

MEDICINE CONSULT SERVICE

I. **Educational Purpose** - An important skill for a general internist is to learn their role as consultant. This activity should include the care of hospitalized patients on surgical services, as well as the outpatient preoperative evaluation and management of medical conditions in pregnant women and in patients with psychiatric disease. As a consultant, the internist frequently has a central role in the overall management of the patients' medical care by coordinating sub specialists' recommendations and assuring long-term follow-up.

General internists should have an appreciation of the body of knowledge that is developed in consultative medicine. Most importantly is an understanding of the physiologic response to surgery and anesthesia, disease related and procedure related risk, prophylactic therapy to prevent perioperative problems, and postop medical complications. The general internist should also sufficiently understand the physiology of pregnancy and the categories of psychiatric disease and its pharmacologic treatment to manage medical problems in these patients effectively.

Given the broad nature of consultative medicine, the range of competencies in medical consultation varies little among practice settings. However, the extent and complexity of the role may be determined by the availability of surgical anesthesia, trauma/critical care, obstetric, psychiatric, and other specialists, including internal medicine sub specialists. Optimal consultative care requires skills that can be adapted to both office practices in a variety of hospital settings including outpatient and day surgery.

Since medical consultation is practiced at the interface of Internal Medicine and other specialties, it requires familiarity with those specialties, skill in synthesizing information, and appropriate effective communication with other consulting physicians, dentists, other health care workers, and families.

The common clinical presentations that will be seen during this rotation include the following:

- Evaluation of an abnormal result on a routine preoperative test.
- Assessment of a need for antibiotic prophylaxis for invasive procedures.
- Assessment of a need for anticoagulation as a prophylactic procedure.
- Assessment of a need for hemodynamic monitoring during surgery.
- Assessment of a need for transfer to medical service including a need for critical care monitoring.
- Assessment and management of preoperative risk.
- Medical problems arising during the postoperative recovery.
- Medical problems in psychiatric patients.
- Drug reactions and complications.

II. **Learning Venue**

A. **Rotation Description** - The Med Consult rotation is for senior residents only. This busy consult service that sees inpatients at both the VA and University Hospital involves a broad range of perioperative assessment and medical management on inpatient, Rehab and Psychiatric floors. There are an average of 1-5 consults/day. This is often one of the most fundamental rotations for residents to function as primary consultants with non-Medicine specialists. In addition the Med consult residents will see any patients where a request for a Dermatology consult is called. Please refer to the Educational Curriculum Link for a full description and expectations of interpersonal/communication skills and professionalism.

B. **Teaching Methods.**

1. **Daily Attending rounds** - The primary learning process during this rotation involves residents independently assessing all consults that have been called, formulating an opinion and plan and then presenting those findings to the attending. This is a one-on-one opportunity to work with an attending and is an important way to learn the nuances of preop risk assessment, postop management, and the interface of multiple specialties with core medicine topics. In addition to reviewing new consults the resident and attending will conduct daily bedside rounds

together on all follow-up cases. After seeing any patient for Dermatology consult the resident will contact with and meet with the Dermatology attending to review the case.

2. Expected reading – see link to case based modules (**Link**)

- a. 'ACC/AHA Guideline Update for Our Perioperative Cardiovascular Evaluation for Non-Cardiac Surgery-Executive Summary', www.americanheart.org/downloadable/heart/perioperative.pdf.
- b. 'Up-To-Date under Medical Consultation'
- c. *Annals of Internal Medicine* position paper on Guidelines for Assessing and Managing the Perioperative Risk from Coronary Artery Disease Associated with Major Non-Cardiac Surgery. www.annals.org/cgi/content/full/127/4/309.
- d. *Annals of Internal Medicine* position paper on The Perioperative Assessment and Management of Risks from Coronary Artery Disease, www.annals.org/cgi/content/full/127/4/313.
- e. Update in Perioperative Medicine. *Ann Intern Med*, Mar 2004; 140: 452 - 461.
- f. B-blockers and reduction of cardiac events in noncardiac surgery. *JAMA*. 2002;287-;1435-44
- g. [Current Concepts: Preoperative Pulmonary Evaluation](#). *N Engl J Med* 1999; 340:937-944, Mar 25, 1999
- h. An Update on Perioperative Management of Diabetes. *Archives of Internal Medicine*, Nov 1999; 159: 2405 - 2411.
- i. [Corticosteroid Supplementation for Adrenal Insufficiency](#). *JAMA* 2002; 287: 236-240.

- For Dermatology references see the following online resources

<http://medstat.med.utah.edu/kw/derm/>
<http://telemedicine.org/stamford.htm>
<http://www.vh.org/adult/provider/dermatology/PietteDermatology/BasicDermatology.html>
<http://www.meddean.luc.edu/lumen/MedEd/medicine/dermatology/melon/atlas.htm>
<http://www.dermatlas.com/derm/>

3. Unique Learning Opportunities.

- Pre & post-operative interpretation of the EKGs.
- Perioperative use of pulmonary function testing and ABGs in risk assessment.
- Noninvasive and invasive assessment of venous thromboembolic disease pre- and postop.
- Noninvasive and invasive assessment of cardiac risks.

4. Mix of Diseases. Patients from the age of 18 and up on the Surgical, Psychiatric, or Rehab services are included in the patient characteristics. They are of all ethnicities and likely equally split male and female. The following general common categories of diseases are seen in the following list.

III. Educational Content

- A. Preop evaluation of disease related risks from surgery.
 - Acute and chronic renal failure
 - Arrhythmias, conduction disturbances
 - Cerebrovascular or other neurologic disorders
 - Chronic obstructive pulmonary disease, asthma
 - Congestive heart failure
 - Coronary artery disease
 - Diabetes mellitus
 - Electrolyte disorders
 - Hematologic and clotting disorders
 - HIV infection
 - Infectious disease
 - Liver disease
 - Obesity
 - Psychiatric disease
 - Rheumatologic disorders
 - Substance abuse
 - Thyroid disease
 - Valvular heart disease
- B. Postoperative complications.
 - Acid base disorders
 - Acute neurologic disease
 - Acute renal failure
 - Adult respiratory distress syndrome
 - Alcohol withdrawal syndromes
 - Arrhythmia, cardiac arrest
 - Atelectasis pneumonia or aspiration
 - Chest pain, dyspnea
 - Delirium
 - Diabetes
 - Fever
 - Gastrointestinal dysfunction
 - Hematologic disorders, bleeding
 - Hypertension, hypotension
 - Jaundice, liver dysfunction
 - Postoperative pain
 - Sepsis, multiorgan failure
 - Thromboembolic disease
 - Transfusion reactions
 - Volume, tonicity, or electrolyte disorders
- C. Prevention of complications
 - Antibiotic prophylaxis (including for endocarditis)
 - Postoperative pulmonary complications
 - Reaction to contrast media
 - Stress related gastrointestinal mucosal disease
 - Thromboembolism
 - Transfusion associated disease
- D. Drug metabolism, reactions and interactions
- E. Medical complications of pregnancy
- F. Nutritional assessment
- G. Physiologic changes in the elderly

- IV. **Evaluations** – All residents will be evaluated by their supervising attending using the online E-value system. Residents are encouraged to seek mid rotation verbal feedback. Non-medicine services, both physician and ancillary staff, are encouraged to submit online 'praise or concern' cards.
- V. **Rotation Specific Competencies.**
- C. Patient care – Medical Consult rotation offers a unique opportunity to participate in the care of the patients with a subset of problems most commonly seen on surgical services. In addition, there is the opportunity to participate in complex pharmacologic recommendations often involving polypharmacy in psychiatric patients and the longer-term management of medical problems in patients on a Rehab service.
 - D. Medical knowledge – This is often the first time that residents are exposed to the unique body of information about perioperative risk assessment and postoperative management of unique post surgical problems. A residents learning should be largely self-directed with reading from the recommended reading list and guidance from the medical attending.
 - E. Professionalism – Medical Consult rotation allows the senior resident to develop professional relationships with surgical, psychiatric, and rehab colleagues and to function as primary advice giver for simple and complex medical issues in their patients.
 - F. Interpersonal communication skills – Clear and direct medical advice is expected and mentored during this rotation in order to help residents develop a practice style that is collegial, friendly, and helpful to those calling consults.
 - G. Practice based learning – link
 - H. Systems based practice – link

Reviewed 10/05 by Dr's Richard Sohn, Anthony Karabanow, Waleed Javid, Peter Cronkright, and Matt Glidden.

MEDICINE CONSULT CASES (Adapted from actual UH cases)

Case 1.

A 45-year-old male is readmitted for ORIF of multiple facial fractures sustained 2 weeks ago in an assault. After the assault he was monitored in the hospital for 2 days. He then went home to await reconstructive surgery.

He has a history of mild, intermittent asthma for which he uses an albuterol inhaler as needed. He is very active and able to play basketball once a week. He drinks a 12 pack of beer a day and smokes crack monthly. His last drink was 24 hours ago and his last smoke of crack was 1 month ago. Lung exam reveals clear lungs and good air movement.

1. What is the risk of this type of procedure (head/neck surgery)?
(Low, intermediate, high)
2. What is his perioperative cardiac event risk?

(Low, intermediate, high)

3. What other medical issues are important in managing this patient?
4. What is his risk for DVT?
(Low, intermediate, high)
5. What method would you suggest for DVT prophylaxis?
(Early ambulation, graduated compression stockings, sequential compression devices, LMWH, Mini dose Heparin, warfarin, IVC filter)

ANSWERS:

1. Head and neck surgery actually poses greater risk for a perioperative cardiac event than one might expect. It is classified as “intermediate” risk procedure.
2. The patient is young and reasonably healthy. His functional capacity is >4 METS. He does not have known CAD. Per ACC/AHA algorithm, the patient may proceed to surgery. He does not need a preoperative stress test.
3. This patient is at risk for alcohol withdrawal. He needs delirium tremens prophylaxis, thiamine, MVI, and folate. He has mild persistent asthma so his Albuterol should be continued and he should also be on a steroid inhaler. Since his crack use was a month ago, we don’t need to worry about hypertensive crisis or cocaine induced vasospasm.
4. His risk for DVT is moderate. He is undergoing major surgery (general anesthesia over 30 minutes). He is over 40 years old.
5. For surgical patients at moderate risk for DVT, we would recommend low dose unfractionated heparin (LDUH) q8hours or q12 hours OR LMWH (Dalteparin 2500 or 5000 IU SQ qday or Enoxaparin 40 mg SQ qday) OR intermittent pneumatic compression devices.

Case 2.

A 44-year-old male with Type 2 Diabetes, hypertension, and hyperlipidemia is admitted for ORIF of a medial malleolar fracture sustained 2 weeks ago while playing soccer. His HbA1c was 11 one month ago. He is on Metformin 1000 mg bid and Glyburide 10 mg a day. He quit smoking 1ppd one month ago. He never has chest pain.

1. What is his preoperative cardiac risk?
(Low, moderate, high)

2. Does he need stress test prior to ORIF? If so, what kind of stress test would you recommend?
3. How would you manage his diabetes?
4. What is his risk for DVT?
(Low, moderate, high)
5. What should we suggest for DVT prophylaxis?
Unfractionated heparin, LMWH, graduated compression stockings (Teds), SCDs, warfarin?
6. Should we suggest starting a beta-blocker?

ANSWERS:

1. His perioperative risk is intermediate. Per ACC/AHA algorithm, he has an intermediate clinical predictor (diabetes). His functional capacity, however, is >4 METS. He can proceed to surgery.
2. He does not need a stress test prior to ORIF
3. Metformin should be held while in the hospital because of the risk of lactic acidosis after procedures. Because his glycemic control is so poor, we will convert him to insulin. We will start Lantus and regular insulin.
4. His risk for DVT is moderate.
5. We would suggest low dose unfractionated heparin or LMWH, or intermittent pneumatic compression devices.
6. Yes, start a beta-blocker. Beta-blockers can decrease the perioperative MI risk in patients with vascular disease or those at risk for heart disease. He has multiple risk factors for CAD. Would recommend Atenolol 50-100 mg po qday or Bisoprolol 5-10 mg a day. The pulse needs to decrease to near 60 beats per minute. The beta-blocker should be continued at least for the duration of the hospitalization (some would say for a month).

Case 3.

Ortho calls you to see an 80-year-old female in the ER. She slipped on wet leaves and fractured her hip. They plan to do ORIF. She had an MI and PTCA 10 years ago. In the past 6 months, she has had exertional chest pain. Her only medication is aspirin 81 mg a

day. PE is unremarkable. EKG shows Q waves in II, III and aVF. The tracing is unchanged from that done 5 years ago.

1. What is her risk for perioperative MI?
(Low, moderate, high)
2. Should she undergo a stress test? If so, what kind?
3. What would you recommend for DVT prophylaxis?
4. Should she get a beta-blocker?

ANSWERS:

1. Her risk for a perioperative cardiac event is high. She has unstable angina. Her PTCA was done over 10 years ago and is probably re-stenosed.
2. She should undergo coronary angiography. Call a cardiology consult.
3. Hip fracture places her at very high risk for DVT/PE. If her creatinine clearance is >30 ml/min, suggest LMWH. Alternatively, suggest warfarin with INR target of 2-3.
4. Yes, she should get a beta-blocker.

Case 4.

A 76-year-old female is scheduled for laparoscopic sigmoid colon resection for recurrent diverticulitis. She is on warfarin for non-valvular atrial fibrillation. She has hypertension. There is no history of CAD. She has never had a stroke. She denies having any chest pain or dyspnea on exertion. She is able to walk up and down stairs, do housework, and play golf. Medications include Atenolol 50 mg a day as well as warfarin (INR target 2-3).

1. What is her risk for a perioperative cardiac event?
2. What is her CHADS2 score?
3. What would you advise for her anticoagulation?

ANSWERS:

1. The surgery is intermediate risk (intrapertitoneal). The procedure, however, is elective and she has excellent functional capacity. She has minor clinical

predictors. She is at low/intermediate risk for the procedure. She does not need preoperative stress testing.

2. Her CHADS2 score is 2 corresponding to an embolic event rate of 2.50% per year without warfarin.
3. Warfarin should be held for 2-3 days prior to surgery to allow the INR to drift to 1.5. Warfarin can then be restarted on the night after surgery. Allow INR to gradually drift up to 2-3. Warfarin will serve to protect her from arterial emboli and venous emboli (DVT/PE)

Case 5.

A 65-year-old female is scheduled for hip arthroplasty. She is s/p mitral valve replacement 10 years ago for rheumatic mitral disease. Her coronaries were clean 10 years ago at cath. She has atrial fibrillation. Cardiac catheterization done 10 years ago showed insignificant coronary artery disease. Her functional capacity is limited because of arthritis. She cannot walk up a flight of stairs because of hip pain and dyspnea. Her medications include Atenolol, warfarin, and acetaminophen. Her INR is 3.

1. What is her preoperative risk?
2. What noninvasive test would you order?
3. What is her CHADS2 score?
4. What would you advise for anticoagulation?

ANSWERS.

1. She has at least intermediate clinical predictors. Her functional capacity is less than 4 METS. She needs noninvasive testing
2. Dobutamine stress test or nuclear stress test would be appropriate. She cannot walk on a treadmill.
3. CHADS2 only applies for nonvalvular atrial fibrillation. Her atrial fibrillation is secondary to rheumatic mitral disease.
4. Mitral valve replacement (MVR) patients have twice the risk of arterial embolization than patients who have had an aortic valve replacement. For a MVR patient, warfarin should be held for a few days prior to surgery. When the INR falls below 2, IV Heparin should be started. IV Heparin is given until 6 hours prior to the procedure. Warfarin is restarted night of surgery. IV

heparin is restarted as soon as possible after surgery and is continued until INR is therapeutic for at least 48 hours. LMWH is an alternative to IV Heparin.

Case 6.

A 50 year old female is admitted to Urology for hydronephrosis secondary to a renal stone. She has pyelonephritis. She is to undergo ureteral stent placement and lithotripsy. She has had “diet controlled” diabetes for 2 years. On admission, her blood glucose is 300. Her bicarbonate is normal. Her creatinine is 2.1 Weight is 100 kg.

1. How would you manage her diabetes?
(ADA diet, metformin, glyburide, insulin)

ANSWER.

1. Her infection has worsened her glycemic control. She will now need medications to treat her diabetes. Metformin is contraindicated in this setting (cr >1.3, need for IV contrast, severe acute infection). Glyburide is not a good option as it is renally metabolized. The best option would be to start a basal insulin like NPH or Lantus along with regular insulin sliding scale. Her dose of NPH would be 0.2-0.4 units/kg or 20-40 Units divided in 2 doses. If starting lantus, reduce the dose by 20 percent. Some would start just 10 units Lantus sq once daily.

Case 7.

A 50-year-old male with COPD is admitted to general surgery for a small bowel obstruction secondary to adhesions. The patient has longstanding COPD and takes Combivent qid as well as albuterol prn. His FEV1 was 1 liter 6 months ago. He continues to smoke 2ppd. He is able to climb a flight of stairs, take out the trash, and go grocery shopping. He denies having had chest pain.

The surgeons call you for preop clearance (should he need to go to the O.R). They would also like you to make suggestions about the management of his COPD.

1. What is his perioperative risk?
2. Would you order spirometry if he had not had it done before hospitalization?
3. What can be done to optimize his respiratory status?

ANSWERS:

1. The patient has minor clinical predictors. He might undergo an intermediate risk procedure (lysis of adhesions if the SBO does not resolve with bowel rest and NG suction). His functional capacity is >4 METS.

The proposed surgery is non-vascular. He does not need stress testing prior to surgery.

2. No. Spirometry wouldn't change the course of management.
3. Interventions to reduce perioperative risk include use of incentive spirometry, early ambulation and good pain control. His lung disease has not significantly decreased his functional capacity. Steroids (inhaled or oral) are not indicated.