolic hypertension (ISH) defined as SBP >140 mm Hg, DBP <90 mm Hg, and elevated pulse pressure >70 mm Hg; increasing evidence that ISH (increasingly prevalent with age) and widened pulse pressure important predictors of adverse perioperative events and outcome; ISH reflects decreased arterial distensibility in presence of retained stroke volume and rate of systolic ejection; promotes left ventricular hypertrophy (LVH) and increased risk for adverse cardiac events and potentially adverse perioperative outcome

Vasodilators: balanced vasodilators (*eg*, nitroprusside, natriuretic peptides) have equal effect on venous and arterial systems; arterial dilators include hydralazine, angiotensin-converting enzyme (ACE) inhibitors, and dihydropyridine calcium-channel blockers; arterial dilators decrease afterload without decreasing preload; vasodilators decrease afterload and preload; if titrated carefully, nitroglycerin acts predominantly on venodilation (not as useful for acute BP management as for pulmonary congestion; keep aortic DBP high as possible and left ventricular DBP low as possible)

Transmyocardial gradient: pure arterial dilator used in acute ischemic syndrome may worsen coronary perfusion pressure (CPP); combine hydralazine with beta-blocker to blunt reflex tachycardia and other adverse effects; nitroprusside decreases aortic DBP and left ventricular DBP; nitroglycerin selectively decreases left ventricular DBP without affecting aortic DBP and thereby improves CPP; background

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nitroglycerin in combination with reduced BP negates beneficial effects of nitroglycerin; obtain benefits of nitroglycerin by decreasing dosage or giving fluid to increase BP

Hyperdynamic response: be aware of potential danger of giving pure vasodilators to patient emerging from anesthesia (increasing catecholamines); suddenly stopping nitroprusside leads to rebound hypertension; gently adding beta-blocker may prevent problem; older patients more sensitive to action of nitroprusside

Beta-blockers: long-acting, intermediate-acting, or short-acting, and beta₁ selective or beta₁ nonselective; combination nitroprusside and esmolol infusions useful in severely hypertensive patients; combination decreases dose requirement of either drug; prevents reflex tachycardia and effects of myocardial depression; important to maintain perioperative beta-blockade; labetalol nonselective, has alpha-blocking properties, and relatively weak; all beta-blockade competitive (wise to use small dose of drug, *eg*, labetalol, in OR); heart rate (HR) decrease seen before drop in BP (titrate cautiously to effect)

ACE inhibitors: ACE produces vasoconstriction and sodium retention; blocked by ACE inhibitors or angiotensin II receptor blockers; available in long-acting, intermediate-acting, or short-acting preparations; majority of patients receive long-acting ACE inhibitors (*eg*, lisinopril); potential concerns include renal function; studies show improvement in renal function with use of ACE inhibitors to normalize BP

Calcium channel blockers: widely disparate in chemical structure; agents in chemically dissimilar groups include dihydropyridines, diltiazem, and verapamil; primary actions include negative inotropic effect, atrioventricular blockade, and vasodilation; nifedipine water-soluble light-insensitive derivative of nifedipine and can be given by continuous infusion; new short-acting agent, clevidipine, currently undergoing clinical trials (predictable dose response; metabolized in blood by nonspecific esterases; rapid clearance)

Dopaminergic agonists: include fenoldopam; does not have beta or alpha effects of dopamine; increasing dose of fenoldopam causes increase in renal blood flow; fenoldopam much less predictable than nitroprusside and nicardipine; expensive; attention turned to effects on renal protection rather than BP control

Alpha₂-agonists: cause sedation, anxiolysis, and sympatholysis in brain; modulate analgesic effects in spinal cord; direct vasoconstricting action in peripheral vasculature; dexmedetomidine decreases HR and BP

Natriuretic peptides: “exorbitantly expensive,” but already in use by cardiologists; types include atrial natriuretic peptide (A-type), B-type (released by ventricles and atria), and C-type (released from vasculature); suppress renin angiotensin and norepinephrine and promote diuresis; nesiritide approved by Food and Drug Administration (FDA) for treatment of acute congestive heart failure and pulmonary edema

DIAGNOSIS AND TREATMENT OF COMMON BLEEDING DISORDERS

Charise T. Petrovitch, MD, Chair, Department of Anesthesiology, Providence Hospital, Washington, DC

Preoperative evaluation: screening laboratory tests no longer ordered; instead, obtain relevant clinical history and inquire about medical conditions that may involve bleeding disorder; inquire about previous major surgeries and need for blood transfusion (hereditary bleeding disorder unlikely if blood transfusion not required during major surgery); acknowledgment of bleeding disorder or history suggestive of bleeding disorder requires characterization to determine whether it involves primary hemostasis (blood vessels and platelets) or clotting factors

Primary hemostasis: presents with bruises and petechiae (superficial bleeding); patient may complain of mucosal bleeding (*eg*, nosebleed, menorrhagia, gastrointestinal [GI] bleeding, hematuria)

Clotting factor disorder: *eg*, hemophilia; patients do not present with much bruising and petechiae, but with deeper tissue bleeding (*eg*, joints, resulting in hemarthroses)

Acquired thrombocytopenia: most common causes include inadequate platelet production in bone marrow (*eg*, resulting from chemotherapy or radiation therapy), splenomegaly, massive tissue injury (platelet consumption occurs with large areas of denuded endothelium and with diseases that produce generalized vasculitis [*eg*, preeclampsia of pregnancy]), dilution from massive transfusion (administration of lactated Ringer's solution, normal saline, or hetastarch dilutes platelet count), and immune mechanisms that destroy platelets (*eg*, heparin-induced thrombocytopenia)

Hereditary platelet disorder: von Willebrand's disease most common hereditary bleeding disorder; case history; may appear as platelet dysfunction or as hemophilia

Acquired platelet dysfunction: *uremia*—produces platelet defect; thought to be caused by accumulation of toxic metabolites that reduce platelet aggregation; dialysis provides temporary benefit; desmopressin (DDAVP) also improves platelet function prior to surgery; *alcoholism*—long-term alcohol consumption leads to platelet dysfunction; *antiplatelet agents*—aspirin most common, inhibits synthesis of thromboxane A₂ for life of platelet; many other drugs inhibit platelet function (*eg*, clopidogrel [Plavix]); *fibrin degradation products (FDPs)*—increased by disseminated intravascular coagulation (DIC), fibrinolytic therapy, or severe liver disease; coat surface of platelet and inhibit platelet aggregation, leading to defect of primary hemostasis

Clotting factor disorders

Acquired disorders: *alcoholism and liver disease*—lead to complex coagulopathy; reduction seen in clotting factors and plasminogen (leads to fibrinolysis); difficult for patient recover from bleeding disorder; treat early and do “not be quite as stingy as you

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might be with other people who have a good liver”; *vitamin K deficiency*—vitamin K consumed in diet from leafy green vegetables; deficiency occurs after 7 to 10 days without adequate intake; fat-soluble vitamin; bile secretion helps in absorption; sterilization of gut with antibiotic therapy may lead to vitamin K deficiency; coumadin therapy also depletes vitamin K-dependent clotting factors (factors II, VII, IX, and X); *response to vitamin K therapy*—takes minimum of 6 hr to begin synthesis of deficient factors; 2 days to replete vitamin K-dependent factors; *massive transfusion*—no clotting factors in colloid, hetastarch, albumin, or lactated Ringer’s solution; factor dilution (fibrinogen, factors V and VIII) disrupts coagulation first; other causes include DIC, factor dilution, aspirin therapy, and hemostatic abnormality

Disseminated intravascular coagulation: many conditions predispose to DIC, including sepsis, shock, burns, and acidosis; predisposing condition leads to tissue injury or damage to endothelium; blood exposed to tissue factor; inciting tissue factor results from injury to endothelium or exposure of blood to tissue thromboplastin (by release of tissue factor into blood stream; entire bloodstream exposed to phospholipid); DIC stimulates fibrinolysis as defense mechanism to lyse blood clots and maintain blood flow (high levels of thrombin and plasmin in bloodstream); if FDPs produced at rate faster than they can be cleared from circulation, they begin to accumulate and become powerful anticoagulant; accumulation of FDPs inhibits crosslinking of fibrin strands and coats surface of platelet; primary hemostasis breaks down; patient once clotting throughout bloodstream begins to bleed; elimination of FDPs necessary to halt bleeding; control phospholipids to defend endothelium against DIC (“not always easy”); blood flow, if compromised, should be improved to increase liver perfusion and to dilute factors; avoid aminocaproic acid (Amicar), tranexamic acid, and aprotinin

Intraoperative evaluation: distinguish surgical bleeding from faulty hemostatic mechanism (surgeon most common cause of bleeding; requires suturing, not fresh frozen plasma [FFP] or platelets); look for clotting in operative field; order coagulation studies; look at causes of clinical coagulopathy that patient may develop (*eg*, massive transfusion [dilutes platelets and factors, or leads to transfusion reaction], DIC [caused by sepsis, placental abruption, fetal death in utero]); order platelets when $<150,000/\mu\text{L}$; prothrombin time (PT) and partial thromboplastin time (PTT) not reliable as predictors of bleeding; difficult to “catch up” with FFP alone when fibrinogen drops to $<100\text{ mg/dL}$ (switch to cryoprecipitate)

[Hint Number 70]

Be familiar with the key anesthesiology papers

Example: Reinfarction rate following anesthesia and surgery in patients with a recent myocardial infarction.

Example: Mortality and morbidity in regional versus general anesthesia

Make your own list of the top 10 or so key anesthesiology papers and be familiar with them.

[Hint Number 71]

Be familiar with various controversial issues

EXAMPLE 1

Epidural or spinal anesthesia in patients with a known difficult airway. If things go badly wrong and the patient needs to be intubated, what will you do then?

EXAMPLE 2

Use of the LMA ProSeal and positive pressure ventilation for abdominal surgical procedures.

EXAMPLE 3

Hyperventilation in the head-injured patient.

EXAMPLE 4

Use of steroids in the head-injured patient.

EXAMPLE 5

Allowing clear fluids up until two hours prior to surgery

See Anesthesiology 90:896-905, 1999

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[Hint Number 72] (Contributed by Dr. Walter Mauer)

You should be familiar with the following guidelines and the definitions used concerning sedation and analgesia by nonanesthesiologists:

American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice guidelines for sedation and analgesia by non-anesthesiologists. *Anesthesiology*. 2002 Apr;96(4):1004-17.

Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia

	Minimal Sedation (Anxiolysis)	Moderate Sedation/Analgesia (Conscious Sedation)	Deep Sedation/Analgesia	General Anesthesia
Responsiveness	Normal response to verbal stimulation	Purposeful [±] response to verbal or tactile stimulation	Purposeful [±] response after repeated or painful stimulation	Unarousable, even with painful stimulus
Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
Spontaneous ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular function	Unaffected	Usually maintained	Usually maintained	May be impaired

Minimal Sedation (Anxiolysis) = a drug-induced state during which patients respond normally to verbal commands. Although cognitive function and coordination may be impaired, ventilatory and cardiovascular functions are unaffected.

Moderate Sedation/Analgesia (Conscious Sedation) = a drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular

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function is usually maintained.

Deep Sedation/Analgesia = a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.

General Anesthesia = a drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired.

Because sedation is a continuum, it is not always possible to predict how an individual patient will respond. Hence, practitioners intending to produce a given level of sedation should be able to rescue patients whose level of sedation becomes deeper than initially intended. Individuals administering *Moderate Sedation/Analgesia (Conscious Sedation)* should be able to rescue patients who enter a state of *Deep Sedation/Analgesia*, while those administering *Deep Sedation/Analgesia* should be able to rescue patients who enter a state of general anesthesia. *(Developed by the American Society of Anesthesiologists; approved by the ASA House of Delegates October 13, 1999.)*

* Reflex withdrawal from a painful stimulus is not considered a purposeful response.

[Hint Number 73] *(Contributed by Dr. Victor Ryckman)*

A Must READ...The last 5 yrs. of ASA Peer Reviewed
"Refresher Courses in Anesthesiology"...Published
by Lippincott

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[Hint Number 74] *(Contributed by Dr. Michael Ritchey)*

Try to stick with your gameplan for approaching oral board stem questions. Don't let your anxiety or perceived lack of time throw you off of this plan. A typical gameplan would break up the question into preoperative, intraoperative, and postoperative periods. Practice making a gameplan.

[Hint Number 75] *(Contributed by Dr. Michael Ritchey)*

For any change in patient status, make sure that you ascertain vital signs, level of consciousness, peripheral arterial oxygen saturation, and patency of the airway. This is easy to forget during the grab bag questions when you are asked something like, "You are called to see a patient in PACU with a BP of 204/99, what do you want to do?"

[Hint Number 76] *(Contributed by Dr. Michael Ritchey)*

Try not to get trapped into using medications or techniques that you are not familiar with. You may be embarrassed when asked a dosage or a potential complication. You may say something like, "this medication would be indicated in this situation, but I would have to review its dosing information in the PDR".

[Hint Number 77] *(Contributed by Dr. Michael Ritchey)*

Tape record yourself answering some hypothetical oral board questions to see if you use an excessive amount of vocalized pauses such as "Uh" and "Umm". If so, try to train yourself to minimize this response. It weakens the strength of your responses.

[Hint Number 78]

Dress conservatively for the examination. Very conservatively.
That means no nose rings.

[Hint Number 79]

Never show cockiness or excessive confidence. This is simply
an invitation to get asked a very difficult question to put you back
in your place. Try to maintain a stance of graceful confidence.

[Hint Number 80]

Bluffing on an examination can be very dangerous. Even
deadly. Do not get caught on a bluff that causes your examiners
to lose confidence in you.

[Hint Number 81]

Get a good night's sleep the night before.

[Hint Number 82]

And no alcohol the evening before either.

[Hint Number 83]

Arrange for a wakeup call the night before.

No show = no pass.

[Hint Number 84]

Planning on using an epidural for your case?

Then remember this advice from Miller (6th Edition)

“The benefits of postoperative epidural analgesia are optimized when the epidural catheter is inserted in a location corresponding to the dermatomes covered by the surgical incision (i.e., catheter-incision congruent analgesia), resulting in a lower dose of drug administered and decreased incidence of drug-induced side effects, such as pruritus, nausea, vomiting, urinary retention, motor block, and hypotension.”

“Maximal attenuation of perioperative pathophysiology occurs with use of a local anesthetic-based epidural analgesic solution. The use of a local anesthetic-based (versus opioid-based) analgesic solution is associated with an earlier recovery of gastrointestinal motility after abdominal surgery and less frequent occurrence of pulmonary complications.”

“Epidural analgesia is not a generic entity because different catheter locations and analgesic regimens may differentially affect perioperative morbidity.”

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[Hint Number 85]

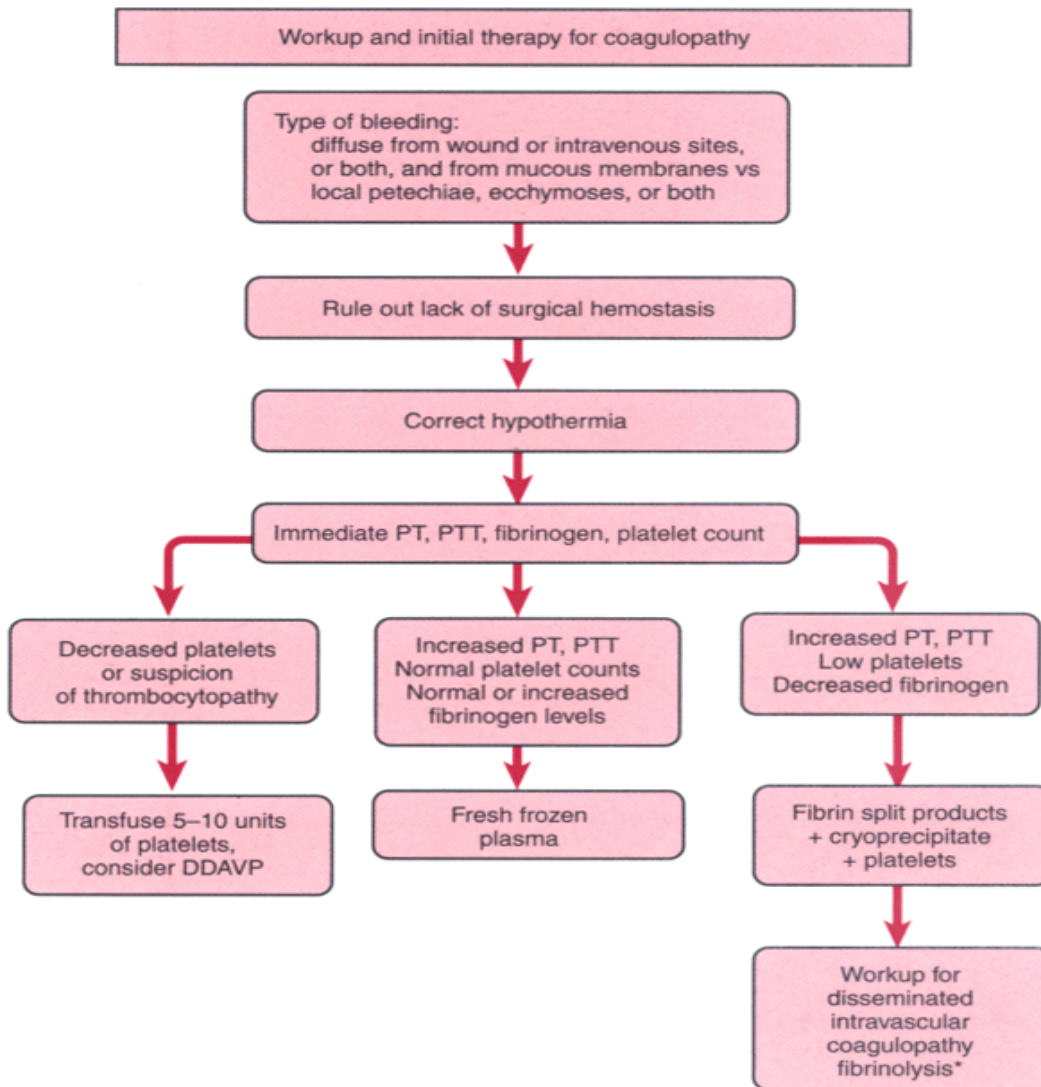
If you get a trauma question, there is a good chance you will get some bleeding. Be sure to be familiar with the American College of Surgeons' classes of acute hemorrhage, nicely summarized below. (Source Miller, 6th Edition, Table 47-1)

American College of Surgeons' classes of acute hemorrhage				
Factors	Class I	Class II	Class III	Class IV
Blood loss (mL)	750	750–1500	1500–2000	2000 or more
Blood loss (% blood volume)	15	15–30	30–40	40 or more
Pulse (beats/min)	100	100	120	140 or higher
Blood pressure	Normal	Normal	Decreased	Decreased
Pulse pressure (mm Hg)	Normal or increased	Decreased	Decreased	Decreased
Capillary refill test	Normal	Positive	Positive	Positive
Respirations per minute	14–20	20–30	30–40	35
Urine output (mL/hr)	30	20–30	5–10	Negligible
Central nervous system: mental status	Slightly anxious	Mildly anxious	Anxious, confused	Confused, lethargic
Fluid replacement (3-1 rule)	Crystalloid	Crystalloid	Crystalloid + blood	Crystalloid + blood

[Hint Number 86]

Perioperative coagulopathy problems are a pain in the oral exam and in the real world. Here are some hints on their management (Miller, 6th Edition, Figure 47-7).

Algorithm of the evaluation and initial therapy of a patient with suspected perioperative coagulopathy. The evaluation is based on the clinical scenario and is affected by the type and location of injury, the amount of fluid administered, and the age and body temperature of the patient. DDAVP, 1-deamino-8-D-arginine vasopressin, a vasopressin analog also known as desmopressin acetate; PT, prothrombin time; PTT, partial thromboplastin time. (Adapted from Habibi S, Corrsin DB, McDermott JC, et al: *Trauma and massive hemorrhage*. In Muravchick S, Miller RD (eds): *Atlas of Anesthesia: Subspecialty Care*. New York, Churchill Livingstone, 1998, pp 6.2–6.17.)



[Hint Number 87]

CLASSIC PAPERS TO KNOW ABOUT

Goldman L, Caldera DL, Nussbaum SR, et al: Multifactorial index of cardiac risk in noncardiac surgical procedures. N Engl J Med 297:845, 1977

From Miller, 6th Ed: “One of the earliest attempts to define cardiac risk was performed by Goldman and colleagues at the Massachusetts General Hospital. They studied 1001 patients older than 45 years who were undergoing noncardiac surgery, excluding patients who underwent transurethral resection of the prostate under spinal anesthesia. Using multivariate logistic regression, they demonstrated nine clinical factors associated with increased morbidity and mortality. Each of these risk factors was associated with a given weight in the logistic regression equation, which was converted into points in the index. An increasing number of points was associated with increasing perioperative cardiac morbidity or mortality.”

Goldman Cardiac Risk factors

(from <http://www.frca.co.uk/article.aspx?articleid=100187>)

Nine independent risk factors are evaluated on a point scale:

- Third heart sound (S3) 11 points
- Elevated jugulovenous pressure 11 points
- Myocardial infarction in past 6 months 10 points
- ECG: premature arterial contractions or any rhythm other than sinus 7 points
- ECG shows >5 premature ventricular contractions per minute 7 points
- Age >70 years 5 points
- Emergency procedure 4 points
- Intra-thoracic, intra-abdominal or aortic surgery 3 points
- Poor general status, metabolic or bedridden 3 points

Patients with scores >25 had a 56% incidence of death, with a 22% incidence of severe cardiovascular complications.

Patients with scores <26 had a 4% incidence of death, with a 17% incidence of severe cardiovascular complications.

Patients with scores <6 had a 0.2% incidence of death, with a 0.7% incidence of severe cardiovascular complications.

[Hint Number 88]

CLASSIC PAPERS TO KNOW ABOUT

Rao TLK, Jacobs KH, El-Etr AA: Reinfarction following anesthesia in patients with myocardial infarction. *Anesthesiology* 59:499, 1983.

“The authors studied the incidence of and factors related to recurrent perioperative myocardial infarction retrospectively during 1973-1976 (Group 1) and prospectively during 1977-1982 (Group 2). Reinfarction occurred in 28 of 364 (7.7%) patients in Group 1 and 14 of 733 (1.9%) in Group 2 (P less than 0.005). When the previous infarction was 0-3 and 4-6 months old, perioperative reinfarction occurred in 36% and 26% of Group 1 patients, respectively, and only 5.7% and 2.3% of Group 2 patients, respectively, (P less than 0.05). In both groups, patients with associated congestive heart failure had a higher reinfarction rate. Patients who had intraoperative hypertension and tachycardia or hypotension develop had a higher incidence of reinfarction in both groups. The results suggest that preoperative optimization of the patient's status, aggressive invasive monitoring of the hemodynamic status, and prompt treatment of any hemodynamic aberration may be associated with decreased perioperative morbidity and mortality in patients with previous myocardial infarction. Which of these factors, if any, contributed to the improved outcome was not determined in this study.” (*from www.manbit.com/PAC/chapters/P32.cfm*)

[Hint Number 89]

CLASSIC PAPERS TO KNOW ABOUT

Detsky A, Abrams H, McLaughlin J, et al: Predicting cardiac complications in patients undergoing non-cardiac surgery. J Gen Intern Med 1:211, 1986.

From Miller, 6th Ed: “Detsky and coworkers studied a cohort of individuals who were referred to an internal medicine service for preoperative evaluation. Many of the factors identified by Goldman were confirmed or slightly modified in the Detsky index, and angina was added to the risk factors. The researchers advocated the calculation of a pretest probability of complication based on the type of surgery, after which the Detsky Modified Risk Index is applied with the use of a nomogram. In this manner, the overall probability of complications can be determined as a function of the surgical procedure and of patient disease. The Detsky index was advocated as the starting point for risk stratification in the American College of Physicians Guideline on preoperative evaluation.”

[Hint Number 90]

CLASSIC PAPERS TO KNOW ABOUT

Eagle KA, Coley CM, Newell JB, et al: Combining clinical and thallium data optimizes preoperative assessment of cardiac risk before major vascular surgery. Ann Int Med 110:859, 1989.

From Miller, 6th Ed: “Eagle and colleagues determined the value of clinical risk factors for predicting perioperative cardiac events and the additive value of noninvasive testing based on the preoperative risk profile. Five clinical predictors were identified: age older than 70 years, diabetes mellitus, angina, ventricular ectopic activity being treated, and Q waves on an electrocardiogram. Among patients undergoing major vascular surgery, an increasing number of clinical variables was associated with an increasing perioperative risk. The presence of thallium redistribution after dipyridamole infusion further identified a high-risk cohort among patients with one or two clinical risk factors.”

[Hint Number 91]

CLASSIC PAPERS TO KNOW ABOUT

Eagle K, Brundage B, Chaitman B, et al: Guidelines for perioperative cardiovascular evaluation of the noncardiac surgery. A report of the American Heart Association/American College of Cardiology Task Force on Assessment of Diagnostic and Therapeutic Cardiovascular Procedures. Circulation 93:1278, 1996.

KEY MESSAGE

From Miller, 6th Ed: “Patients who have had a myocardial infarction within less than 30 days should be considered the group at highest risk; after that period, risk stratification is based on disease severity and exercise tolerance”

[Hint Number 92]

CLASSIC PAPERS TO KNOW ABOUT

Rodgers A, Walker N, Schug S, et al: Reduction of postoperative mortality and morbidity with epidural or spinal anaesthesia: Results from overview of randomised trials. BMJ 321:1493, 2000.

KEY MESSAGE

Modified from Miller, 6th Ed:

This meta-analysis of randomized data (141 trials enrolling 9559 subjects) demonstrated that perioperative use of neuraxial anesthesia and analgesia (versus general anesthesia and systemic opioids) reduced overall mortality by approximately 30%. Use of perioperative epidural anesthesia and analgesia, especially with a local anesthetic-based analgesic solution, can attenuate the pathophysiologic response to surgery and may be associated with a reduction in mortality and morbidity compared with analgesia with systemic (opioid) agents. Use of epidural analgesia can also decrease the incidence of postoperative gastrointestinal, pulmonary, and possibly cardiac complications.

[Hint Number 93]

Here is a nice free textbook on regional anesthesia for obstetrics.

Hypertextbook of Regional Anaesthesia for Obstetrics.

<http://www.manbit.com/oa/oaindex.htm>

Of particular interest here is information on how to do a C-section anesthetic using infiltration anesthesia (a useful option in some nightmare scenarios likely to arise in the oral examination). (See the article online at <http://www.manbit.com/oa/oaindex.htm>). A sampling from the site:

Local anaesthetic infiltration for caesarean section (CS) is a rarely used technique. It has application in the rare situation where both general and regional anaesthesia is contraindicated and in countries with limited health resources. There are few contemporary reports of this technique and most descriptions come from countries where:

1. anaesthetic expertise is lacking, or limited,
2. anaesthetic equipment or gas supplies are unavailable, or
3. a single individual is required to both operate and anaesthetise.

[Hint Number 94] “St. George MCQ” Educational Resource

This hint applies primarily to candidates preparing for the written examination, but is important enough that it should be mentioned.

The “St. George MCQ” (see menu below) is an educational resource consisting of over a 1000 type 'A' (5 Part) and type 'K' (4 Part) multiple choice anesthesia questions and includes: ECGs, X-rays, 'live' echocardiograms etc. The MCQ is fully referenced, and many of the questions are keyword-linked to the 'Medline' database and some are also linked to other educational websites around the world. It can be accessed at: <http://www.manbit.com/mcq/mcqinit.asp>

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[Hint Number 95] AnaesthesiaUK.com

AnaesthesiaUK.com is a medical education Web site providing training resources for anesthesia professionals, especially for English-speaking trainees in Europe. Although the focus is on the UK Primary FRCA, UK Final FRCA and the Irish FCARCSI examinations, the site provides didactic articles and practice questions that individuals in all countries will find useful.

In the "Journal Alerting" section of the site one can view summaries of selected recent papers. In most cases, a PubMed (MEDLINE) link to the article is also provided.

In the "Clinical" section of the site one can view brief didactic summaries on a large variety of clinical topics. Some of the materials offered are animations, such as Flash animations of gas flow occurring in anesthesia breathing circuits.

The "Exams" section provides resources specifically directed at FRCA and FCARCSI examination candidates. Nevertheless, these will be of considerable value to examination candidates anywhere in the world.

Other sections include a discussion forum, information on anesthesia books, resources for handheld computer users, information on getting a job, a site map, and much more.

[Hint Number 96] www.capnography.com

This Web site is an unparalleled educational resource on the topic of capnography. It is vast and comprehensive, covering almost every imaginable aspect of the topic. The site is authored by Bhavani Shankar Kodali, M.D.. The author dedicates the site "to enhancing the safety of patient care, inside as well as outside of the operating rooms" and emphasizes that "capnography is much more than simply checking the position of endotracheal tube." As such, it is his goal that this effort "not only addresses the basic principles but also be a forum for active discussion on issues related to capnography in all medical fields."

What makes this site particularly special is the use of animated graphical techniques to assist in the understanding of capnographic concepts. These animations show capnographic tracings moving across the computer screen as they do in real life, with special areas of interest highlighted and labeled for easy comprehension. This makes this Web resource far more valuable than an ordinary textbook.

The site includes many sections. The section "ASA Guidelines" discusses clinical standards pertaining to capnographic monitoring. Another section "Why Capnography?" discusses terminology, definitions, physics, physiology, and clinical matters. An atlas of capnograms is also provided, as well as a quiz section for personal knowledge testing. Other sections include: clinical tips, frequently asked questions, and discussions on capnography concerning pediatrics, laparoscopic surgery, thoracic surgery, and intensive care medicine. Links to other capnography sites (e.g., www.capnography.net) are also provided.

[Hint Number 97] "The Virtual Anesthesia Machine"

www.anest.ufl.edu/vam

Anesthesia machines have evolved from simple, non-electronic pneumatic systems to fully integrated anesthesia delivery systems based on sophisticated computer technology using advanced electronic sensors. While three decades ago, a rudimentary background in pneumatics and fluidics sufficed to understand how anesthesia machines function, this is no longer the case. Today an understanding of pneumatics, analogue and digital electronics, computer software technology, and human factors engineering is necessary to fully understand the operations of latest generation integrated anesthesia delivery systems. Since an understanding of modern anesthesia machines has become essential to the safe practice of modern clinical anesthesia, anesthesiologists must tackle the often-painful process of learning about the inner workings of anesthesia machines if they are to practice safely. (For instance, anesthesiologists should be aware of the various design differences among manufacturers that impact on how preoperative machine checks are carried out). Traditionally, students learn how anesthesia machines work by attending lectures and looking at static illustrations in textbooks and journal articles. However, the important dimensions of time and interactivity are necessarily missing in such settings, impairing the learning experience.

Fortunately, there is help. The Virtual Anesthesia Machine (VAM) is a Web-based, interactive, computer simulation of an anesthesia machine aimed at educating medical students, residents and others on the inner complexities of the anesthesia machine.

Available on the Web at <http://www.anest.ufl.edu/vam>, VAM simulates the inner

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operations of a typical anesthesia machine and ventilator using the (free) Shockwave Web player. The result is a "transparent mental model" of a typical modern anesthesia machine that is accurate, easy to understand, readily accessible, and free to use. Users of the package can interactively experiment to learn (for instance) how adjustments of anesthesia machine controls affect (animated) gas flow throughout the machine or how various anesthesia machine failure modes affect performance. Thus users can observe the effects of flow of gas through the CO₂ absorber or the operation of safety features like the O₂ failsafe system. The result is that students obtain a complete understanding of the patterns of gas flow within the system and thus understand the consequences of user actions or machine malfunctions on gas pressures, flows, and composition.

The VAM project is coordinated by Sem Lampotang, Ph.D., and involves a team of biomedical/software engineers and advising clinicians at the Anesthesiology Department of the University of Florida at Gainesville. The system was developed using macromedia director 8.0 to perform the animation and SoundForge XP 4.0d for the sound effects. To view the animation, the shockwave Web player specific to the user's PC platform (Windows or Macintosh) must first be obtained via a free download. Although the intent is that the package will be used via the Web, instructions are also provided for users who wish to use the package for teaching but do not have a live internet connection. Also included at the Web site is a detailed excellent "Virtual Anesthesia Machine Tutorial" as well as a comprehensive list of learning objectives.

[Hint Number 98] www.emedicine.com

This is an excellent online resource that is filled with useful information. It is particularly good for getting quick, trustworthy information on medical conditions and syndromes. The information is constantly updated, and a peer-review process helps ensure that the information is correct. I use the search engine more than any other feature of this site.

[Hint Number 99] Anesthesiology Resource for PDA Users

http://www.unc.edu/~rvp/RP_Anesthesia/

This site provides a number of anesthesia educational resources that can be downloaded to your PDA for offline review.

[Hint Number 100] Study Groups

Form a study group to discuss a number of clinical scenarios and how they might be managed. Appendix 4 lists some scenarios to begin with.

APPENDIX 1

CONTRAINDICATIONS TO SUCCINYLCHOLINE

(Adapted from http://www.theairwaysite.com/featured_airway_article.html)

- **Lack of Airway Management Equipment or Skills**
- **Susceptibility to Malignant Hyperthermia**
- **Incomplete Airway Obstruction such that positive pressure ventilation would not likely be successful (as in epiglottitis) [Goal: keep patient breathing spontaneously as long as possible]**
- **Extensive Burns**
- **Extensive Muscle Trauma**
- **Disuse Atrophy or Prolonged Immobilization**
- **Prolonged Intraabdominal Sepsis**
- **Preexisting Hyperkalemia**
- **Denervation Syndromes such as:**
 - Spinal Cord injury
 - Stroke
 - Guillain-Barre Syndrome
 - Botulism
- **Myopathies such as:**
 - Duchenne Muscular Dystrophy
 - Becker Muscular Dystrophy
- **Pseudohypertrophic Muscular Dystrophy**
 - Non-specific Myopathies

Bibliography

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APPENDIX 2

ACC/AHA Guidelines on Perioperative Cardiovascular Evaluation for Non-Cardiac Surgery: 2002

Sources:

- <http://www.gasnet.org/acc/clinical-factors.php>
- <http://www.gasnet.org/acc/surgical-factors.php>
- <http://www.gasnet.org/acc/functional-capacity.php>
- <http://www.gasnet.org/acc/8-steps.php>

The basic clinical evaluation obtained by history, physical examination and review of ECG provides sufficient data to estimate cardiac risk. Various 'cardiac risk indices'(CRI) have been developed in the past 25 years, based on a scoring system that assigns more weight to some factors than others and sums them to arrive at a composite risk. However, estimation of risk using these CRI is cumbersome. Recently, a simplified index consisting of 6 independent correlates for the prediction of cardiac risk for stable patients undergoing non-urgent, non-cardiac surgery has been suggested. The 6 independent risk factors include: ischemic heart disease, congestive heart failure, cerebral vascular disease, high risk surgery, preoperative insulin treatment for diabetes and pre-operative creatinine of 2 mg/dl. An increasing number of risk factors correlates with increased risk.

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The ACC/AHA guidelines have grouped clinical predictors into 3 categories:

- I. Major clinical predictors,
- II. Intermediate clinical predictors and
- III. Minor clinical predictors.

I. **Major clinical predictors include:**

- a. Unstable coronary syndrome
 - Acute (1-7days) or recent (7-30 days) myocardial infarction with evidence of important ischemic risk by clinical symptoms or non-invasive study.
 - Unstable or severe angina (Canadian class III or IV).
- b. Decompensated heart failure.
- c. Significant arrhythmias
 - High grade AV block.
 - Symptomatic ventricular arrhythmias in the presence of underlying heart disease.
 - Supraventricular arrhythmias with uncontrolled ventricular rate.
- d. Severe valvular disease.

Presence of major predictors mandates intensive management, which may result in delay or cancellation non-emergent surgery.

II. **Intermediate clinical predictors include:**

- a. Mild angina pectoris.
- b. Previous MI by history or pathologic Q waves.
- c. Compensated or prior heart failure.
- d. Diabetes mellitus (particularly insulin-dependent).
- e. Renal insufficiency.

Intermediate clinical predictors are well validated markers of enhanced risk of perioperative cardiac complications. Their presence justifies careful assessment of the patient's current status.

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III. Minor clinical predictors include:

- a. Advanced age.
- b. Abnormal ECG (left ventricular hypertrophy, left bundle branch block, ST-T abnormalities).
- c. Rhythm other than sinus (e.g. atrial fibrillation).
- d. Low functional capacity.
- e. History of stroke.
- f. Uncontrolled systemic hypertension.

While minor predictors are recognized markers of coronary artery disease, they have not been proven to independently increase perioperative risk.

Surgery-specific risk factors

The unique feature of the original ACC/AHA guideline was to incorporate risk based on scheduled non-cardiac procedures. This risk stratification has been slightly modified in the new update, but maintains the same cardiac risk stratification for non-cardiac surgical procedures into 3 categories namely high, intermediate and low.

High risk non-cardiac surgical procedures are reported to have cardiac risk often greater than 5% and include:

- emergent major operations, particularly in the elderly
- aortic and other major vascular surgery
- peripheral vascular surgery
- anticipated prolonged surgical procedures associated with large fluid shift and/or anticipated blood loss.

Intermediate risk non-cardiac surgical procedures are reported to have cardiac risk generally less than 5% and include:

- carotid endarterectomy
- head and neck surgery
- intraoperative and intrathoracic surgery
- orthopedic surgery
- prostate surgery

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Low risk non-cardiac surgical procedures are reported to have less than 1% risk of cardiac events and include:

- endoscopic procedures
- superficial procedures
- cataract surgery
- breast surgery

Functional Capacity

The third variable that was taken into account for the formulation of the 8 step algorithm is functional capacity. Functional capacity can be expressed in metabolic equivalent (MET) level; the O₂ consumption (VO₂) of a 70 kg, 40 yr old man in a resting state is 3.5 ml/kg/min or 1 MET. Perioperative cardiac and long-term risks are increased in patients unable to meet a 4-MET demand during most normal daily activities. Examples of leisure activities with less than 4 METs are baking, slow ballroom dancing, golfing with a cart, walking at a speed of approximately 2-3 mph. Activities requiring more than 4 METs include climbing hills, ice skating, running a short distance. More than 10 METs include participation in sports like swimming, football, single tennis, basketball and skating.

8-step Approach to Perioperative Cardiac Assessment

STEP I: Determine the urgency of surgery. If emergent, take the patient to the OR. If indicated, perform cardiac risk factor management post-operatively.

STEP II: If the surgery is not emergent, query if the patient has undergone coronary revascularization [CABG or percutaneous coronary intervention (PCI)] in the past 5 years. If there is no recurrence of symptoms, the patient does not require any further workup and surgery can proceed. If there is recurrence of symptoms, proceed to step III.

STEP III: Has the patient undergone invasive or non-invasive coronary evaluation in the past 2 years? If the results are favorable and there has been no change in clinical status, no further testing is required. However, if results are unfavorable or there is a change in clinical status and no evaluation has been done, proceed to step IV.

STEP IV: Classify the patient based on the clinical risk group as outlined above. If the patient has any of the major clinical risk predictors, consider delaying or canceling non-cardiac surgery for further pre-operative cardiac testing and management. If the patient does not have major clinical predictors, proceed to step V.

STEP V: Classify patient into intermediate risk group or low risk group. If the patient has intermediate clinical risk predictors, proceed to step VI. If patient has low risk predictors, proceed to step VII.

STEP VI: In a patient with intermediate clinical risk predictors, determine functional capacity. If functional capacity is <4 METs, consider non-invasive testing (STEP VIII). If

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functional capacity is more than 4 METs, consider the risk of surgery. If patient is undergoing high-risk surgery, refer for non-invasive testing (STEP VIII). If undergoing intermediate or low risk surgery consider proceeding with surgery without further testing.

STEP VII: In a patient, who has minor or no clinical predictors, determine the functional capacity. If functional capacity is <4 METs and patient is to undergo a high risk procedure, consider non-invasive testing. If the patient's functional capacity is <4 METs, but is to undergo intermediate or low risk procedure no further testing is required. Similarly, in patients with > 4 METs functional capacity and with low or no clinical predictors, surgery can proceed without further cardiac evaluation.

STEP VIII: Perform non-invasive testing for further risk stratification and management, before deciding to proceed with surgery.

APPENDIX 3 Sample Reference Sheet

ANESTHETIC CONSIDERATIONS IN THE ALCOHOLIC PATIENT

Respiratory System

1. Most alcoholics are heavy smokers with some degree of bronchitis and chronic obstructive lung disease (COPD).
 2. If ascites is present, the patient may have reduced lung volume. A reduced functional residual capacity (FRC) leads to early desaturation when apnea is present. The ascites also appears as a restrictive lung defect on pulmonary function testing.
 3. Alcoholic patients are potentially aspiration prone if they are drunk to the extent that pharyngeal reflexes are blunted.
 4. Rib fractures may be present (from falls)
 5. Pleural effusions may be present.
3. Hepatic insufficiency may lead to:
 - (i) low protein levels (esp. albumin)
 - (ii) low clotting factors (all factors except VIII are made in the liver; factors II, VII, IX and X need vitamin K for their synthesis)
 - (iii) hepatic encephalopathy
 - (iv) predisposition to hypoglycemia

Cardiovascular System

1. May have a high-shunt state with reduced systemic vascular resistance (SVR) and increased cardiac output (CO).
2. An alcoholic cardiomyopathy may be present.

Gastrointestinal System

1. Portal hypertension and esophageal varices may be present. May require portosystemic shunts or sclerotherapy respectively.
2. Ascites may be present.

Endocrine

1. Alcoholic patients are prone to hypoglycemia
2. Hypogonadism may be present.

Hematologic System

1. Malnutrition may lead to megaloblastic anemia (Folate / B12 deficiency)
2. Iron deficiency anemia may be present from bleeding esophageal varices
3. Chronic thrombocytopenia may be due to hypersplenism (platelet sequestration in the spleen).

4. Acute thrombocytopenia may occur with severe alcohol intoxication

Central Nervous System

1. Central, peripheral and autonomic lesions.

(i) **Central**

- (a) cortical atrophy
- (b) agitation, delirium tremens (DTs) and seizures with alcohol withdrawal
- (c) Wernicke-Korsakoff syndrome with memory loss and confabulation
- (d) Hepatic encephalopathy /hepatic coma

(ii) **Peripheral**

peripheral neuropathy, often in glove and stocking distribution

(iii) **Autonomic lesions:** possible orthostatic hypotension

2. Alcoholic patients are more likely to develop epidural/ subdural hematomas from falling in a drunken stupor.

Drug-Related

1. Decreased albumin means less protein binding sites and higher drug levels in protein-bound drugs (e.g. thiopental)

2. Decreased metabolism of hepatically metabolized drugs.

3. Increased volume of distribution for many drugs; means that a larger loading dose and smaller maintenance dose is appropriate.

4. MAC is decreased in the acutely intoxicated alcoholic, but may be elevated with chronic intoxication.

Miscellaneous

1. Malnutrition +/- vitamin deficiency (e.g. thiamine)

2. Poor dental hygiene (teeth may be easily knocked out with intubation).

Remember

Elective surgery should only be undertaken with extreme caution (or not at all) in patients with acute hepatitis or cirrhosis, since the operative mortality rate is quite high in these patients.



The alcoholic patient may offer many challenges to the anesthesiologist

<http://public.srce.hr/prevencijaovisnosti/pictures/alcoholic.jpg>

APPENDIX 4

CASES AND ISSUES FOR DISCUSSION

[1] A 77-year-old man weighing 114 kg, 177 cm in height, is scheduled for an elective repair of a 10 cm suprarenal abdominal aortic aneurysm. He had an uncomplicated myocardial infarction 8 months previously and has been a non-insulin dependent diabetic for over 20 years. Discuss your anesthetic management of this case. What are your main concerns? What would you do differently if this were a leaking aneurysm?

[2] A 60 year old 80 kg woman presents with the sudden onset of upper and lower extremity weakness and tingling. MRI scan reveals a cervical epidural mass. An emergent laminectomy in the prone position is planned. Patient has a 100 pack year smoking history, chronic cough and shortness of breath on walking two blocks. BP 150/90; HR 96; R 28; T 37.5 deg. C; Hgb 17.

A. Preoperative Evaluation

- Evaluation of head and neck position and neurologic status: Is it important to evaluate the effect of the patient's head and neck position on her neurologic system? Why/why not? Can you do this safely? Suppose she is symptom-free only when in the right lateral decubitus position. How will you position patient for anesthetic induction?
- Evaluation of pulmonary function: How would you assess patient's pulmonary function preoperatively? Would you require PFT's? Why/why not? Which ones with reasons? How will results affect your anesthetic management? Might patient's neurologic problem affect the results of PFT's? Why/why not? Would ABG's be of value? What would you be looking for?

B. Intraoperative Course

- Monitors: Is an arterial catheter indicated? Why/why not? Does the presence of an arterial catheter make a pulse oximeter unnecessary? Why/why not? Would you insert a central venous catheter? Is the measurement of central venous pressure accurate in a patient in the prone position? Is PAOP

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measurement accurate? Explain.

- Anesthetic induction and maintenance: A colleague suggests that you intubate patient awake and allow her to turn herself into the prone position. Agree/disagree? Rationale for answer. How would you manage airway and protect neurologic function during induction and endotracheal intubation? What agent(s) would you choose for induction? Reasons for choice(s). Would you administer a muscle relaxant? Why/why not? Which one? What are your primary considerations in choosing an agent for anesthetic maintenance? Your choice and rationale.
- Wheezing and hypoxemia: Immediately after patient is turned into the prone position, SpO₂ falls from 98% to 94%. Causes? Mgmt? You listen to the chest and hear bilateral expiratory wheezes. Mgmt? SaO₂ falls to 91%. Ddx? Rx? Would you allow case to proceed?
- Air embolus: During resection of mass, extensive bleeding develops. Surgeon requests reverse Trendelenburg position to control bleeding. You respond? After position change and bleeding diminishes you note the PetCO₂ has decreased from 32 to 21 mmHg. What might be the etiology? How would you proceed?

C. Postoperative Care

- Postoperative airway management: The surgeon requests early extubation in order to do a neurologic evaluation in the operating room. Agree/disagree? Following extubation patient exhibits air hunger. Breath sounds are inaudible bilaterally. Mgmt? What do you think is the cause of her respiratory insufficiency?
- Burn: Patient is noted to have silver dollar sized burn over right iliac crest. What might be the cause? How does this happen? Management? Explanation to patient.

From http://www.wethington.net/boardreview/oral/neuro/cervical_epidural_mass.htm

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[3] A 25 year old man develops masseter muscle spasm after receiving fentanyl 50 mcg, propofol 200 mg and succinylcholine 140 mg during a rapid sequence induction for a suspected hot appendix. To your horror, you find that you are unable to open the patient's mouth.

1. What do you do about this? Should you cancel the case? Should you administer dantrolene?
2. When you finally are able to open up the mouth to insert your laryngoscope, you see copious gastric contents pooled in the oropharynx. What do you do now?

Resource: Saddler JM. Jaw stiffness - an ill understood condition. Br J Anaesth 1991; 67: 515-16

[4] During a one hour appendectomy in a 75 kg, 30 year old otherwise healthy female, succinylcholine 100 mg was given for intubation, and rocuronium 30 mg was given for muscle relaxation. Postoperatively the patient remained unexpectedly apneic, despite having received only 100 mcg of fentanyl. What do you think might be going on? How will you sort out this matter? Can you provide a differential diagnosis? Are there any blood tests that might be helpful in this setting?

[5] Pediatrics: A 2.5 kg neonate requires repair of a diaphragmatic hernia. What signs and symptoms will you expect to find during your preoperative evaluation? What are the anesthetic concerns for this patient? Are there initial therapeutic maneuvers necessary prior to the procedure? Discuss. Should N2O be avoided? Should 100% oxygen be administered? Why/why not? Outline/defend your anesthetic choice.

From http://www.wethington.net/boardreview/oral/neuro/cervical_epidural_mass.htm

[6] Regional anesthesia: A 23 year old male is scheduled for shoulder arthroplasty. He is terrified of general anesthesia and desires to remain awake. You respond. What alternatives are available for anesthesia? What would you choose? Why? Compare an interscalene vs. supraclavicular block. Advantages/disadvantages. Could this procedure be done with an interscalene block alone? Why/why not?

From http://www.wethington.net/boardreview/oral/neuro/cervical_epidural_mass.htm

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[7] Emergency surgery in a cocaine addict: What potential problems in anesthetic management might occur in a cocaine addict who requires emergency surgery for repair of a trimalleolar fracture of the ankle? Would a general or regional anesthetic be preferable? Why? Would acute intoxication vs. chronic use of cocaine alter choice? Why/Why not?

From http://www.wethington.net/boardreview/oral/neuro/cervical_epidural_mass.htm

[8] A 69-year old, 92 kg man with benign prostatic hypertrophy with occasional urinary retention. He is scheduled for a trans-urethral resection of the prostate (TURP). He has hypertension, for which he takes metoprolol when he remembers. Blood pressure is 200/110 mmHg, and pulse is 75 bpm. Creatinine is 2.1 mg/dl.

Is he adequately beta blocked? Is his blood pressure adequately treated? Should you cancel the case? How might you reduce the blood pressure preoperatively? Why is the creatinine elevated? Are there any advantages of regional anesthesia for this operation? If a spinal is done, what level of block is required? Almost an hour into the case (under spinal anesthesia), the patient becomes agitated and confused. What is likely going on? What are you going to do about it?

[9] A 29-year old, 82 kg man is a T5 paraplegic scheduled for a cystoscopy.

Given that he has no sensation below the waist, is anesthesia necessary for the procedure? What is autonomic hyperreflexia, and what level of spinal cord lesion is it associated with? If the patient is to be intubated, are there any special concerns about administering succinylcholine?

[10] A 3-year old boy is scheduled for bilateral myringotomy and tubes. The case was previously cancelled because of a fever. Now he has rhinorrhea and a temperature of 38.6 centigrade by oral thermometer. No cough is present, and the chest is clear.

Should you cancel the case once again? If you proceed, should the child be intubated? What about management of the case when there is a cough productive of sputum?

QUESTIONS FOR DISCUSSION

[1] How long a fast before elective surgery?

http://www.findarticles.com/p/articles/mi_m0950/is_5_112/ai_111062809

[2] The effect of epidural anesthesia on the length of labor

http://www.findarticles.com/p/articles/mi_m0689/is_n3_v40/ai_16722350

[3] 44-Year-Old Jehovah's Witness With Life-Threatening Anemia From Uterine Bleeding

<http://www.chestjournal.org/cgi/content/full/125/3/1151>