

SURGERY REVIEW – CARLOS PESTANA

Introduction

The following outline was created by Dr. Pestana at the University of Texas Health Sciences at San Antonio, Texas to assist medical students with the **review** of clinical **surgery**.

This collection of surgical vignettes has been written to be used in conjunction with a 12-hour **review** course for Step 2 of the USMLE. So, how can one condense in 12 hours the material that took 125 hours in the classroom plus 12 weeks in the wards, to deliver originally? It sounds like a hopeless task. But it is not. We all know that **review** courses are not meant to be substitutes for Medical School. They are simply meant to refresh your memory, to hit upon the highlights. The key to such a course is **selection**.

Selection starts with the format. Step 2 of the USMLE is an examination of clinical subjects. To make it pertinent, an effort is made to include as many questions as possible in the form of a clinical vignette. Thus, material that does not lend itself to that pattern is less likely to appear on the exam. Diseases that do not have a “classic” presentation, or that have to be diagnosed by exclusion, make less attractive questions. Those that can be diagnosed “over the phone” are perfect choices. Thus, this **review** is structured around vignettes.

Any medical subject is fair game for the exam, but to make it relevant emphasis is placed on “high impact” diseases, ie: those that either occur frequently, or have significant consequences for the patient if not properly diagnosed and treated; or both. There is another obvious criteria for selection. Granted, we will miss many questions that deal with trivia...but there will not be many of those. Time spent preparing for them could be put to better use reviewing the big issues. I have selected 324 vignettes that hopefully represent those important items. The available classroom time will allow in depth **review** of only a fraction of those, and the others are offered as additional material for **review** on your own time.

Every vignette needs to be recognized for what it is. To paraphrase Sir William Osler, the three more important items in the practice of medicine are the diagnosis, the diagnosis and the diagnosis. (I think he said that before his famous admonition to “...and above all keep the patient away from the hands of the surgeons”...but that’s another matter). Indeed, one could say the same about exams. If you cannot figure out the diagnosis, you are hopelessly lost. So, we have to start there. But unfortunately, it does not end there. Very few questions will simply ask for a diagnosis. You will find those in the extended sets, where an impressive list of diagnosis has to be matched with an equally long list of one-line vignettes. (“Any one of which can be used once, more than once or none at all”). Many of the vignettes will ask for more. They will leapfrog the diagnosis and go right on to ask about further diagnostic tests, or treatment. This is done on the logical assumption that unless you have the correct diagnosis, you will not be able to figure out what to do next. Examination experts call that “questions of higher cognitive value”, which is a fancy way to say that they get two for the price of one.

But at times, they actually get three for the price of one. Many questions will not ask for the test that you need to confirm the diagnosis, or the treatment that you would use. A sneaky set of words is used instead: what is the next (or best) step in the management of the patient. A step could be a diagnostic step or a therapeutic step, and management is a pretty broad word that is

equally non-committal. So, as we **review** our vignettes we will try to figure out if the clinical diagnosis conveyed by the short presentation (“the telephone diagnosis”) is specific enough to determine therapy or not. The classical vignette of the young adult with right lower quadrant pain, localized tenderness, muscle guarding and rebound right where the appendix lives is sufficient to trigger a choice for emergency surgical exploration. But the fat female who is fecund and forty, has fatty food intolerance and is getting episodes of right upper quadrant colicky pain needs a sonogram to confirm the diagnosis before you schedule the laparoscopic cholecystectomy. We will figure these out as we go along.

But another snag awaits us there. Medicine is making a valiant effort to become a science. Outcome-based decision-making is the current buzzword. But to a great extent, it still is an art. Which is to say, many times we fly by the seat of our pants. And that kind of flying is done differently in different institutions, at different parts of the country. The National Board of Medical Examiners has a formidable system of quality control when it comes to examination questions. Each item has to please a legion of tough critics, who look for every possible inconsistency or ambiguity. But it is still inevitable that every now and then, the answer to a question will reflect the biases and preferences of some practitioners, and might be missed by others who would handle the case differently. That is nature of our profession.

I have picked only “classical” vignettes, so I doubt that my diagnosis would be seriously challenged on many of them, but in selecting the famous “management”, I may be at variance with others...possibly those who wrote the questions. Sorry about that. The only consolation that I can give you there, is to remind you that you only need to answer about 55 to 65% of the questions correctly to pass the exam. So, there is a little leeway built into the system.

Carlos Pestana, M.D.

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1. TRAUMA

A. Head Trauma

1. – A 14-year-old boy is hit over the right side of the head with a baseball bat. He loses consciousness for a few minutes, but recovers promptly and continues to play. One hour later he is found unconscious in the locker room. His right pupil is fixed and dilated.

What is it? – Acute epidural hematoma (probably right side)

How is it diagnosed? – CT scan

Treatment? – Emergency surgical decompression (craniotomy). Good prognosis if treated, fatal within hours if it is not.

2. – A 32-year-old male is involved in a head-on, high-speed automobile collision. He is unconscious at the site, regains consciousness briefly during the ambulance ride and arrives at the E.R. in deep coma, with a fixed, dilated right pupil.

What is it? – Could be acute epidural hematoma, but acute subdural is better bet.

Diagnosis? – CT scan. Also need to check cervical spine!

Treatment? – Emergency craniotomy, poor prognosis because of brain injury.

3. – A 77-year-old man becomes “senile” over a period of three or four weeks. He used to be active and managed all of his financial affairs. Now he stares at the wall, barely talks and sleeps most of the day. His daughter recalls that he fell from a horse about a week before the mental changes began.

What is it? – Chronic subdural hematoma. (venous bleeding, size 7 brain in size 8 skull)

How is diagnosis made? – CT scan.

Treatment: Surgical decompression (craniotomy). Spectacular improvement expected.

4. – A car hits a pedestrian. He arrives in the ER in coma. He has...(raccoon eyes... or clear fluid dripping from the nose...or clear fluid dripping from the ear...or ecchymosis behind the ear)...

What is it? – Base of the skull fracture.

How is it diagnosed? – CT scan. Needs cervical spine X-Rays.

Implications for therapy: needs neurosurgical consult, needs antibiotics.

B. Shock

5. – A 45-year-old man is involved in a high-speed automobile collision. He arrives at the ER in coma, with fixed dilated pupils. He has multiple other injuries (extremities, etc). His blood pressure is 70 over 50, with a feeble pulse at a rate of 130. What is the reason for the low BP and high pulse rate?

Point of the question: It is not from neurological injury. (Not enough room in the head for enough blood loss to cause shock). Look for answer of significant blood loss to the outside (could be scalp laceration), or inside (abdomen, pelvic fractures).

6. – A 22-year-old gang member arrives in the E.R. with multiple gun shot wounds to the abdomen. He is diaphoretic, pale, cold, shivering, anxious, asking for a blanket and a drink of water. His blood pressure is 60 over 40. His pulse rate is 150, barely perceptible.

What is it? – Hypovolemic shock

Management: Several things at one: Big bore IV lines, Foley catheter and I.V. antibiotics. Ideally exploratory lap immediately for control of bleeding, and then fluid and blood administration. If O.R. not available, fluid resuscitation while waiting for it.

7. – A 22-year-old gang member arrives in the E.R. with multiple gun shot wounds to the chest and abdomen. He is diaphoretic, pale, cold, shivering, anxious, asking for a blanket and a drink of water. His blood pressure is 60 over 40. His pulse rate is 150, barely perceptible.

What is it? – Hypovolemic shock still the best bet, but the inclusion of chest wounds raises possibility of pericardial tamponade or tension pneumothorax. As a rule if significant findings are not included in the vignette, they are not present. Thus, as given this is still a vignette of hypovolemic shock, but you may be offered in the answers the option of looking for the missing clinical signs: distended neck veins (or a high measured CVP) would be common to both tamponade and tension pneumo; and respiratory distress, tracheal deviation and absent breath sounds on a hemithorax that is resonant to percussion would specifically identify tension pneumothorax.

8. – A 22-year-old gang member arrives in the E.R. with multiple gun shot wounds to the chest and abdomen. He is diaphoretic, cold, shivering, anxious, asking for a blanket and a drink of water. His blood pressure is 60 over 40. His pulse rate is 150, barely perceptible. He has big distended veins in his neck and forehead. He is breathing OK, has bilateral breath sounds and no tracheal deviation.

What is it? – Pericardial tamponade

Management: No X-Rays needed, this is a clinical diagnosis! Do Pericardial window. If positive, follow with thoracotomy, and then exploratory lap.

9. – Identical to the previous one, but with only a single gunshot wound in the precordial area: when the location of the wound strongly suggests pericardial tamponade, emergency thoracotomy might be done right away without prior pericardial window.

10. – A 22-year-old gang member arrives in the E.R. with multiple gun shot wounds to the chest and abdomen. He has labored breathing is cyanotic, diaphoretic, cold and shivering. His blood pressure is 60 over 40. His pulse rate is 150, barely perceptible. He is in respiratory distress, has big distended veins in his neck and forehead, his trachea is deviated to the left, and the right side of his chest is tympanic, with no breath sounds.

What is it? – Tension pneumothorax.

Management: Immediate big bore IV catheter placed into the right pleural space, followed by chest tube to the right side, right away! Watch out for trap that offers chest X-Ray as an option. This is a clinical diagnosis, and patient needs that chest tube now. He will die if sent to X-Ray. Exploratory lap will follow.

11. – A 72 year old man who lives alone calls 911 saying that he has severe chest pain. He cannot give a coherent history when picked up by the EMT, and on arrival at the ER he is cold and diaphoretic and his blood pressure is 80 over 65. He has an irregular, feeble pulse at a rate of 130. His neck and forehead veins are distended and he is short of breath.

What is it? – Many findings similar to above cases, but no trauma, old man, chest pain: i.e.: straightforward cardiogenic shock, from massive MI.

Management: verify high CVP. EKG, enzymes, coronary care unit etc. Do not drown him with enthusiastic fluid “resuscitation”, but use thrombolytic therapy if offered.

12. – A 17 year old girl is stung by a swarm of bees...or a man of whatever age breaks out with hives after a penicillin infection...or a patient undergoing **surgery** under spinal anesthetic...eventually develop BP of 75 over 25, pulse rate of 150, but they look warm and flush rather than pale and cold. CVP is low.

What is it? – Vasomotor shock (massive vasodilation, loss of vascular tone)

Management: Vasoconstrictors. Volume replacement would not hurt.

13. – A 25-year-old man is stabbed in the right chest. He is moderately short of breath, has stable vital signs. No breath sounds on the right. Resonant to percussion.

What is it? – Plain pneumothorax.

How is diagnosis verified? There is time to get a chest X-Ray if the option is offered.

Treatment: Chest tube to underwater seal and suction. If given option for location, high in the pleural cavity.

14. – A 25-year-old man is stabbed in the right chest. He is moderately short of breath, has stable vital signs. No breath sounds on at the base on the right chest, faint distant breath sounds at the apex. Dull to percussion.

What is it? – Sounds more like hemothorax.

How do we find out? - Chest X-Ray

If confirmed, treatment is chest tube on the right, at the base of the pleural cavity.

15. – A 25-year-old man is stabbed in the right chest. He is moderately short of breath, has stable vital signs. No breath sounds on at the base on the right chest, faint distant breath sounds at the apex. Dull to percussion. A chest tube placed at the right pleural base recovers 120 cc of blood, drains another 20 c in the next hour.

Further treatment: The point of this one is that most hemothoraxes do not need exploratory **surgery**. Bleeding is from lung parenchyma (low pressure), stops by itself. Chest tube is all that is needed. **Key clue**: little blood retrieved, even less afterwards.

16. – A 25-year-old man is stabbed in the right chest. He is moderately short of breath, has blood pressure is 95 over 70, pulse rate of 100. No breath sounds on at the base on the right chest, faint distant breath sounds at the apex. Dull to percussion. A chest tube placed at the right pleural base recovers 1250 cc of blood...(or it could be only 450 cc at the outset, but followed by another 420 cc in the next hour and so on).

Further treatment: The rare exception who is bleeding from a systemic vessel (almost invariably intercostal). Will need thoracotomy to ligate the vessel.

17. – A 25-year-old man is stabbed in the right chest. He is moderately short of breath, has stable vital signs. No breath sounds on the right. Resonant to percussion at the apex of the right chest, dull at the base. Chest X-Ray shows one single, large air-fluid level.

What is it? – Hemo-pneumothorax. Chest tube, **surgery** only if bleeding a lot.

18. – A 33-year-old lady is involved in a high-speed automobile collision. She arrives at the E.R. gasping for breath, cyanotic at the lips, with flaring nostrils. There are bruises over both sides of the chest, and tenderness suggestive of multiple fractured ribs. Blood pressure is 60 over 45.

Pulse rate 160, feeble. She has distended neck and forehead veins, is diaphoretic. Left hemithorax has no breath sounds, is tympanic to percussion.

What is it? – A variation on an old theme: classic picture for tension pneumothorax...but Where is the penetrating trauma? : The fractured ribs can act as a penetrating weapon.

Management: chest tube to the left right away! Do not fall for the option of getting X-Rays first, but you need them later to rule out wide mediastinum (aortic rupture).

19. – A 54-year-old lady crashes her car against a telephone pole at high speed. On arrival at the E.R. she is in moderate respiratory distress. She has multiple bruises over the chest, and multiple sites of point tenderness over the ribs. X-Rays show multiple rib fractures on both sides. On closer observation it is noted that a segment of the chest wall on the left side caves in when she inhales, and bulges out when she exhales.

What is it? – Classical physical diagnosis finding of paradoxical breathing, leading to classical diagnosis of flail chest. She is at high risk for other injuries.

Management: Rule out other injuries (aortic rupture, abdominal injuries) The real problem is flail chest is the underlying pulmonary-contusion, for which the treatment is controversial, including fluid restriction, diuretics, use of colloid rather than crystalloid fluids when needed, and respiratory support. The probable wrong alternatives will revolve around various ways of mechanically stabilizing the part of the chest wall that moves the wrong way...because that used to be what was believed in the past.

Further management: if other injuries require that she go to the OR, prophylactic bilateral chest tubes because she is at high risk to develop tension pneumothorax when under the positive pressure breathing of the anesthetic.

20. – A 54-year-old lady crashes her car against a telephone pole at high speed. On arrival at the E.R. she is breathing well. She has multiple bruises over the chest and multiple sites of point tenderness over the ribs. X-Rays show multiple rib fractures on both sides, but the lung parenchyma is clear and both lungs are expanded. Two days later her lungs “white out” on X-Rays and she is in respiratory distress.

What is it? – Pulmonary contusion. It does not always show up right away, may become evident one or two days after the trauma.

Management: Fluid restriction (using colloid), diuretics, respiratory support. The latter is key, with intubation, mechanical ventilation and PEEP if needed.

21. – A 54-year-old lady crashes her car against a telephone pole at high speed. On arrival at the E.R. she is breathing well. She has multiple bruises over the chest, and is exquisitely tender over the sternum at a point where there is a crunching feeling of crepitation elicited by palpation.

What is it? – Obviously a sternal fracture...but the point is that she is at high risk for myocardial contusion and for traumatic rupture of the aorta.

Further tests: as you would do for a MI : EKG, cardiac enzymes, but the real important ones would be CT scan, transesophageal echo or arteriogram looking for aortic rupture.

22. – A 53-year-old man is involved in a high-speed automobile collision. He has moderate respiratory distress. Physical exam shows no breath sounds over the entire left chest. Percussion is unremarkable. Chest X-Ray shows air fluid levels in the left chest.

What is it? – Classical for traumatic diaphragmatic rupture. It is always on the left.

Further test? Not really needed. A nasogastric tube curling up into the left chest might be an added tid bit.

Management: Surgical repair.

23. – A motorcycle daredevil attempts to jump over the 12 fountains in front of Caesar's Palace Hotel in Las Vegas. As he leaves the ramp at very high speed his motorcycle turns sideways and he hits the retaining wall at the other end, literally like a rag doll. At the Er. he is found to be remarkably stable, although he has multiple extremity fractures. A chest X-Ray shows fracture of the left first rib and widened mediastinum.

What is it? – Actually a real case. Classical for traumatic rupture of the aorta: King size trauma, fracture of a hard-to-break bone (it could first rib, scapula or sternum) and the tell-tale hint of widened mediastinum

How is the diagnosis made? – Arteriogram (aortogram).

Treatment: Emergency surgical repair.

24. – A 34-year-old lady suffers severe blunt trauma in a car accident. She has multiple injuries to her extremities, has head trauma and has a pneumothorax on the left. Shortly after initial examination it is noted that she is developing progressive subcutaneous emphysema all over her upper chest and lower neck.

What is it? – Traumatic rupture of the trachea or major bronchus.

Additional findings: Chest X-Ray would confirm the presence of air in the tissues.

Management: Fiberoptic bronchoscopy to confirm diagnosis and level of injury and to secure an airway. Surgical repair after that.

C. Abdominal Trauma

25. – A 26-year-old lady has been involved in a car wreck. She has fractures in upper extremities, facial lacerations and no other obvious injuries. Chest X-Ray is normal. Shortly thereafter she develops hypotension, tachycardia and dropping hematocrit. Her CVP is low.

What is it? – Obviously blood loss, but the question is where. The answer is easy: it has to be in the abdomen. To go into hypovolemic shock one has to lose 25 to 30% of blood volume, which in the average size adult will be nearly a liter and a half (25 to 30% of 4.5 to 5 liters). In the absence of external hemorrhage (scalp lacerations can bleed that much), the bleeding has to be internal. That much blood can not fit inside the head, and would not go un-noticed in the neck (huge hematoma) or chest (X-Rays can spot anything above 150 cc). Only massive pelvic fractures, multiple femur fractures or intra-abdominal bleeding can accommodate that much blood. The first two would be obvious in physical exam and X-Rays. The belly can be silent. Thus the belly is invariably the place to look for that hidden blood.

How is it diagnosed? - We have a choice here. The old, invasive way was the diagnostic peritoneal lavage. The newer, non-invasive ways are the CAT scan or sonogram. CT scan is best, but it can not be done in the patient who is “crashing”. (the X-Ray department is a never-never land where patients die unattended). Try to gage from the question whether the patient is stable – do CT scan, or literally dying on your hands, in which case diagnostic peritoneal lavage or sonogram is done in the E.R.

Eventual therapy: most likely finding will be ruptured spleen. If stable, observation with serial CT scans will follow. If not, exploratory laparotomy.

26. – A 19 year old gang member is shot in the abdomen with a 38 caliber revolver. The entry wound is in the epigastrium, to the left of the midline. The bullet is lodged in the psoas muscle on the right. He is hemodynamically stable, the abdomen is moderately tender.

Management: No diagnostic tests are needed. A penetrating wound of the abdomen gets exploratory laparotomy every time. Only hidden trap you might get in the question relates to preparations prior to **surgery**: an indwelling bladder catheter, a big bore venous line for fluid administration and a dose of broad spectrum antibiotics.

27. – A 19 year old gang member is shot once with a 38 caliber revolver. The entry wound is in the left mid-clavicular line, two inches below the nipple. The bullet is lodged in the left paraspinal muscles. He is hemodynamically stable, but he is drunk and combative and physical exam is difficult to do.

What is it? – The point here is to remind you of the boundaries of the abdomen: although this sounds like a chest wound, it is also abdominal. The belly begins at the nipple line. The chest does not end at the nipple line, though. Belly and chest are not stacked up like pancakes: they are separated by a dome. This fellow needs all the stuff for a penetrating chest wound (chest X-Ray, chest tube if needed), plus the exploratory lap.

28. – A 27 year old intoxicated man smashes his car against a tree. He is tender over the left lower chest wall. Chest X-Ray shows fractures of the 8th, 9th and 10th ribs on the left. He has a blood pressure of 85 over 68 and a pulse rate of 128.

What is it? – This one is a classic: ruptured spleen. We already went over the business of where blood can hide, the abdomen is the place, but within the belly the most fragile solid organ that gives clinically significant bleeding is the spleen. (The liver is actually more likely to be the site of bleeding when CT scans are done on patients with blunt abdominal trauma, but often the bleeding from the liver is not clinically significant). In the absence of other clues, clinically significant hidden intra-abdominal bleeding comes from a ruptured spleen. This case is actually full of other clues that point to the spleen.

First negotiate the diagnostic dilemma: if he responds promptly to fluid administration, and does not require blood, go for the CT scan. Further management in that case may well be continued observation with serial CT scans. If he is “crashing”, he will need the peritoneal lavage or sonogram followed by exploratory laparotomy.

29. – A 27 year old intoxicated man smashes his car against a tree. He is tender over the left lower chest wall. Chest X-Ray shows fractures of the 8th, 9th and 10th ribs on the left. He has a blood pressure of 85 over 68 and a pulse rate of 128, which do not respond satisfactorily to fluid and blood administration. He has a positive peritoneal lavage and at exploratory laparotomy a ruptured spleen is found.

What is the issue here? – You are unlikely to be asked technical surgical questions, but when dealing with a ruptured spleen an effort will be made to repair it rather than remove it. In children the effort will be even greater. But if the vignette says that the spleen had to come out, then further management includes administration of pneumovax and some would also immunize for hemophilus influenza B and Meningococcus.

30. – A 31 year old lady smashes her car against a wall. She has multiple injuries including upper and lower extremity fractures. Her blood pressure is 75 over 55, with a pulse rate of 110. On physical exam she has a tender abdomen, with guarding and rebound on all quadrants.

What is it? – Blood in the belly is not always, “silent”. It can elicit peritoneal reaction. When it does, you put two and two together and do not need fancy diagnostic tests. Furthermore, blood is not the only thing that can be loose in the belly after trauma: intestinal contents can spill over from ruptured hollow viscus...and that calls for repair also. The question here would be what to do, and the answer would be exploratory lap.

31. – A 31 year old lady smashes her car against a wall. Hollow viscera will spill their contents. Often they both happen, but one can exist without the other. Here there is not evidence of blood loss, but plenty of clues to suggest that “evil fluid” is loose in the belly.

What will she need? - Exploratory lap, and repair of the injuries.

D. Urological Trauma

32. – A patient involved in a high speed automobile collision has multiple injuries, including a pelvic fracture. On physical exam there is blood in the meatus.

What is it? – The vignette will be longer, but the point is that pelvic fracture plus blood in the meatus means either bladder or urethral injury. Evaluation starts with a retrograde urethrogram because urethral injury would be compounded by insertion of a Foley catheter.

33. – A 19 year old male is involved in a severe automobile accident. Among many other injuries he has a pelvic fracture. He has blood in the meatus, scrotal hematoma and the sensation that he wants to urinate but can not do it. Rectal exam shows a “high riding prostate”.

What is it? - This is a more complete description of a posterior urethral injury.

How is the diagnosis made? - You already know: retrograde urethrogram

Management: They will not ask you, but these get a suprapubic catheter, and the repair is delayed 6 months.

34. – A 19 year old male is involved in a motorcycle accident. Among many other injuries he has a pelvic fracture. He has blood in the meatus and scrotal hematoma. Retrograde urethrogram shows an anterior urethral injury.

A variation of the above theme. The only difference is that anterior urethral injuries are repaired right away.

35. – A patient involved in a high speed automobile collision has multiple injuries, including a pelvic fracture. Insertion of a Foley catheter shows that there is gross hematuria.

What is it? – Presumably there was no blood in the meatus to warn against the insertion of an indwelling catheter, and since the latter was accomplished without problem, the urethra must be intact. That leaves us with bladder injury.

Assessment will require retrograde cystogram.

36. – A patient involved in a high speed automobile collision has multiple injuries, including rib fractures and abdominal contusions. Insertion of a Foley catheter shows that there is gross hematuria, and retrograde cystogram is normal.

What is it? – Lower injuries have been ruled out. The blood has to be coming from the kidneys.

How is the diagnosis made? – CT scan.

Further management: They will not ask you for fine-judgment surgical decisions, but the rule is that traumatic hematuria does not need **surgery** even if the kidney is smashed.

They operate only if the renal pedicle is avulsed or the patient is exsanguinating.

37. – A patient involved in a high speed automobile collision has multiple injuries, including rib fractures and abdominal contusions. Insertion of a Foley catheter shows that there is hematuria, and retrograde cystogram is normal. CT scan shows renal injuries that do not require **surgery**. Six weeks later the patient develops acute shortness of breath and a flank bruit.

38. – A 35 year old male is about to be discharged from the hospital where he was under observation for multiple blunt trauma sustained in a car wreck. It is then discovered that he has microscopic hematuria.

Management: Gross traumatic hematuria in the adult always has to be investigated.

39. – A 4 year old falls from his tricycle. In the ensuing evaluation he is found to have microscopic hematuria.

Management: This one is here to contrast it with the previous one. Microhematuria in kids needs to be investigated, as it often signifies congenital anomalies...particularly if the magnitude of the trauma does not justify the bleeding. Start with sonogram.

40. – A 14 year old boy slides down a banister, not realizing that there is a big knob at the end of it. He smashes the scrotum and comes in to the E.R. with a scrotal hematoma the size of a grapefruit.

What is it? – The issue in scrotal hematomas is whether the testicle is ruptured or not.

How is the diagnosis made? – Sonogram will tell.

Management: If ruptured, **surgery** will be needed. If intact, only symptomatic treatment.

41. – A 41 year old male presents to the E.R. reporting that he slipped in the shower and injured his penis. Exam reveals a large penile shaft hematoma with normal appearing glans.

What is it? – A classical description of fracture of the tunica albuginea...including the usual cover story given by the patient. These always happen during sexual intercourse with woman on top...but patient will not say so.

Management: this is one of the few urological emergencies. Surgical repair is needed.

E. Burns

42. – You get a phone call from a frantic mother. Her 7 year old girl spilled Drano all over her arms and legs. You can hear the girl screaming in pain in the background.

Management: The point of this question is that chemical injuries – particularly alkalis-need copious, immediate, profuse irrigation. Instruct the mother to do so right at home with tap water, for at least 30 minutes before rushing the girl to the E.R.

43. – While trying to hook up illegally to cable TV, an unfortunate man comes in contact with a high tension electrical power line. He has an entrance burn wound in the upper outer thigh and an exit burn lower down on the same side.

Management: The issue here is that electrical burns are always much bigger than they appear to be. There is deep tissue destruction. The patient will require extensive surgical debridement, but there is also another item (more likely to be the point of the question): Myoglobinemia, leading to myoglobinuria and to renal failure. Patient needs lots of IV fluids, diuretics (osmotic if given that choice i.e. Mannitol), perhaps alkalinization of the urine.

44. – A man is rescued by firemen from a burning building. On admission it is noted that he has burns around the mouth and nose, and the inside of his mouth and throat look like the inside of a chimney.

What is it? – The issue here is respiratory burns, i.e.: smoke inhalation producing a chemical burn of the tracheobronchial tree. It happens with flame burns in an enclosed space. The burns in the face are an additional clue that most patients will not have.

Diagnosis is made with bronchoscopy.

Management revolves around respiratory support.

45. – A patient has suffered third degree burns to both of his arms when his shirt caught on fire while lighting the back yard barbecue. The burned areas are dry, white, leatherly anesthetic, and circumferential all around arms and forearms.

What is it? – You are meant to recognize the problem posed by circumferential burns: The leatherly eschar will not expand, while the are under the burn will develop massive edema, thus circulation will be cut off. (Or in the case of circumferential burns of the chest, breathing will be compromised). Note that if the fire was in the open space of the backyard, respiratory burn is not an issue.

Management: Compulsive monitoring of peripheral pulses and capillary filling.

Escharotomies at the bedside at the first sign of compromised circulation.

46. – A toddler is brought to the E.R. with burns on both of his buttocks. The areas are moist, have blisters and are exquisitely painful to touch. The story is that the kid accidentally pulled a pot of boiling water over himself.

What is it ? – Burns, of course...but there are several issues: first, how deep. The description is classical for second degree. (Note that in kids third degree is deep bright red, rather than white leatherly as in the adult). How did it really happen? Burns in kids always bring up the possibility of child abuse, particularly if they have the distribution that you would expect if you grabbed the kid by arms and legs and dunked him in a pot of boiling water.

Management for the burn is silvadene (silver sulphadiazine) cream. Management for the kid may require reporting to authorities for child abuse.

47. – An adult male who weight “X” Kgs. Sustains second and third degree burns over ---whatever--- The burns will be depicted in a drawing, indicating what is second degree (moist, blisters, painful) and what is third degree (white, leatherly, anesthetic). The question will be about fluid resuscitation.

Management: - Time to dust off the old formula: 4cc per Kg. of body weight per percentage of burned area (up to 50). Percentage to be calculated by the rule of nines: one nine each for head and arms, two nines for each leg, four nines for the trunk. (In kids the head is twice as big, the legs take up the slack). Give ringers lactate, pour it in so that half of the calculated dose goes in during first 8 hours.

Lots of additional questions could ensue from the basic burn vignette:

If the colloids are to be used, give them in the second day (not the first).

Monitoring to see if your calculation are correct: CVP and hourly urinary output. Keep the former below 15 or 20, aim for 1 cc per Kg body weight per hour for the latter.

Circumstances where additional fluid is needed (aiming for urinary output of two cc per Kg per hour, instead of one): electrical burns, patients who get escharotomy.

A classical one, bound to be in the test somewhere: Patient was well resuscitated, had good hemodynamic parameters but required a lot of fluid. On the third day he starts to pee out a storm. What does that mean? : nothing. You expect it. The fluid from the burn edema is coming back to the circulation.

What to do for the burn areas? After the obvious cleansing, silvadene cream for most areas, sulphamyelone where deep penetration is needed (cartilage, thick eschar), triple antibiotic ointment in the face near the eyes (silvadene hurts the eyes).

Skin grafting will ensue, but they will not ask about it (too technical). However the emphasis on prevention may lead to questions about the timing of rehabilitation: the answer is that rehabilitation starts on day one.

48. – A 42 year old lady drops her hot iron on her lap while doing the laundry. She comes in with the shape of the iron clearly delineated on her upper thigh. The area is white, dry, leatherly, anesthetic.

What is the issue? - A current favorite of burn treatment is the concept of early excision and grafting. After fluid resuscitation the typical burn patient spends two weeks in the hospital consuming thousand of dollars of health care every day, getting topical treatment to the burn areas and intensive nutritional support in preparation for skin grafting. In most cases there is no alternative. But less extensive burns can be taken to the O.R., excised and grafted on day one, saving tons of money. You will not be asked to provide the fine judgement call for the borderline case that might be done that way, but the vignette is a classical one where the decision is easy: very small and clearly third degree.

Answer: Early excision and grafting.

F. Bites

49. – Let us end the trauma **review** with a classic. A 22 year old gang leader comes to the E.R. with a small, 1 cm. deep sharp cut over the knuckle of the right middle finger. He says he cut himself with a screwdriver while fixing his car.

What is it? – The description is classical for a human bite. No, nobody actually bit him, he did it by punching someone in the mouth...and getting cut with the teeth that were smashed by his fist. The imaginative cover story usually comes with this kind of lesion. The point of management is that human bites are bacteriological the dirtiest that one can get. Rabies shots will not be needed, but surgical exploration by an orthopedic surgeon will be required.

2. SKIN

SK.1. – A 65 year old West Texas farmer of Swedish ancestry has an indolent, raised, waxy, 1.2 cm skin mass over the bridge of the nose that has been slowly growing over the past three years. There are no enlarged lymph nodes in the head and neck.

What is it? – Basal cell carcinoma.

How is it diagnosed? - Full thickness biopsy at the edge of the lesion (punch or knife).

Treatment: Surgical excision with clear margins, but conservative width.

SK.2. – A 71 year old West Texas farmer of Irish ancestry has a non-healing, indolent, punched out, clean looking 2 cm. ulcer over the left temple, that has been slowly becoming larger over the past three years. There are no enlarged lymph nodes in the head and neck.

What is it, and what needs to be done? - Same as above. This is another way for basal cell carcinoma to show up.

SK.3. – A blond, blue eyed, 69 year old sailor has a non-healing, indolent 1.5 cm. ulcer on the lower lip, that has been present, and slowly enlarging for the past 8 months. He is a pipe moker, and he has no other lesions or physical findings.

What is it? - Squamous cell carcinoma.

How is the diagnosis made? - Biopsy, as described before.

Treatment: he will need surgical resection with wider (about 1 cm.) clear margins. Local radiation therapy is another option.

SK.4. – A red headed 23 year old lady who worships the sun, and who happens to be full of freckles, consults you for a skin lesion on her shoulder that concerns her. She has a pigmented lesion that is asymmetrical, with irregular borders, of different colors within the lesion, and measuring 1.8 cms.

What is it? – The classical ABCD that alerts you to melanoma or a forerunner (dysplastic nevus).

Management: full thickness biopsy at the edge of the lesion, margin free local excision if superficial melanoma (Clarks' levels one or two, or under 0.75 mm), wide local excision with 2 or 3 cm. margin if deep melanoma.

SK.5. – A 35 year old blond, blue eyed man left his native Minnesota at age 18, and has been living an idyllic life as a crew member for a sailing yacht charter operation in the Caribbean. He has multiple nevi all over his body, but one of them has changed recently...

What is it? – Change in a pigmented lesion is the other tip off to melanoma. It may be growth, or bleeding, or ulceration, or change in color...whatever. Manage as above.

SK.6. – A 44 year old man has unequivocal signs of multiple liver metastasis, but no primary tumor has been identified by multiple diagnostic studies of the abdomen and chest. The only abnormality in the

physical exam is a missing toe, which he says was removed at the age of 18 for a black tumor under the toenail.

What is it? - A classical vignette for malignant melanoma (the alternate version has a glass eye, and history of enucleation for a tumor). No self-respecting malignant tumor would have this time interval, but melanoma will.

SK.7. – A 32 year old gentleman had a Clark's level 5, 3.4 mm. Deep, melanoma removed from the middle of his back three years ago. He now has...(a tumor in a weird place, like his left ventricle, his duodenum, his ischiorectal area...anywhere!).

The point of this vignette is that invasive melanoma (it has to be deep) metastasizes to all the usual places (lymph nodes plus liver-lung-brain-bone) but it is also the all-time-champion in going to weird places where few other tumors dare to go.

3. BREAST

BR.1. – An 18 year old lady has a firm, rubbery mass in the left breast that moves easily with palpation.

What is it? - Fibroadenoma.

How is the diagnosis made? - The underlying concern in all breast masses is cancer. The only safe answer, even if the presentation favors benign disease, is to get tissue diagnosis. In this case it should be done in the least invasive way possible: If offered, FNA (fine needle aspirate for cytology). If not, core biopsy or if it is the only choice, excisional biopsy. Reassurance alone would not be a good choice! Mammogram alone is not the way to go, either. Mammogram is primarily for screening, not for diagnosis. At age 18, mammograms are useless (breast too dense). Sonogram is the only imaging technique suitable for the very young breast.

BR.2. – A 27 year old immigrant from Mexico has a 12 x 10 x 7 cm. mass in her left breast. It has been present for seven years, and slowly growing to its present size. The mass is firm, rubbery, completely movable, is not attached to chest wall or to overlying skin. There are no palpable axillary nodes.

What is it? - Cystosarcoma Phyllodes.

Management: Tissue diagnosis is needed (some of these become outright malignant sarcomas), given the size best done with core or incisional biopsy. Margin-free resection will follow.

BR.3. – A 35 year old lady has a ten year history of tenderness in both breasts, related to menstrual cycle, with multiple lumps on both breasts that seem to “come and go” at different times in the menstrual cycle. Now has a firm, round, 2 cm. mass that has not gone away for 6 weeks.

What is it? - Fibrocystic disease (cystic mastitis, mammary dysplasia, with a palpable cyst).

Management: tissue diagnosis (i.e: biopsy) becomes impractical when there are lumps every month. Aspiration of the cyst is the answer here. If the mass goes away and the fluid aspirated is clear, that's all. If the fluid is bloody it goes to cytology. If the mass does not go away, or recurs she needs biopsy. Answers that offer mammogram or sonogram in addition to the aspiration would be OK, but not as the only choice.

BR.4. – A 34 year old lady has been having bloody discharge from the right nipple, on and off for several months. There are no palpable masses.

What is it? - Intraductal papilloma.

What is to be done? - The old concern over cancer is the issue, and the way to detect cancer that is not palpable is with a mammogram. That should be the first choice. If negative, one may still wish to find and resect the intraductal papilloma to provide symptomatic relief. Resection can be guided by galactogram, or done as a retroareolar exploration.

BR.5. – A 26 year old lactating mother has cracks in the nipple and develops a fluctuating, red, hot, tender mass in the breast, along with fever and leukocytosis.

What is it? - Sounds like an abscess...and in this setting it is. However, only lactating breasts are “entitled” to develop abscesses. On anybody else, a breast abscess is a cancer until proven otherwise.

Management: Incision and drainage is the Rx. For all abscesses, this one included. But, if an option includes drainage with biopsy of the abscess wall, go for that one.

BR.6. – A 49 year old has a firm, 2cm. mass in the right breast, that has been present for 3 months.

What is it? - This could be anything. Age is the best determinant for Cancer of the breast. If she had been 72, you go for cancer. At 22, you favor benign. But they will not ask you what this is, they will ask what do you do.

Management: You have to have tissue. Core biopsy is OK, but if negative you don't stop there: only excisional biopsy will rule out cancer.

BR.7 and 8. – A 69 year old lady has a 4 cm. hard mass in the right breast, with ill defined borders, movable from the chest wall but not movable within the breast. The skin overlying the mass is retracted and has an "orange peel" appearance...or the nipple became retracted six months ago.

What is it? - Classical cancer of the breast.

What do you do? - Establish the diagnosis with tissue, as mentioned above.

BR.9. – A 72 year old lady has a red, swollen breast. The skin over the area looks like orange peel. She is not particularly tender, and it is debatable whether the area is hot or not. She has no fever or leukocytosis.

What is it? - Another classic for cancer of the breast.

Management: Same as above: get that tissue diagnosis (here a punch biopsy of the skin is an option. It probably is permeated with cancer).

BR.10. – A 62 year old lady has an eczematoid lesion in the areola. It has been present for 3 months and it looks to her like "some kind of skin condition" that has not improved or gone away with a variety of lotions and ointments.

What is it? - Another sneaky way for cancer of the breast to show up. If you get this one in an extended matching set, the answer is Paget's disease of the breast-which is a cancer under the areola.

Management: same as above: get tissue! A full thickness punch biopsy of the skin would be OK, but core biopsy or incisional biopsy of the tissue underneath would be OK also.

BR.11. – A 42 year old lady hits her breast with a broom handle while doing her housework. She noticed a lump in that area at the time, and one week later the lump is still there. She has a 3 cm. hard mass deep inside the affected breast, and some superficial ecchymosis over the area.

What is it? - A classical trap for the unwary. It is cancer until proven otherwise. Trauma often brings the area to the attention of the patient...but is not cause of the lump.

BR.12. – A 58 year old lady discovers a mass in her right axilla. She has a discreet, hard, movable, 2 cm. mass. Examination of her breast is negative, and she has not enlarged lymph nodes elsewhere.

What is it? - A tough one, but another potential presentation for cancer of the breast. In a younger patient you would think lymphoma. It could still be lymphoma on her. She needs a mammogram (we are now looking for an occult primary), and the node will eventually have to be biopsied.

BR.13. – A 60 year old lady has a routine, screening mammogram. The radiologist reports an irregular area of increased density, with fine microcalcifications, that was not present two year ago on a previous mammogram.

What do you do? - You will not be asked to read X-Rays (particularly mammograms), but you should recognize the description of a malignant radiological image – which this one is. Thus, we go back to our old issue: we need tissue diagnosis. In this case the first attempt should be stereotactic radiologically guided core biopsy. If unsatisfactory, the next move would be needle localized excisional biopsy.

BR.14. – A 44 year old lady has a 2 cm. palpable mass in the upper outer quadrant of her right breast. A core biopsy shows infiltrating ductal carcinoma. The mass is freely movable and her breast is of normal, rather generous size. She has no palpable axillary nodes.

The question is obviously what to do. The standard option here is segmental resection (lumpectomy), to be followed by radiation therapy to the remaining breast, as well as axillary node dissection to help determine the need for adjuvant systemic therapy.

BR.15. – A 62 year old lady has a 4 cm. hard mass under the nipple and areola of her rather smallish left breast. A core biopsy has established a diagnosis of infiltrating ductal carcinoma. There are no palpable axillary nodes.

Again, a management question. Lumpectomy is an option only when the tumor is small (in absolute terms and in relation to the breast) and located where most of the breast can be spared. A modified radical mastectomy is the choice here. Why go after the axillary nodes when they are not palpable?: Because palpation is notoriously inaccurate in determining the presence or absence of axillary metastasis.

BR.16. – A 44 year old lady shows up in the Emergency Room because she is “bleeding from the breast”. Physical exam shows a huge, fungating, ulcerated mass occupying the entire right breast, and firmly attached to the chest wall. The patient maintains that the mass has been present for only “a few weeks”, but a relative indicates that it has been there at least two years, maybe longer.

What is it? – An all too frequent tragic case of neglect and denial. Obviously a far advanced cancer of the breast.

Management: the tissue diagnosis is still needed, and either a core or an incisional biopsy is in order, but the likely question here is what to do next. This is an inoperable, and incurable as well...but palliation can be offered. Chemotherapy is the first line of treatment. In many cases the tumor will shrink enough to become operable.

BR.17. – A 37 year old lady has a lumpectomy and axillary dissection for a 3 cm. infiltrating ductal carcinoma. The pathologist reports clear surgical margins and metastatic cancer in four out of 17 axillary nodes.

The question here is what to do next: Only very small tumors with negative nodes and very favorable histological pattern are “cured” with surgery alone. More extensive tumors need adjuvant systemic therapy, and the rule is that premenopausal women get chemotherapy and postmenopausal women get hormonal therapy. This is one clear one for chemotherapy.

BR.18. – A 66 year old lady has a modified radical mastectomy for infiltrating ductal carcinoma of the breast. The pathologist reports that tumor measures 4 cm. in diameter and that 7 out of 22 axillary node are positive for metastasis. The tumor is estrogen and progesterone receptor positive.

A variation on the previous one, but here a clear choice for hormonal therapy. The agent used is Tamoxifen.

BR. 19. – A 44 year old lady complains bitterly of severe headaches that have been present for several weeks and have not responded to the usual over-the-counter headache remedies. She is two years post-op. from modified radical mastectomy for T3, N2, M0 cancer of the breast, and she had several courses of post-op chemotherapy which she eventually discontinued because of the side effects.

What is it? – A classic: severe headaches in someone who a few years ago had extensive cancer of the breast means brain mets until proven otherwise. Don't get hung up on the TNM classification, if the numbers are not 1 for the tumor and zero for the nodes and met, the tumor is bad.

What do you do? CT scan of the brain.

BR.20. – A 39 year old lady completed her last course of postoperative adjuvant chemotherapy for breast cancer six months ago. She comes to the clinic complaining of constant back pain for about 3 weeks. She is tender to palpation over two well circumscribed areas in the thoracic and lumbar spine.

A variation on the above theme. Now bone mets, instead of brain mets...at least until proven otherwise. What do you do?: The most sensitive test for bone mets is bone scan. If positive, X-Rays are needed to rule out benign reasons for the scan to "light up".

4. OPHTHALMOLOGY

A. Children

EY.1. – A two year old has a huge, pedunculated lipoma hanging out from his right upper eyelid, and obstructing his vision on that eye.

EY.2. – A one year old child is suspected of having strabismus. You verify that indeed the corneal reflection from a bright light in your examining room comes from different places from each of his eyes.

What is the point of these vignettes? - To remind you that the brain “learns” to see what the eyes see during early infancy (up to about age 7). If one eye can not see (any kind of obstruction) or the brain does not like what they see (double vision) the brain will refuse to process the image and that cortical “blindness” will be permanent (the concept of amblyopia).

Management: the problem has to be surgically corrected as early as possible.

EY.3. – A young mother is visiting your office for routine medical care. She happens to have her 18 month old baby with her, and you happen to notice that one of the pupils of the baby is white, while the other one is black.

What is it? – An ophthalmological and potentially life-and-death emergency. A white pupil (leukocoria) at this age can be retinoblastoma. This kid needs to see the ophthalmologist not next week, but today or tomorrow. If it turns out to be something more innocent, like a cataract, the kid still needs it corrected to avoid amblyopia.

EY.4. – Your distant cousins that you have not seen for years visit you and brag about their beautiful baby with “huge, shiny eyes”. They show you a picture that indeed proves their assertion (or the exam booklet will have such a picture).

What is it? - Huge eyes in babies can be congenital glaucoma. Tearing will indeed make them shine all the time. If undiagnosed, blindness will ensue.

B. Adults

EY.5. – A 53 year old lady is in the ER complaining of extremely severe frontal headache. The pain started about one hour ago, shortly after she left the movies where she watched a double feature. On further questioning, she reports seeing halos around the lights in the parking lot when leaving the theater. On physical exam the pupils are mid-dilated, do not react to light, the corneas are cloudy and with a greenish hue, and the eyes feel “hard as a rock”.

What is it? - A classical description of acute glaucoma. Not the most common type (most are asymptomatic...but you can not write a vignette for those), but one that requires immediate Rx.

Management: An ophthalmologist is needed right away...but if you are put in a position to choose treatment, pick Diamox, pilocarpin drops or Mannitol.

EY.6. – A 32 year old lady presents in the E.R. with swollen, red, hot, tender eyelids on the left eye. She has fever and leukocytosis. When prying the eyelids open, you can ascertain that her pupil is dilated and fixed and that she has very limited motion of that left eye.

What is it? - Orbital cellulitis.

Management: Another ophthalmological emergency that requires immediate consultation, but if asked what to do, CT scan will be indicated to assess the extent of the orbital infection and surgical drainage will follow.

EY.7. – A frantic mother reaches you on the phone, reporting that her 10 year old boy accidentally splashed Drano on his face and is screaming in pain complaining that his right eye hurts terribly.

Management: We know that copious irrigation is the main treatment for chemical burns. The point of this vignette is to remind you that time is a key element. If the lady is instructed to bring the boy to the ER, his eye will be cooked to a crisp by the time he arrives. The correct answer here is to instruct the mother to pry the eye open under the cold water tap at home, and irrigate for about ½ hour before she brings the kid to the hospital. You will do more irrigation at the ER, remove solid matter, and eventually re-check pH before the kid goes home.

EY.8. – A 59 year old, myopic gentleman reports “seeing flashes of light” at night, when his eyes are closed. Further questioning reveals that he also sees “floaters” during the day, that they number ten or twenty, and that he also sees a cloud at the top of his visual field.

What is it? - Retinal detachment. One or two floaters would not mean that. More than a dozen is an ominous sign, and that “cloud” at the top of the visual field is hemorrhage settling at the bottom of the eye.

Management: Another ophthalmological emergency. The retina specialist will use laser treatment to “spot weld” the retina back in place.

EY.9. – A 77 year old man suddenly loses sight from the right eye. He calls you on the phone 10 minutes after the onset of the problem. He reports no other neurological symptoms.

What is it? - Embolic occlusion of the retinal artery.

Management: Another ophthalmological emergency...although little can be done for the problem. He has to get the ER instantly and it might help for him to breathe into a paper bag on route, and have someone press hard on his eye and release repeatedly.

EY.10. – A 55 year old man is diagnosed with type two diabetes mellitus. On questioning about eye symptoms he reports that sometimes after a heavy dinner the television becomes blurry and he has to squint to see it clearly.

What is it? - The blurry T.V. is no big deal: the lens swells and shrinks in response to swings in blood sugar...the important point is that he needs to start getting regular ophthalmological follow up for retinal complications. It takes 10 or 20 years for those to develop, but type 2 diabetes may have been present that long before it was diagnosed.

5. GASTROINTESTINAL TRACT

A. Esophagus

GI.1. – A 54 year old obese man gives a history of burning retrosternal pain and “heartburn” that is brought about by bending over, wearing tight clothing or lying flat in bed at night. He gets symptomatic relief from antacids, but the disease process seems to be progressing since it started several years ago.

What is it? - Gastroesophageal reflux, of course (GERD).

Management: Thousands of cases like this are handled with symptomatic medication and no fancy work-up, but the academicians writing questions would want you to recommend endoscopy and biopsies to assess the extent of esophagitis and potential complications.

GI.2. – A 54 year old obese man gives a history of burning retrosternal pain and “heartburn” that is brought about by bending over, wearing tight clothing or lying flat in bed at night. He gets symptomatic relief from antacids, but the disease process seems to be progressing since it started several years ago. Endoscopy shows severe peptic esophagitis and Barrett’s esophagus.

Management: Barrett’s is premalignant. Surgery would be recommended, probably a Nissen Fundoplication.

GI.3 – A 62 year old man describes severe epigastric and substernal pain that he can not characterize well. There is a history suggestive of gastroesophageal reflux, and EKG and cardiac enzymes have been repeatedly negative.

What is it? - The question here is whether retrosternal pain is due to acid reflux or not. The test that you do is an acid perfusion (Bernstein) test, that reproduces the pain when the lower esophagus is irrigated with an acid solution.

GI.4. – A 44 year old black man describes progressive dysphagia that began 3 months ago with difficulty swallowing meat, progressed to soft foods and is now evident for liquids as well. He locates the place where food “sticks” at the lower end of the sternum. He has lost 30 pounds of weight.

What is it? – A classic for carcinoma of the esophagus.

What do you do? – Barium swallow first, then endoscopy and biopsies. CT scan next.

GI.5. – A 47 year old lady describes difficulty swallowing which she has had for many years. She says that liquids are more difficult to swallow than solids, and she has learned to sit up straight and wait for the fluids to “make it through”. Occasionally she regurgitates large amounts of undigested food.

What is it? - Sounds like achalasia.

How do you make the diagnosis? - Manometry studies.

GI.6. – A 24 year old man spends the night cruising bars and drinking heavily. In the wee hours of the morning he is quite drunk and he starts vomiting repeatedly. He initially brings up gastric contents only, but eventually he vomits bright red blood.

What is it? - Mallory Weiss tear of the esophagogastric junction.

Management: Endoscopy to ascertain the diagnosis. Bleeding is typically arterial and brisk, but self-limiting. Photocoagulation may be used if needed.

G.I.7. – A 24 year old man spends the night cruising bars and drinking heavily. In the wee hours of the morning he is quite drunk and starts vomiting repeatedly. Eventually he has a particularly violent episode of vomiting and he feels a very severe, wrenching epigastric and low sternal pain of sudden onset. On arrival at the E.R. one hour later he still has the pain, he is diaphoretic, has fever and leukocytosis and looks quite ill.

What is it? – Boerhave’s syndrome.

How do you confirm the diagnosis? - Gastrographin swallow

Treatment: Emergency surgical repair. Prognosis depends on time elapsed between perforation and treatment.

G.I.8. – A 55 year old man has an upper G.I. endoscopy done as an outpatient to check on the progress of medical therapy for gastric ulcer. Six hours after the procedure, he returns complaining of severe, constant, retrosternal pain that began shortly after he went home. He looks prostrate, very ill, is diaphoretic, has a temperature of 104 and respiratory rate of 30.

What is it? - Instrumental perforation of the esophagus.

Diagnosis and management as in the previous case.

B. Stomach

G.I.9. – A 72 year old man has lost 40 pounds of weight over a two or three month period. He gives a history of anorexia for several months, and of vague epigastric discomfort for the past 3 weeks.

What is it? - Cancer of the stomach.

How do you diagnose it? – Endoscopy and biopsies.

C. Small Bowel and Appendix

G.I.10. – A 54 year old man has had colicky abdominal pain and protracted vomiting for several days. He has developed progressive moderate abdominal distention, and has not had a bowel movement or passed any gas for five days. He has high pitched, loud bowel sounds that coincide with colicky pain, and X-Rays that show distended loops of small bowel and air-fluid levels. Five years ago he had an exploratory laparotomy for a gunshot wound of the abdomen.

What is it? - Mechanical intestinal obstruction, due to adhesions.

Management: Nasogastric suction, I.V. fluids and careful observation.

G.1.1 – A 54 year old man has had colicky abdominal pain and protracted vomiting for several days. He has developed progressive moderate abdominal distention, and has not had a bowel movement or passes any gas for five days. He has high pitched, loud bowel sounds that coincide with the colicky pain, and X-Rays that show distended loops of small bowel and air-fluid levels. Five years ago he had an exploratory laparotomy for a gunshot wound of the abdomen.

What is it? – Mechanical intestinal obstruction, due to adhesions.

Management; Nasogastric suction, I.V. fluids and careful observation.

G.1.11. – A 54 year old man has had colicky abdominal pain and protracted vomiting for several days. He has developed progressive moderate abdominal distention, and has not had a bowel movement or passed any gas for five days. He has high pitched, loud bowel sounds that coincide with the colicky pain, and X-Rays that show distended loops of small bowel and air-fluid levels. Five years ago he had an exploratory laparotomy for a gunshot wound of the abdomen. Six hours after being hospitalized and placed on nasogastric suction and I.V. fluids, he develops fever, leukocytosis, abdominal tenderness and rebound tenderness.

What's happening? - He has strangulated obstruction: i.e., a loop of bowel is dying –or dead- from compression of the mesenteric blood supply.

What does he need? - Emergency surgery.

G.1.12. – A 54 year old man has had colicky abdominal pain and protracted vomiting for several days. He has developed progressive moderate abdominal distention, and has not had a bowel movement or passed any gas for five days. He has high pitched, loud bowel sounds that coincide with the colicky pain, and X-Rays that show distended loops of small bowel and air-fluid levels. On physical exam a groin mass is noted, and he explains that he used to be able to “push it back” at will, but for the past 5 days has been unable to do so.

What is it? – Mechanical intestinal obstruction, due to an incarcerated (potentially strangulated) hernia.

Management: After suitable fluid replacement needs urgent surgical intervention.

G.1.13. – A 55 year old lady is being evaluated for protracted diarrhea. On further questioning she gives a bizarre history of episodes of flushing of the face, with expiratory wheezing. A prominent jugular venous pulse is noted on her neck.

What is it? - Carcinoid syndrome.

How do you diagnose it? - Serum determinations of 5-hydroxy-indoleacetic acid.

G.1.14. – A 22 year old man develops vague periumbilical pain that several hours later becomes sharp, severe, constant and well localized to the right lower quadrant of the abdomen. On physical examination he has abdominal tenderness, guarding and rebound to the right and below the umbilicus. He has a temperature of 99.6 and a WBC of 12,500, with neutrophilia and immature forms.

What is it? – A classic for acute appendicitis.

What does he need? – Exploratory laparotomy and appendectomy.

D. Colon

G.I.15. – A 59 year old is referred for evaluation because he has been fainting at his job where he operates heavy machinery. He is pale and gaunt, but otherwise his physical exam is remarkable only 4+ occult blood in the stool. Lab studies show a hemoglobin of 5.

What is it? - Cancer of the right colon.

How is it diagnosed? - Colonoscopy and biopsies.

Treatment: Blood transfusions and eventually right hemicolectomy.

G.I.16. – A 56 year old man has bloody bowel movements. The blood coats the outside of the stool, and has been constipated, and his stools have become of narrow caliber.

What is it? - Cancer of the distal, left side of the colon.

How is it diagnosed? - Endoscopy and biopsies. If given choices start with flexible sigmoidoscopy.

G.I.17. – A 77 year old man has a colonoscopy because of rectal bleeding. A villous adenoma is found in the rectum and several adenomatous polyps are identified in the sigmoid and descending colon.

The issue with polyps is which ones are pre-malignant, and thus need to be excised, and which ones are benign and can be left alone. Premalignant include, in descending order of malignant conversion: familial polyposis, Gardner's, villous adenoma and adenomatous polyps. Benign include juvenile, Peutz-Jeghers, inflammatory and hyperplastic.

G.I.18. – A 42 year old man has suffered from chronic ulcerative colitis for 20 years. He weights 90 pounds and has had at least 40 hospital admissions for exacerbations of the disease. Due to a recent relapse, he has been placed on high dose steroids and immuran. For the past 12 hours he has had severe abdominal pain, temperature of 104 and leukocytosis. He looks ill, and "toxic". His abdomen is tender particularly in the epigastric area, and he has muscle guarding and rebound. X-Rays show a massively distended transverse colon, and there is gas within the wall of the colon.

What is it? - Toxic megacolon.

Management: Emergency surgery for the toxic megacolon, but the case illustrates many other indications for surgery: chronic malnutrition, "intractability" and risk of developing cancer. The involved colon has to be removed, and that always includes the rectum.

G.I.19. – A 27 year man is recovering from an appendectomy for gangrenous acute appendicitis with perforation and periappendicular abscess. He has been receiving Clindamycin and tobramycin for seven days. Eight hours ago he developed watery diarrhea, crampy abdominal pain fever and leukocytosis.

What is it? - Pseudomembranous colitis from overgrowth of Clostridium Difficile.

How do you diagnose it? - Eventually with stool cultures, but proctosigmoidoscopy can show a typical picture before the cultures are back. Stop the clindamycin, give either Vancomycin or Metronidazole, and avoid lomotil.

E. Anorectal

G1.20. – A 60 year old man known to have hemorrhoids reports bright red blood in the toilet paper after evacuation.

What is it? - Probably bleeding from internal hemorrhoids.

Management: It is not reassurance and hemorrhoid remedies prescribed by telephone. In all these cases, cancer of the rectum has to be ruled out. The correct answer is proctosigmoidoscopic examination.

G.1.21. – A 60 year old man known to have hemorrhoids complains of anal itching and discomfort, particularly towards the end of the day. He has perianal pain when sitting down and finds himself sitting sideways to avoid the discomfort. He is afebrile.

What is it? - External hemorrhoids.

Management: as above: rule out cancer first!

G.1.22. – A 23 year old lady describes exquisite pain with defecation and blood streaks on the outside of the stools. Because of the pain she avoids having bowel movements and when she finally does, the stools are hard and even more painful. Physical examination can not be done, as she refuses to allow anyone to even “spread her cheeks” to look at the anus for fear of precipitating the pain.

What is it? - A classical description of anal fissure.

Management: Even though the clinical picture is classical, cancer still has to be ruled out. Examination under anesthesia is the correct answer. If you are asked what to do next, the currently favored surgical approach is a lateral internal sphincterotomy.

G.1.23. – A 28 year old male is brought to the office by his mother. Beginning four months ago he has had three operations, done elsewhere, for a perianal fistula, but after each one the area has not healed, but actually the surgical wounds have become bigger. He now has multiple unhealing ulcers, fissures all around the anus, with purulent discharge. There are no palpable masses.

What is it? - Another classic. The perianal area has fantastic blood supply and heals beautifully even though feces bathe the wounds. When it does not, you immediately think of Crohn’s disease.

Management: You still have to rule out malignancy. A proper examination with biopsies is needed. The biopsies should diagnose Crohn’s.

G.1.24. – A 44 year old man shows up in the E.R. at 11 PM with exquisite perianal pain. He can not sit down, reports that bowel movements are very painful, and has been having chills and fever. Physical examination shows a hot, tender, red, fluctuant mass between the anus and the ischial tuberosity.

What is it? - Another very common problem: ischiorectal abscess.

Management: The treatment for all abscesses is drainage. This one is no exception. But as always, cancer has to be ruled out. Thus the best option would be an answer that would offer examination under anesthesia and incision and drainage.

G.1.25. – A 62 year old man complains of perianal discomfort, and reports that there are streaks of fecal soiling in his underwear. Four months ago he had a perirectal abscess drained surgically. Physical exam

shows a perianal opening in the skin, and a cord-like tract can be palpated going from the opening towards the inside of the anal canal. Brownish purulent discharge can be expressed from the tract.

What is it? - A pretty good description of a fistula in ano.

Management: First rule out cancer with proctosigmoidoscopy. Then schedule elective fistulotomy.

G.1.26. – A 55-year old, HIV positive man, has a fungating mass growing out of the anus, and rock hard, enlarged lymph nodes on both groins. He has lost a lot of weight, and looks emaciated and ill.

What is it? - Squamous cell carcinoma of the anus.

How to diagnose it? - Biopsies of the fungating mass.

Eventual treatment: Nigro protocol of pre-operative chemotherapy and radiation.

F. GI Bleeding

G.1.27. – A 33 year old man vomits a large amount of bright red blood.

What is it? - Pretty skimpy vignette, but you can already define the territory where the bleeding is taking place: from the tip of the nose to the ligament of Treitz.

How is the diagnosis made?: for all upper G.I. bleeding, start with endoscopy.

G.1.28. – A 33 year old man has had three large bowel movements that he describes as made up entirely of dark red blood. The last one was 20 minutes ago. He is diaphoretic, pale, has a blood pressure of 90 over 70 and a pulse rate of 110.

The point of the vignette is that something needs to be done to define the area from which he is bleeding. With the available information it could be from anywhere in the G.I. tract. The first diagnostic move here is to place a nasogastric tube.

G.1.29. – A 33 year old man has had three large bowel movements that he describes as made up entirely of dark red blood. The last one was 20 minutes ago. He is diaphoretic, pale, has a blood pressure of 90 over 70 and a pulse rate of 110. A nasogastric tube returns copious amounts of bright red blood.

What is it? - Same as if he had been vomiting blood.

G.1.30. – A 33 year old man has had three large bowel movements that he describes as made up entirely of dark red blood. The last one was 20 minutes ago. He is diaphoretic, pale, has a blood pressure of 90 over 70 and a pulse rate of 110. A nasogastric tube returns clear, green fluid without blood.

What is it? - If the NG tube had returned blood, the boundaries would have been tip of the nose to ligament of Treitz. Clear fluid, without bile, would have exonerated the area down to the pylorus, and if there is bile in the aspirate, down to the ligament of Treitz...provided you are sure that the patient is bleeding now. That's the case here. So, he is bleeding from somewhere distal to the ligament of Treitz. Further definition of the actual site is no longer within reach of upper endoscopy, and lower endoscopy is notoriously difficult and unrewarding in massive bleeding. If he is bleeding at more than 2 cc. per minute, emergency angiogram is the way to go.

G.1.31. – A 72 year old man had three large bowel movements that he describes as made up entirely of dark red blood. The last one was two days ago. He is pale, but has normal vital signs. A nasogastric tube returns clear, green fluid without blood.

What is it? - The clear aspirate is meaningless because he is not bleeding right now. So the guilty territory can be anywhere from the tip of the nose to the anal canal. Across the board, $\frac{3}{4}$ of all GI bleeding is upper, and virtually all the causes of lower GI bleeding are diseases of the old: diverticulosis, polyps, cancer and angiodysplasias. So, is old, the overall preponderance of upper is balanced by the concentration of lower causes in old people...so it could be anywhere.

How is the diagnosis made? - Angiography is not the first choice for slow bleeding or bleeding that has stopped. The first choice now is endoscopies, both upper and lower.

G.1.32. – A 7 year old boy passes a large bloody bowel movement.

What is it? - In this age group, Meckel's diverticulum leads the list.

How is the diagnosis made? - By radioactively labeled technetium scan (not the one that tags reds cells, but the one that identifies gastric mucosa).

G.1.33. – A 41 year old man has been in the intensive care unit for two weeks, being treated for idiopathic hemorrhagic pancreatitis. He has had several percutaneous drainage procedures for pancreatic abscesses, chest tubes for pleural effusions, and bronchoscopies for atelectasis. He has been in and out of septic shock and respiratory failure several times. Ten minutes ago he vomited a large amount of bright red blood, and as you approach him he vomits again what looks like another pint of blood.

What is it? - In this setting, it has to be stress ulcer.

Management: It should have been prevented by keeping the pH of the stomach above 4 with H2 blockers, antacids or both; but once the bleeding takes place the diagnosis is made as usual with endoscopy. Treatment will be difficult, and it may require angiographic embolization of the left gastric artery.

G. Acute Abdomen

G.1.34. – A 59 year old man arrives in the E.R. at 2 AM, accompanied by his wife who is wearing curlers on her hair and a robe over her nightgown. He has abdominal pain that began about one hour ago, and is now generalized, constant and extremely severe. He lies motionless in the stretcher, is diaphoretic and has shallow, rapid breathing. His abdomen is rigid, very tender to deep palpation, and has guarding and rebound tenderness in all quadrants.

What is it? - Sort of a generic picture of acute abdomen. The time and circumstances attest to the severity and rapid onset of the problem. The physical findings are impressive. He has generalized acute peritonitis.

Management: The acute abdomen does not need a precise diagnosis to proceed with surgical exploration. Lower lobe pneumonia and myocardial infarction to have to be ruled out with chest X-Ray and EKG, and it would be nice to have a normal amylase...but the best answer for this vignette should be prompt emergency exploratory laparotomy.

G.1.35. – A 62 year old man with cirrhosis of the liver and ascitis, presents with generalized abdominal pain that started 12 hours ago. He now has moderate tenderness over the entire abdomen, with some guarding and equivocal rebound. He has mild fever and leukocytosis.

What is it? - Peritonitis in the cirrhotic with ascitis, or the child with nephrosis and ascitis, could be primary peritonitis – which does not need surgery – rather than the garden-variety acute peritonitis secondary to an intraabdominal catastrophe that requires emergency operation.

How is the diagnosis made? - Cultures of the ascitic fluid will yield a single organism.

Treatment will be with the appropriate antibiotics.

G.1.36. – A 43 year old man develops excruciating abdominal pain at 8:18 PM. When seen in the E.R. at 8:50 PM, he has a rigid abdomen, lies motionless in the examining table, has no bowel sounds and is obviously in great pain, which he describes as constant. X-Ray shows free air under the diaphragms.

What is it? - Acute abdomen plus perforated viscus equals perforated duodenal ulcer in most cases. Although I am exaggerating the “sudden onset” by giving the exact minute, vignettes of perforated peptic ulcer will have a pretty sharp time of onset.

What needs to be done? - Emergency exploratory laparotomy.

G.1.37. – A 44 year old alcoholic male presents with severe epigastric pain that began shortly after a heavy bout of alcoholic intake, and reached maximum intensity over a period of two hours. The pain is constant, radiates straight through to the back and is accompanied by nausea, vomiting and retching. He had a similar episode two years ago, for which he required hospitalization.

What is it? - Acute pancreatitis.

How is it diagnosed? - Serum and urinary amylase and lipase determinations. CT scan if the diagnosis is unclear, or in a day or two if there is no improvement.

Management: NPO, NG suction, IV fluids.

G.1.38. – A 43 year old obese lady, mother of six children, has severe right upper quadrant abdominal pain that began six hours ago. The pain was colicky at first, radiated to the right shoulder and around towards the back, and was accompanied by nausea and vomiting. For the past 2 hours the pain has been constant. She has tenderness to deep palpation, muscle guarding and rebound in the right upper quadrant. Her temperature is 101 and she has a WBC of 16,000. She has had similar episodes of pain in the past, brought about by ingestion of fatty food, but they all had been of brief duration and relented spontaneously or with anticholinergic medications.

What is it? - Acute cholecystitis.

How is the diagnosis made? - Sonogram should be the first choice. If equivocal, an “HIDA” scan (radionuclide excretion scan).

Medical management in most cases will “cool down” the process. Surgery will follow.

G.1.39. – A 52 year old man has right flank colicky pain of sudden onset, that radiates to the inner thigh and scrotum. There is microscopic hematuria.

What is it? - Ureteral colic (included here for differential diagnosis).

How is the diagnosis made? - Urological evaluation always begins with a plain film of the abdomen (a "KUB"). Nowadays sonogram often is the next step, but traditionally it has been intravenous pyelogram (IVP).

G.1.40. – A 59 year old lady has a history of three prior episodes of left lower quadrant abdominal pain for which she was briefly hospitalized and treated with antibiotics. Now she has left lower quadrant pain, tenderness, and a vaguely palpable mass. She has fever and leukocytosis.

What is it? - Acute diverticulitis.

How is the diagnosis made? - CT scan.

Treatment is medical for the acute attack (antibiotics, NPO) but elective sigmoid resection is advisable for recurrent disease (like this lady is having). Emergency surgery (resection or colostomy) may be needed if she gets worse or does not respond to treatment.

G.1.41. – An 82 year old man develops severe abdominal distension, nausea, vomiting and colicky abdominal pain. He has not passed any gas or stool for the past 12 hours. He has a tympanic abdomen with hyperactive bowel sounds. X-Ray shows distended loops of small and large bowel, and a very large gas shadow that is located in the right upper quadrant and tapers towards the left lower quadrant with the shape of a parrot's beak.

What is it? - Volvulus of the sigmoid.

Management: Proctosigmoidoscopy should relieve the obstruction. Rectal tube is another option. Eventually surgery to prevent recurrences could be considered.

G.1.42. – A 79 year old man with atrial fibrillation develops an acute abdomen. He has a silent abdomen, with diffuse tenderness and mild rebound. There is a trace of blood in the rectal exam. He has acidosis and looks quite sick. X-Rays show distended small bowel and distended colon up to the middle of the transverse colon.

What is it? - Acute abdomen in the elderly who has atrial fibrillation, brings to mind embolic occlusion of the mesenteric vessels. Acidosis frequently ensues, and blood in the stool is often seen. Unfortunately not much can be done, as the bowel is usually dead.

G.1.43. – A 53 year old man with cirrhosis of the liver develops malaise, vague right upper quadrant abdominal discomfort and 20 pound weight loss. Physical exam shows a palpable mass that seems to arise from the left lobe of the liver. Alpha fetoprotein is significantly elevated.

What is it? - Probably liver cell carcinoma (hepatoma)

Next move? - CT scan. If confined to one lobe, resection.

G.1.44. – A 53 year old man develops vague right upper quadrant abdominal discomfort and a 20 pound weight loss. Physical exam shows a palpable liver with nodularity. Two years ago he had a right hemicolectomy for cancer of the ascending colon. His carcinoembryonic antigen (CEA) had been within normal limits right after his hemicolectomy, is now ten times normal.

What is it? - Metastasis to the liver from colon cancer.

Next move? – CT scan to ascertain extent. If mets are confined to one lobe, resection may be done. Otherwise, chemotherapy if he has not had it.

G.I.45. – A 24 year old lady develops moderate, generalized abdominal pain of sudden onset, and shortly thereafter faints. At the time of evaluation in the ER he is pale, tachycardic, and hypotensive. The abdomen is mildly distended and tender, and she has a hemoglobin of 7. There is no history of trauma. On inquiring as to whether she might be pregnant, she denies the possibility because she has been on birth control pills since she was 14, and has never misses taking them.

What is it? - Bleeding from a ruptured hepatic adenoma, secondary to birth control pills.

Management: It's pretty clear that she is bleeding into the belly, but a CAT scan will confirm it and probably show the liver adenoma as well. Surgery will follow.

G.I.46. – A 44 year old lady is recovering from an episode of acute ascending cholangitis secondary to choledocholithiasis. She develops fever and leukocytosis and some tenderness in the right upper quadrant. A sonogram reveals a liver abscess.

Not much of a diagnostic challenge here, but the issue is management, and it is included to contrast it with the handling of the patient in the next vignette. This is a pyogenic abscess, it needs to be drained (the radiologists will do it percutaneously).

G.I.47. – A 29 year old migrant worker from Mexico develops fever and leukocytosis, as well as tenderness over the liver when the area is percussed. He has mild jaundice and an elevated alkaline phosphatase. Sonogram of the right upper abdominal area shows a normal biliary tree, and an abscess in the liver.

What is it? - This one is an amebic abscess...very common in Mexico.

Management: Alone among abscesses, this one in most cases does not have to be drained, but can be effectively treated with Metranidazole. Get serology for amebic titers, but don't wait for the report (it will take 3 weeks). Start the patient on Metranidazole. Prompt improvement will tell you that you are on the right tract. When the serologies come back the patient will be well and your diagnosis will be confirmed. Don't fall for an option that suggests aspirating the pus and sending it for culture, you can not grow the ameba from the pus.

H. Jaundice

G.I.48. – A 42 year old lady is jaundiced. She has a total bilirubin of 6 and the laboratory reports that the unconjugated, indirect bilirubin is 6 and the direct, conjugated bilirubin is zero. She has no bile in the urine.

What is it? - The vignette in the exam will be adorned with other evidence of hemolysis, but you do not need it to make the diagnosis. This is hemolytic jaundice.

What do you do next? - Try to figure out what is chewing her red cells.

G.I.49. – A 19 year old college student returns from a trip to Cancun, and two weeks later develops malaise, weakness and anorexia. A week later he notices jaundice. When he presents for evaluation his total bilirubin is 12, with 7 indirect and 5 direct. His alkaline phosphatase is mildly elevated, while the SGOT and SGPT (transaminases) are very high.

What is it? - Hepatocellular jaundice.

Management: Get serologies to confirm diagnosis and type of hepatitis.

G.I.50. – A patient with progressive jaundice which has been present for four weeks is found to have a total bilirubin of 22, with 16 direct and 6 indirect, and minimally elevated SGOT. The alkaline phosphatase was twice normal value couple of weeks ago, and now is about six times the upper limit of normal.

What is it? - A “generic” example of obstructive jaundice.

Next move? - Sonogram, looking for dilated intrahepatic ducts, possibly dilated extrahepatic ducts as well, and if we get lucky a finding of gallstones.

G.I.51.- A 40 year old, obese mother of five children presents with progressive jaundice which she first noticed four weeks ago. She has a total bilirubin of 22, with 16 direct and 6 indirect, and minimally elevated SGOT. The alkaline phosphatase is about six times the upper limit of normal. She gives a history of multiple episodes of colicky right upper quadrant abdominal pain, brought about by ingestion of fatty food.

What is it? - Again obstructive jaundice, with a good chance of being due to stones.

What do you do next? - Start with the sonogram. If you need more tests after that, ERCP is the next move, which could also be used to remove the stones from the common duct.

Cholecystectomy will eventually have to be done.

G.I.52. – A 66 year old man presents with progressive jaundice which he first noticed six week ago. He has a total bilirubin of 22, with 16 direct and 6 indirect, and minimally elevated SGOT. The alkaline phosphatase is about six times the upper limit of normal. He has lost 10 pounds over the past two months, but is otherwise asymptomatic. A sonogram shows dilated intrahepatic ducts, dilated extrahepatic ducts and a very distended, thin walled gallbladder.

What is it? - Malignant obstructive jaundice. “Silent” obstructive jaundice is more likely to be due to tumor. A distended gallbladder is an ominous sign: when stones are the source of the problem, the gallbladder is thick-walled, non-pliable.

What do you do next? - You already have the sonogram. Next move is CAT scan and ERCP.

G.I.53. – A 66 year old man presents with progressive jaundice which he first noticed six weeks ago. He has a total bilirubin of 22, with 16 direct and 6 indirect, and minimally elevated SGOT. The alkaline phosphatase is about six times the upper limit of normal. He is otherwise asymptomatic. A sonogram shows dilated intrahepatic ducts, dilated extrahepatic ducts and a very distended, thin walled gallbladder. Except for the dilated ducts, CT scan is unremarkable. ERCP shows a narrow area in the distal common duct, and a normal pancreatic duct.

What is it? - Malignant, but lucky: probably cholangiocarcinoma at the lower end of the common duct. He could be cured with a pancreatoduodenectomy (Whipple operation).

Next move: get brushings of the common duct for cytological diagnosis.

G.I.54. – A 64 year old lady presents with progressive jaundice which she first noticed two weeks ago. She has a total bilirubin of 12, with 8 direct and 4 indirect, and minimally elevated SGOT. The alkaline phosphatase is about ten times the upper limit of normal. She is otherwise asymptomatic, but is found to be slightly anemic and to have positive occult blood in the stool. A sonogram shows dilated intrahepatic ducts, dilated extrahepatic ducts and very distended, thin walled gallbladder.

What is it? - Again malignant, but also lucky. The coincidence of slowly bleeding into the GI tract at the same time that she develops obstructive jaundice points to an ampullary carcinoma, another malignancy that can be cured with radical surgery.

Next move: Endoscopy.

G.I.55. – A 56 year old man presents with progressive jaundice which he first noticed six weeks ago. He has a total bilirubin of 22, with 16 direct and 6 indirect, and minimally elevated SGOT. He alkaline phosphatase is about eight times the upper limit of normal. He has lost 20 pounds over the past two months, and has a persistent, nagging mild pain deep into his epigastrium and in the upper back. His sister died at age 44 from a cancer of the pancreas. A sonogram shows dilated intrahepatic ducts, dilated extrahepatic ducts and a very distended, thin walled gallbladder.

What is it? - Bad news. Cancer of the head of the pancreas. Terrible prognosis.

How do clinch the diagnosis?: CAT scan –which may show the mass in the head of the pancreas; then ERCP –which will probably show obstruction of both common duct and pancreatic duct.

I. Biliary Tract

G.I.56. – A white, fat, female, aged 40 and mother of five children gives a history of repeated episodes of right upper quadrant abdominal pain brought about by the ingestion of fatty foods, and relieved by the administration of anticholinergic medications. The pain is colicky, radiates to the right shoulder and around to the back, and is accompanied by nausea and occasional vomiting. Physical exam is unremarkable.

What is it? - Gallstones, with biliary colic.

Next move: Sonogram. Elective cholecystectomy will follow.

G.I.57. – A 43 year old obese lady, mother of six children, has severe right upper quadrant abdominal pain that began six hours ago. The pain was colicky at first, radiated to the right shoulder and around towards the back, and was accompanied by nausea and vomiting. For the past 2 hours the pain has been constant. She has tenderness to deep palpation, muscle guarding and rebound in the right upper quadrant. Her temperature is 101 and she has a WBC of 16,000. She has had similar episodes of pain in the past, brought by ingestion of fatty food, but they all had been of brief duration and relented spontaneously or with anticholinergic medications.

What is it? - If you are alert, you will recognize the picture of acute cholecystitis...in fact this is vignette No. G.I.38, that had been presented in the acute abdomen section. It is repeated here to contrast it with the next one.

G.I.58. – A 43 year old obese lady, mother of six children, has severe right upper quadrant abdominal pain that began three days ago. The pain was colicky at first, but has been constant for the past two and a half days. She has tenderness to deep palpation, muscle guarding and rebound in the right upper quadrant. She has temperature spikes to 104 and 105, with chills. Her WBC is 22,000, with a shift to the left. Her bilirubin is 5 and she has an alkaline phosphatase of 2,000 (about 20 times normal). She has had episodes of colicky pain in the past, brought about by ingestion of fatty food, but they all had been of brief duration and relented spontaneously or with anticholinergic medications.

What is it? - Acute ascending cholangitis.

Further test?: The diagnosis is already clear. Sonogram might confirm dilated ducts.

Management: This is an emergency decompression of the biliary tract. To achieve the latter ERCP is the first choice, but PTC (percutaneous transhepatic cholangiogram) is another option.

G.I.59. – A white, fat, female, aged 40 and mother of five children gives a history of repeated episodes of right upper quadrant abdominal pain brought about by the ingestions of fatty foods, and relieved by the administration of anticholinergic medications. The pain is colicky, radiates to the right shoulder and around to the back, and is accompanied by nausea and occasional vomiting. This time she had a shaking chill with the colicky pain, and the pain lasted longer than usual. She has mild tenderness to palpation in the epigastrium and right upper quadrant. Laboratory determinations show a bilirubin of 3.5, an alkaline phosphatase 5 times normal and a serum amylase 3 times normal value.

What is it? - She passed a common duct stone and had a transient episode of cholangitis (the shaking chill, the high phosphatase) and a bit of biliary pancreatitis (the high amylase).

What does she need?: As in many of these cases, start with sonogram. It will confirm the diagnosis of gallstones. If she continues to get well, elective cholecystectomy will follow. If she deteriorates, she may have the stone still impacted at the Ampulla of Vater, and may need ERCP and sphincterotomy to extract it.

J. Pancreas

G.I.60. – A 33 year old, alcoholic male, shows up in the E.R. with epigastric and mid-abdominal pain that began 12 hours ago shortly after the ingestion of a large meal. The pain is constant, very severe, and it radiates straight through to the back. He vomited twice early on, but since then has continued to have retching. He has tenderness and some muscle guarding in the upper abdomen, is afebrile and has mild tachycardia. Serum amylase is 1200, and his hematocrit is 52.

What is it? – Acute edematous pancreatitis.

Management: put the pancreas at rest: NPO, NG suction, IV fluids.

G.I.61. – A 56 year old alcoholic male is admitted with a clinical picture of acute upper abdominal pain. The pain is constant, radiates straight through to the back, and is extremely severe. He has a serum amylase of 800, WBC of 18,000 blood glucose of 150, serum calcium of 6.5 and a hematocrit of 40. He is given IV fluids and kept NPO with NG suction. By the next morning, his hematocrit has dropped to 30 the serum calcium has remained below 7 in spite of calcium administration, his BUN has gone up to 32 and he has developed metabolic acidosis and a low arterial PO₂.

What is it? – He has hemorrhagic pancreatitis. In fact, he is in deep trouble, with at least eight of Ranson's criteria predicting 80 to 100% mortality.

What do you do? Very intensive support will be needed, but the common pathway to death from complication of hemorrhagic pancreatitis frequently is by way of pancreatic abscesses that need to be drained as soon as they appear. Thus serial CT scans will be required.

G.I.62. – A 57 year old alcoholic male is being treated for acute hemorrhagic pancreatitis. He was in the intensive care unit for one week, required chest tubes for pleural effusion, and was on a respirator for several days, but eventually improved enough to be transferred to the floor. Two weeks after the onset of the disease he begins to spike fever and to demonstrate leukocytosis.

What is it? - Pancreatic abscess.

How do we confirm it? - CT scan.

What does he need? - Drainage.

G.I.63. – A 49 year old alcoholic male presents with ill-defined upper abdominal discomfort and early satiety. On physical exam he has a large epigastric mass that is deep within the abdomen, and actually hard to define. He was discharged from the hospital 5 weeks ago, after successful treatment for acute pancreatitis.

What is it? - Pancreatic pseudocyst.

Management: You could diagnose it on the cheap with a sonogram, but CT scan is probably the best choice. It will need to be drained, and the radiologist will do it with CT guidance. An older option was to operate and anastomose the pseudocyst to the GI tract.

G.I.64. – A 55 year old lady presents with vague upper abdominal discomfort, early satiety and a large but ill-defined epigastric mass. Five weeks ago she was involved in an automobile accident where she hit the upper abdomen against the steering wheel.

What is it? - Again pancreatic pseudocyst, in this case secondary to trauma rather than as a sequela of pancreatitis.

Management is the same as in the previous case.

G.I.65. – A disheveled, malnourished individual shows up in the emergency room requesting medication for pain. He smells of alcohol and complains bitterly of constant epigastric pain, radiating straight through to the back that he says he has had for several years. He has diabetes, steatorrhea and calcifications in the upper abdomen in a plain X-Ray.

What is it? - Chronic pancreatitis.

I hope they ask you to recognize this vignette, but not to manage it. There is precious little that can be done for these unfortunate individuals. Stopping the alcoholic intake is the first step (easier said than done). Replacement of pancreatic enzymes and control of the diabetes are obvious needs, but the pain is most difficult to eradicate. Various operations can be done and those would be guided by the anatomy of the pancreatic ducts, thus if forced to go further diagnostic test, pick ERCP.

K. Miscellaneous

G.I.67. – On the first post-operative day after an open cholecystectomy, a patient has a temperature of 101.

What is it? - Atelectasis.

Management: Listen to the chest, chest X-Ray, encourage deep breathing and coughing.

G.I.68. – On the third post-operative day after an open cholecystectomy, a patient develops a temperature of 101.

What is it? - Urinary tract infection.

Management: Urinalysis, Urinary culture, appropriate antibiotics.

G.I.69. – On the fourth post-operative day after an open cholecystectomy, a patient develops a temperature of 101. There is tenderness to deep palpation in the calf, particularly when the foot is dorsiflexed.

What is it? - Deep venous thrombosis.

Management: Duplex ultrasound (Doppler flow plus real time B-mode) to confirm diagnosis.
Anticagulation to prevent thrombus propagation.

G.I.70. – Seven days after an inguinal hernia repair, a patient returns to the clinic because of fever. The wound is red, hot and tender.

What is it? - Wound infection.

Management: Open the wound, drain the pus, pack it open.

G.I.71. – Two weeks after an open cholecystectomy a patient develops fever and leukocytosis. The wound is healing well and does not appear to be infected.

What is it? - A deep abscess. Two locations are prime suspects: subphrenic or subhepatic. Had the operation been an appendectomy, pelvic abscess would be the first pick.

Management: CT scan to find the abscess and to guide the radiologist for the percutaneous drainage.

G.I.72. – On the fifth post-operative day after a right hemicolectomy for cancer, the dressings covering the midline abdominal incision are found to be soaked with a clear, pinkish, salmon-colored fluid.

What is it? - Wound dehiscence.

Management: Keep the patient in bed, tape his belly together and schedule surgery for re-closure of the wound if the patient can take the re-operation. If too sick, the development of a ventral incisional hernia may have to be accepted now and repaired later. On the other hand, if following the discovery of the copious, salmon colored, pinkish clear fluid, the patient gets out of bed, or sneezes forcefully, you may be confronted with a bucket-full of small bowel. Evisceration has taken place. In that case, keep the bowel covered and moist with sterile dressings, and rush the patient to the OR for re-closure.

6. ENDOCRINE

EN.1. – A 62 year old lady was drinking her morning cup of coffee at the same time she was applying her makeup, and she noticed in the mirror that there was a lump in the lower part of her neck, visible when she swallowed. She consult you for this and on physical exam you ascertain that she indeed has a dominant, 2 cm. mass on the left lobe of her thyroid as well as two smaller masses on the right lobe. They are all soft and she has no palpable lymph nodes in the neck.

Management: Most thyroid nodules are benign, and surgical removal to ascertain the diagnosis is a big operation...thus surgery has to be reserved for selected cases. Worrisome features include: young, male, single nodule, history of radiation to the neck, solid mass on sonogram and cold nodule on scan. In center with sufficient experience, the last two tests are omitted in preference for fine needle aspiration and cytology. This case does not sound malignant, but you can not be sure. If given the option among the answers, go for the FNA.

EN.2. – A 21 year old college student is found on a routine physical examination to have a single, 2 cm. nodule in the thyroid gland. The young man had radiation to his head and neck when he was thirteen years old because of persistent acne. His thyroid function tests are normal.

Management: This one will need surgery, but if offered FNA is still your first answer.

EN.3. – A 44 year old lady has a palpable mass in her thyroid gland. She also describes losing weight in spite of a ravenous appetite, palpitations and heat intolerance. She is a thin lady, fidgety and constantly moving, with moist skin and a pulse rate of 105.

What is it? – A “hot” adenoma.

Management: confirm hyperthyroidism by measuring free T4. Confirm source of the excessive hormone with radioactive iodine scan. Do surgery after Beta blocking.

EN.4. – A 22 year old male has a 2 cm. round firm mass in the lateral aspect of his neck, which has been present for four months. Clinically this is assumed to be an enlarged jugular lymph node and it is eventually removed surgically. The pathologist reports that the tissue removed is normal thyroid tissue.

What is it? - There is no such thing as “lateral aberrant thyroid”. This is metastatic follicular carcinoma from an occult primary in the thyroid gland.

Management: Look for the primary with a thyroid scan. Eventually surgery.

EN.5. – An automated blood chemistry panel done during the course of a routine medical examination indicates that an asymptomatic patient has a serum calcium of 12.1 in a lab where the upper limit of normal is 9.5. Repeated determinations are consistently between 10.5 and 12.6. Serum phosphorus is low.

What is it? - Parathyroid adenoma.

How is the diagnosis made? - Had this question been written 20 years ago, the vignette would have described a patient with a disease of “stones and bones and abdominal groans”, and you would have cleverly asked for a serum calcium as your first test. Nowadays most parathyroid adenomas are identified when they are still asymptomatic, because of the widespread use of automated blood chemistry panels. Across the board most cases of hypercalcemia are due to metastatic cancer, but that would not be the case

on asymptomatic people. Your next move here is PTH determination and sestimibi scan to localize the adenoma. Surgery will follow.

EN.6. – A 32 year old woman is admitted to the psychiatry unit because of wild mood swings. She is found to be hypertensive and diabetic and to have osteoporosis. (she had not been aware of such diagnosis beforehand). It is also ascertained that she has been amenorrheic and shaving for the past couple of years. She has gross centripetal obesity, with moon facies and Buffalo hump, and thin, bruised extremities. A picture from 3 years ago shows a person of very different, more normal appearance.

What is it? - Cushings. The appearance is so typical, that you will probably be given a photograph on the test, with an accompanying brief vignette. The presenting symptom may be any one of those listed.

How is the diagnosis made? - Start with AM and PM cortisol determinations. Later she will get dexamethasone suppression tests and MRI) of the head looking for the pituitary microadenoma, which will eventually be removed by the trans-nasal, trans-sphenoidal route.

EN.7. – A 28 year old lady has virulent peptic ulcer disease. Extensive medical management including eradication of H.Pylori fails to heal her ulcers. She has several duodenal ulcers in the first and second portions of the duodenum. She has watery diarrhea.

What is it? - Gastrinoma (Zollinger-Ellison).

How is the diagnosis made? - Start by measuring serum gastrin. Later CT scans (or MRI) of the pancreas looking for the tumor, and surgery to remove it.

EN.8. – A second year medical student is hospitalized for a neurological work-up for a seizure disorder of recent onset. During one of his convulsions it is determined that his blood sugar is extremely low. Further work-up shows that he has high levels of insulin in the blood with low levels of C-peptide.

What is it? - Exogenous administration of insulin. If the C-peptide had been high along with the insulin level, the diagnosis would have been insulinoma.

Management: In this case, psychiatric evaluation and counseling (He is faking the disease to avoid taking the USMLE). If it had been insulinoma, CT scan or MRI looking for the tumor in the pancreas, to be subsequently removed surgically.

EN.9. – A 48 year old lady has had severe, migratory necrolytic dermatitis for several years, unresponsive to all kinds of “herbs and unguents”. She is thin, has mild stomatitis and mild diabetes mellitus.

What is it? - Glucagonoma.

How is the diagnosis made? - Determine glucagon levels. Eventually CT scan or MRI looking for the tumor in the pancreas. Surgery will follow. If inoperable, somatostatin can help symptomatically and streptozocin is the indicated chemotherapeutic agent.

7. SURGICAL HYPERTENSION

HT.1. – A 45 year old lady comes to your office for a “regular checkup”. On repeated determinations you confirm the fact that she is hypertensive. When she was in your office three years ago, her blood pressure was normal. Laboratory studies at this time show a serum sodium of 144 mEq/L, a serum bicarbonate of 28 mEq/L, and a serum potassium concentration of 2.1 mEq/L. The lady is taking no medications of any kind.

What is it? - Hyperaldosteronism. Possibly adenoma.

How is the diagnosis made? - Start with determinations of aldosterone and renin levels. If confirmatory (aldo high, renin low) proceed with determinations lying down and sitting up, to differentiate hyperplasia (not surgical) from adenoma (surgical). Treat the first with aldactone. Pursue the second with imaging studies (CT scan or MRI) and surgery.

ET. 2. – A thin, hyperactive 38 year old lady is frustrated by the inability of her physicians to help her. She has episodes of severe pounding headache, with palpitations, profuse perspiration and pallor, but by the time she gets to her doctor’s office she checks out normal in every respect.

What is it? – Suspect pheochromocytoma.

How to diagnose it? - Start with 24 hr. urinary determination of metanephrine and VMA (Vanillylmandelic acid). Follow with CT scan of adrenal glands. Surgery will eventually be done, with careful pharmacological preparation with alpha-blockers.

HT.3. – A 17 year old man is found to have a blood pressure of 190/115. This is checked repeatedly in both arms and it is always found to be elevated, but when checked in the legs it is found to be normal.

What is it? - Coarctation of the aorta.

Further testing; start with a chest X-Ray, looking for scalloping of the ribs. Eventually aortogram and ultimately surgery.

HT.4. – A 23 year old lady has had severe hypertension for two years, and she does not respond well to the usual medical treatment for that condition. A bruit can be faintly heard over her upper abdomen.

What is it? - Renovascular hypertension due to fibromuscular dysplasia.

Management: I hope they only ask you to identify this one in an extended matching set. How to proceed with the diagnosis is a can of worms. There are a million tests, mostly invasive and expensive, and none with clear-cut reliability. Eventually arteriogram will precede surgical correction (or balloon dilatation).

HT.5. – A 72 year old man with multiple manifestations of arteriosclerotic occlusive disease has hypertension of relatively recent onset, and refractory to the usual medical therapy. He has a faint bruit over the upper abdomen.

What is it? - Renovascular hypertension due to arteriosclerotic plaque at the origin of the renal artery...or arteries (this is usually bilateral). I hope you are not asked to manage it. To the problems outline above, add the difficult, equation of guessing which manifestation of his arteriosclerotic disease is going to kill him first.

8. PEDIATRIC SURGERY

A. At Birth – First 24 Hours

PD.1. – Within eight hours after birth, it is noted that a baby has excessive salivation. A small, soft nasogastric tube is inserted and the baby is taken to X-Ray to have a “babygram” done. The film shows the tube coiled back upon itself in the upper chest. There is air in the gastrointestinal tract.

What is it? – Tracheo-esophageal fistula, the most common type with proximal blind esophageal pouch and distal TE fistula.

Management: first, rule out the associated anomalies (“VACTER”: vertebral, anal, cardiac, TE and renal/radial). The vertebral and radial will be seen in the same X-ray you already took, you need echo for the heart, sonogram for the kidneys and physical exam for the anus. Then off to surgery.

PD.2. – A newborn baby is found on physical exam to have an imperforate anus.

Management: This is part of the “VACTER” group, so look for the others as mentioned above. For the imperforate anus, look for a fistula nearby (to the vagina in little girls, to the perineum in little boys), which will help determine the level of the blind pouch and the timing and type of surgery (primary repair versus colostomy and repair later).

PD.3. – A newborn baby is noted to be tachypneic, cyanotic and grunting. The abdomen is scaphoid and there are bowel sounds heard over the left chest. An X-Ray confirms that there is bowel in the left thorax. Shortly thereafter, the baby develops significant hypoxia and acidosis.

What is it? - Congenital diaphragmatic hernia.

Management: The main problem is the hypoplastic lung. It is better to wait 36 to 48 hours to do surgery to allow transition from fetal circulation to newborn circulation. Meanwhile the trick is to keep the kid alive with endotracheal intubation, hyperventilation (careful not to blow up the other lung), sedation and NG suction.

PD.4. – At the time of birth it is noted that a child has a large abdominal wall defect to the right of the umbilicus. There is a normal cord, but protruding from the defect there is a matted mass of angry looking, edematous bowel loops.

What is it? - Gastroschisis.

Medical school professors love to emphasize differential diagnosis of somewhat similar problems. The issue with abdominal wall defects, is which one is the gastroschisis and which one is the omphalocele. Chances are all you’ll be expected to do is to identify the correct one. Management is intuitive: you got to get those chitlins back into the belly, and the technical detail are best left to the pediatric surgeons. They will be on the look-out for atresias, which these babies can have, and they may need to use a silicon “silo” to gradually close the abdominal wall defect.

PD.5. – A newborn baby is noted to have a shiny, thin, membranous sac at the base of the umbilical cord. Inside the sac one can see part of the liver, and loops of normal looking bowel.

What is it? - This one is the omphalocele.

Management: These kids can have a host of other congenital defects. After those are looked for, repair is as noted above.

PD.6. – A newborn is noted to have a moist medallion of mucosae occupying the lower abdominal wall, above the pubis and below the umbilicus. It is clear that urine is constantly bathing this congenital anomaly.

What is it? - Exstrophy of the urinary bladder.

What's the point of the vignette? - These are very rare anomalies that only very highly specialized centers can repair. The problem is that unless the repair is within the first 48 hours, it will not have a good chance to succeed. It takes time to arrange for transfer of a newborn baby to a distant city. If a day or two are wasted before arrangements are made, it will be too late.

PD.7. – Half an hour after the first feed, a baby vomits greenish fluid. The mother had polyhydramnios and the baby has Down's syndrome. X-Ray shows a "double bubble sign": a large air fluid level in the stomach, and smaller one in the first portion of the duodenum. There is no gas in the rest of the bowel.

What is it? - It can be two things, but first some general points. Kids vomit, bur and regurgitate all the time (ask any parent), but the innocent vomit is clear-whitish. Green vomiting in the newborn is bad news. It means something serious. The two conditions that this could be are duodenal atresia and annular pancreas

Management: with complete obstruction, emergency surgery will be needed, but these kids have lots of other congenital anomalies, look for them first.

PD.8. – Half an hour after the first feed, a baby vomits greenish fluid. X-Ray shows a double bubble sign": a large air fluid level in the stomach, and a smaller one in the first portion of the duodenum. There is air in the distal bowel, beyond the duodenum, in loops that are not distended.

What is it? - Now you have three choices: it could be incomplete obstruction from duodenal stenosis or annular pancreas, or it could be malrotation.

Management: If you are dealing with incomplete obstruction you have time to do what's needed, i.e. it is a lesser emergency. But if it is malrotation the bowel could twist and die, so that one is super-emergency. How can you tell? Do a contrast enema, and if not diagnostic order a water-soluble (gastrographin) upper GI study.

PD.9. – A newborn baby has repeated green vomiting during the first day of life, and does not pass any meconium. Except for abdominal distention, the baby is otherwise normal. X-Ray shows multiple air fluid levels and distended loops of bowel.

What is it? - Intestinal atresia.

Management: This one is due to a vascular accident in utero, thus there are no other congenital anomalies to look for, but there may be multiple points of atresia.

B. A Few Days Out –Within First Month or Two

PD.10. – A very premature baby develops feeding intolerance, abdominal distention and a rapidly dropping platelet count.. The baby is four days old, and was treated with indomethacin for a patent ductus.

What is it? - Necrotizing enterocolitis.

Management: Stop all feedings, broad spectrum antibiotics, IV fluids/nutrition. Surgical intervention if they develop abdominal wall erythema, air in the biliary tree or pneumoperitoneum.

PD.11. – A three day old, full term baby is brought in because of feeding intolerance and bilious vomiting. X-Ray shows multiple dilated loops of small bowel and a “ground glass” appearance in the lower abdomen. The mother has cystic fibrosis.

What is it? - Meconium ileus.

Management: Gastrografin enema may be both diagnostic and therapeutic, so it is the obvious first choice. If unsuccessful, surgery may be needed. The kid has cystic fibrosis, and management of the other manifestations of the disease will also be needed.

PD.12. – A three week old baby has had “trouble feeding” and it is not quite growing well. he now has bilious vomiting and is brought in for evaluation. X-Ray shows a classical “double bubble”, along with normal looking gas pattern in the rest of the bowel.

What is it? - Malrotation. The vignette is repeated here because not all of them will show up on day one. They can “twist” at any time later.

You know what to do: contrast enema to verify the malrotation and emergency surgery.

PD.13. – A 3 week old first-born, full term baby boy began to vomit three days ago. The vomiting is projectile, has no bile in it, follows each feeding and the baby is hungry and eager to eat again after he vomits. He looks somewhat dehydrated and has visible gastric peristaltic waves and a palpable “olive size” mass in the right upper quadrant.

What is it? Hypertrophic pyloric stenosis.

Management: Check electrolytes: hypokalemic, hypochloremic metabolic alkalosis may have developed. Correct it, rehydrate and do Ramsted Pyloromyotomy.

PD.14. – An 8 week old baby is brought in because of persistent, progressively increasing jaundice. The bilirubin is significantly elevated and about two thirds of it is conjugated, direct bilirubin. Ultrasound rules out extrahepatic masses, serology is negative for hepatitis and sweat test is normal.

What is it? - Biliary atresia.

Management: HIDA scan, percutaneous liver biopsy and exploratory laparotomy.

PD.15. – A two month old baby boy is brought in because of chronic constipation. The kid has abdominal distention, and plain X-Rays show gas in dilated loops of bowel throughout the abdomen. Rectal exam is followed by expulsion of stool and flatus, with remarkable improvement of the distention.

What is it? - Hirschsprung’s disease (aganglionic megacolon)

How do you diagnose it? - Barium enema will define the normal-looking aganglionic distal colon and the abnormal-looking thickness biopsy of the rectal mucosa.

C. Later in Infancy

PD.16. – A 9 month old, chubby, healthy looking little boy has episodes of colicky abdominal pain that make him double up and squat. The pain lasts for about one minute, and the kid looks perfectly happy and normal until he gets another colick. Physical exam shows a vague mass on the right side of the abdomen, an “empty” right lower quadrant and currant jelly stools.

What is it? - Intussusception.

Management: Barium enema is both diagnostic and therapeutic in most cases. It should be your first choice. If reduction is not achieved radiologically, exploratory laparotomy and manual reduction will be needed.

PD.17. – A one year old baby is referred to the University Hospital for treatment of a subdural hematoma. In the admission examination it is noted that the baby has retinal hemorrhages.

PD.18. – A three year old girl is brought in for treatment of a fractured humerus. The mother relates that the girl fell from her crib. X-Rays show evidence of other older fractures at various stages of healing in different bones.

PD.19. – A one year old child is brought in with second degree burns of both buttocks. The stepfather relates that the child fell into a hot tub.

What are these? - Classical vignettes of child abuse. Notify the proper authorities.

PD.20. – A 7 year old boy passes a large bloody bowel movement.

What is it? - Meckel’s diverticulum.

Do a radioisotope scan looking for gastric mucosa in the lower abdomen.

9. OTOLARYNGOLOGY

A. Neck Masses - Congenital

OT.1. – A 15 year old girl has a round, 1 cm. cystic mass in the midline of her neck at the level of the hyoid bone. When the mass is palpated at the same time that the tongue is pulled, there seems to be a connection between the two. The mass has been present for at least 10 years, but only recently bothered the patient because it got infected and drained some pus.

What is it? - Thyroglossal duct cyst.

Management: - Sistrunk operation (removal of the mass and the track to the base of the tongue, along with the medial segment of the hyoid bone).

OT.2. – An 18 year old woman has a 4c., fluctuant round mass on the side of her neck, just beneath and in front of the sternomastoid. She reports that it has been there at least 10 years, although she thinks that it has become somewhat larger in the last year or two. A CT scan shows the mass to be cystic.

What is it? - A branchial cleft cyst.

Management: Elective surgical removal.

OT.3. – A 6 year old child has a mushy, fluid filled mass at the base of the neck, that has been noted for several years. The mass is about 6 cm. in diameter, occupies most of the supraclavicular area and seems by physical exam to go deeper into the neck and chest.

What is it? - Cystic hygroma.

Management: Get a CT scan to see how deep this thing goes. They can extend down into the chest and mediastinum. Surgical removal will eventually be done.

B. Neck Masses – Inflammatory vs. Neoplastic

OT.4.- A 22 year old lady notices an enlarged lymph node in her neck. The node is in the jugular can, measures about 1.5 cm, is not tender, and was discovered by the patient yesterday. The rest of the history and physical exam are unremarkable.

What is it? - It's large lymph node...and that's all we know so far. These could be inflammatory (the vast majority) or neoplastic (the rare ones that need something done). So, how do we tell?

Management: before you spend a ton of money doing a million tests, let time be your ally. Schedule the patient to be rechecked in three weeks. If the node has gone away by then, it was inflammatory and nothing further is needed. If it's still there, it could be neoplastic and something needs to be done. Three weeks of delay will not significantly impact the overall course of a neoplastic process.

OT.5. – A 22 year old lady seeks help regarding an enlarged lymph node in her neck. The node is in the jugular chain, measures about 2cm, is firm, not tender, and was discovered by the patient six weeks ago.

There is a history of low grade fever and night sweats for the past three weeks. Physical examination reveals enlarged lymph nodes in both axillas and in the left groin.

What is it? - Lymphoma most likely.

Management: Tissue diagnosis will be needed. You can start with FNA of the available nodes, but eventual node biopsy will be needed to establish not only the diagnosis but also the type of lymphoma.

OT.6. – A 72 year old man has 4 cm. hard mass in the left supraclavicular area. The mass is movable, non tender and has been present for three months. The patient has had a 20 pound weight loss in the past two months, but is otherwise asymptomatic.

What is it? - Malignant mets to a supraclavicular node from a primary tumor below the neck.

How do we make the diagnosis? - Look for the obvious primary tumors: lung, stomach, colon, pancreas, kidney. The node itself will eventually be biopsied.

OT.7. – A 69 year old man who smokes and drinks and has rotten teeth has a hard, fixed, 4 cm. mass in his neck. The mass is just medial and in front of the sternomastoid muscle, at the level of the upper notch of the Thyroid cartilage. It has been there for at least six months, and it is growing.

What is it? – Metastatic squamous cell carcinoma to a jugular chain node, from a primary in the mucosa of the head and neck (oro-pharyngeal-laryngeal territory).

Management: Don't biopsy the node! FNA is OK, but the best answer is to do a triple endoscopy (examination under anesthesia of the mouth, pharynx, larynx, esophagus and tracheobronchial tree).

C. Squamous Cell Cancer – Other Presentations

OT.8. – A 69 year old man who smokes and drinks and has rotten teeth has hoarseness that has persisted for six weeks in spite of antibiotic therapy.

OT.10. – A 69 year old man who smokes and drinks and has rotten teeth has a painless ulcer in the floor of the mouth that has been present for 6 weeks and has not healed.

OT.11. – A 69 year old man who smokes and drinks and has rotten teeth has unilateral ear ache that has not gone away in 6 weeks. Physical examination shows serious otitis media on that side, but not on the other.

What is it? - These are all different ways for squamous cell carcinoma of the mucosa of the head and neck to show up. They all need triple endoscopy to find and biopsy the primary tumor and to look for synchronous second primaries.

D. Other Tumors – Adults

OT.12. – A 52 year old man complains of hearing loss. When tested he is found to have unilateral sensory hearing loss on one side only. He does not engage in any activity (such as sport shooting) that would subject that ear to noise that spares the other side.

What is it? - Unilateral versions of common ENT problems in the adult suggest malignancy. In this case, acoustic nerve neuroma. Note that if the hearing loss had been conductive, a cerumen plug would be the obvious first diagnosis.

How is it diagnosed? MRI looking for the tumor.

OT.13. – A 56 year old man develops slow, progressive paralysis of the facial nerve on one side. It took several weeks for the full blown paralysis to become obvious, and it has been present now for three months. It affects both the forehead as well as the lower face.

What is it? - Gradual, unilateral nerve paralysis suggests a neoplastic process.

Work-up: Gadolinium enhanced MRI.

OT.14. – A 45 year old man presents with a 2 cm. firm mass in front of the left ear, which has been present for four months. The mass is deep to the skin and it is painless. The patient has normal function of the facial nerve.

What is it? - Pleomorphic adenoma (mixed tumor) of the parotid gland.

How is it diagnosed? – FNA is appropriate, but the point of the question will be to bring out the fact that parotid masses are never biopsied in the office or under local anesthesia. Look for the option that offers referral to a head and neck surgeon for formal superficial parotidectomy.

OT.15. – A 65 year old man present with a 4 cm. hard mass in front of the left ear, which has been present for six months. The mass is deep to the skin and it is fixed. He has constant pain in the area, and for the past two months has had gradual progression of left facial nerve paralysis. He has rock-hard lymph nodes in the left neck.

What is it? - Cancer of the parotid gland.

Management: same as above. Amateurs should not mess with parotid.

E. Pediatric ENT

OT.16. – A two year old by has unilateral ear ache.

OT.17. – A two year old has unilateral foul smelling purulent rhinorrhea.

OT.18. – A two year old has unilateral wheezing and the lung on that side looks darker on X-Rays (more air) than the other side.

What is it? - Unilateral versions of common bilateral ENT conditions in toddlers suggest foreign body.

Appropriate X-Rays, physical examination or endoscopies and extraction –typically under anesthesia.

F. Emergencies and Miscellaneous

OT.19. – A 4 year old child is brought by his mother to the emergency room because “she is sure that he must have swallowed a marble”. The kid was indeed playing with marbles and apparently completely healthy when he was put to bed, but four hours later he had developed inspiratory stridor, a fever of 103 and obvious respiratory distress. The kid is sitting up, leaning forward, drooling at the mouth and looking very sick indeed.

What is it? – Acute epiglottitis.

Management: A real emergency where expert help is needed! The diagnosis is confirmed with lateral X-rays of the neck, but be sure experts go with the kid to the X-Ray dept., ready to use bag and mask if needed. Then it’s off to the OR for nasotracheal intubation. If bradychardia develops, the kid is in real trouble: atropine will help, but hypoxia is the problem. Along the way, start IV antibiotics for H.Influenzae.

OT.20. – A 45 year old lady with a history of a recent tooth infection shows up with a huge, hot, red, tender, fluctuant mass occupying the left lower side of her face and upper neck, including the underside of the mouth. The mass pushes up the floor of the mouth on that side. She is febrile.

What is it? – Ludwigs’ Angina. (An abscess of the floor of the mouth)

Management: Tracheostomy and incision drainage of the abscess.

OT.21. – A 29 year old lady calls your office at 10 AM with the history that she woke up that morning with one side of her face paralyzed.

What is it? - Bell’s palsy.

Management: The latest trend is to start these patients right away on anti-viral medication. Pick that answer if offered. If the question has been lingering in the item pool for years, the correct choice will be that the process is idiopathic and will resolve spontaneously in most cases.

OT.22. – A patient with multiple trauma from a car accident is being attended to in the emergency room. As multiple invasive things are done to him, he repeatedly grimaces with pain. The next day it is noted that he has a facial nerve paralysis on one side.

What is it? – Trauma to the temporal bone can certainly transect the facial nerve, but when that happens the nerve is paralyzed right there and then. Paralysis appearing late is from edema. The point of the vignette is that nothing needs to be done.

OT.23. – Your office receives a phone call from Mrs. Rodriguez. You know this middle aged lady very well because you have repeatedly treated her in the past for episodes of sinusitis. In fact, six days ago you started her on decongestants and oral antibiotics for what you diagnoses as frontal and ethmoid sinusitis. Now she tells you over the phone that ever since she woke up this morning, she has been seeing double.

What is it? - Cavernous sinus thrombosis, or orbital cellulitis.

Management: This is a real emergency. She needs immediate hospitalization, high dose IV antibiotic treatment and surgical drainage of the paranasal sinuses or the orbit. A CT scan will be needed to guide the surgery, but I expect that the thrust of the question will be directed at your recognition of the serous nature of this problem, rather than the therapy.

OT.24. – A 10 year old girl has epistaxis. Her mother says that she picks her nose all the time.

What is it? - Bleeding from the anterior part of the septum.

Management: Phenylephrine spray and local pressure.

OT.25. – An 18 year old boy has epistaxis. The patient denies picking his nose. No source of anterior bleeding can be seen by physical examination.

What is it? - Either septal perforation from cocaine abuse, or posterior juvenile nasopharyngeal angiofibroma.

Management: Get your ENT friends to take care of this one. You can not do it.

OT.26. – A 72, hypertensive male, on aspirin for arthritis, has a copious nosebleed. His blood pressure is 220/15 when seen in the E.R. He says he began swallowing blood before it began to come out through the front of his nose.

What is it? - Obviously epistaxis secondary to hypertension.

Management: These are serious problems that can end up with death. Medical Rx. To lower the blood pressure is clearly needed, and may be the option offered in the answers, but getting the ENT people right away should also be part of the equation.

OT.27. – A 57 year old man seeks help for “dizziness”. On further questioning he explains that he gets light and work-up in that direction.

OT.28. – A 57 year old man seeks help for “dizziness”. On further questioning, he explains that the room spins around him.

What is it? - This one is in the vestibular apparatus. I could not even begin to tell you how to work it up, but seek the answers that look like either symptomatic treatment (meclizine, phenergan, diazepam), or an ENT workup.

10. CARDIOTHORACIC

A. Congenital Heart

CT.1. – During a school physical exam, a 12 year old girl is found to have a heart murmur. She is referred for further evaluation. An alert cardiology fellow recognized that she indeed has a pulmonary flow systolic murmur, but he also notices that she has a fixed split second heart sound. A history of frequent colds and upper respiratory infections is elicited.

What is it? - Atrial septal defect.

Management: Echocardiography to establish the diagnosis. Surgical closure of the defect. Closure by way of catheterization is still experimental.

CT.2. – A three month old boy is hospitalized for ‘failure to thrive’. He has a loud, pansystolic heart murmur best heard at the left sternal border. Chest X-Ray shows increased pulmonary vascular markings.

What is it? - Ventricular septal defect.

Management: Echocardiography and surgical correction.

CT.3. – A three day old premature baby has trouble feeding and pulmonary congestion. Physical exam shows bounding peripheral pulses and a continuous, machinery-like heart murmur.

What is it? - Patent ductus arteriosus.

Management: Echocardiography and surgical closure or indomethacin.

CT.4. – A patient known to have a congenital heart defect requires extensive dental work.

Pretty brief vignette, but the point is that somewhere along the line, you might be expected to remember that these patients need antibiotic prophylaxis for subacute bacterial endocarditis.

CT.5. – A 6 year old boy is brought to the U.S. by his new adoptive parents, from an orphanage in Eastern Europe. The kid is small for his age, and has a bluish hue in the lips and tips of his fingers. He has clubbing and spells of cyanosis relieved with squatting. He has a systolic ejection murmur in the left third intercostal space. Chest X-Ray shows a small heart, and diminished pulmonary vascular markings. EKG shows right ventricular hypertrophy.

What is it? - Tetralogy of Fallot. Cyanotic kids could have any of the 5 conditions that begin with the latter “T”: Tetralogy or Transposition of the great vessels, which are common; or Truncus arteriosus, Total anomalous pulmonary venous connection or Tricuspid atresia, which are rare. If the kid went home after birth, and later was found to be cyanotic, bet on tetralogy. If he was blue from the moment of birth, bet on transposition.

Management: Even if all you can recognize in the vignette is that a child has cyanosis, start with an Echocardiogram as a good diagnostic test. The intricate details of surgical correction, and the need the surgeons might have for cardiac catheterization prior to surgery are bound to be beyond the level of knowledge expected of you in this examination.

B. Acquired Heart Disease

CT.6. – A 72 year old man has a history of angina and exertional syncopal episodes. He has a harsh midsystolic heart murmur best heard at the second intercostal space and along the left sternal border.

What is it? - Aortic stenosis.

Management: The diagnostic test is echocardiogram. Surgical valvular replacement is indicated if there is a gradient of more than 50 mm.Hg., or at the first indication of congestive heart failure, angina or syncope.

CT.7. – A 72 year old man has been known for years to have a wide pulse pressure and a blowing, high-pitched, diastolic heart murmur best heard at the second intercostal space and along the left lower sternal border with the patient in full expiration. He has had periodic echocardiograms, and in the most recent one there is evidence of beginning left ventricular dilatation.

What is it? - Chronic aortic insufficiency.

Management: Aortic valve replacement.

CT.8. – A 26 year old drug-addicted man develops congestive heart failure over a short period of a few days. He has a loud, diastolic murmur at the right, second intercostal space. A physical exam done a few weeks ago, when he had attempted to enroll in a detoxification program was completely normal.

What is it? - Acute aortic insufficiency due to endocarditis.

Management: Emergency valve replacement, and antibiotics for a long time.

CT.9. – A 35 year old lady has dyspnea on exertion, orthopnea, paroxysmal nocturnal dyspnea, cough and hemoptysis. She has had these progressive symptoms for about 5 years. She looks thin and cachectic, has atrial fibrillation and a low-pitched, rumbling diastolic apical heart murmur. At age 15 she had rheumatic fever.

What is it? - Mitral stenosis.

Management: Start with echocardiogram. Eventually surgical mitral valve repair.

CT.10. – A 55 year old lady has been known for years to have mitral valve prolapse. She now has developed exertional dyspnea, orthopnea and atrial fibrillation. She has an apical, high pitched, holosystolic heart murmur that radiates to the axilla and back.

What is it? - Mitral regurgitation.

Management: Start with the echocardiogram, eventually surgical repair of the valve (annuloplasty), or possibly valve replacement.

CT.11. – A 55 year old man has progressive, unstable, disabling angina that does not respond to medical management. His father and two older brothers died of heart attacks before the age of 50. The patient stopped smoking 20 years ago, but still has a sedentary life style, is a bit overweight, has type two diabetes mellitus and has high cholesterol.

What is it? - It's a heart attack waiting to happen...but the point of this vignette is the management: this man needs a cardiac catheterization to see if he is suitable candidate for coronary revascularization.

CT.12. – A 55 year old man has progressive, unstable, disabling angina that does not respond to medical management. His father and two older brother died of heart attacks before the age of 50. The patient stopped smoking 20 years ago, but still has a sedentary life style, is a bit overweight, has type two diabetes mellitus and has high cholesterol. Cardiac catheterization demonstrates 70% occlusion of three coronary arteries, with good distal vessels. His left ventricular ejection fraction is 65%.

Management: He is lucky. He has good distal vessels (smokers and diabetics often do not) and enough cardiac function left. He clearly needs coronary bypass, and with 3 vessel disease there should be no argument for angioplasty instead of surgery.

C. Lung

CT.13. – On a routine pre-employment physical examination, a chest X-Ray is done on a 45 year old chronic smoker. A “coin lesion” is found in the upper lobe of the right lung.

What is it? - The concern of course, is cancer of the lung. Next best thing to do: Find an older chest X-Ray if one is available (from one or more years ago). The work up for cancer of the lung is expensive and invasive. On the other hand, cancer of the lung grows and kills in a predictable way, over a matter of several months. If an older X-Ray has the same unchanged lesion, it is not likely cancer. No further work up is needed now, but the lesion should be followed with periodic X-Rays.

CT.14. – A 54 year old man with a 40 pack/year history of smoking gets a chest X-Ray because of persistent cough. A peripheral, 2 cm. “coin lesion” is found in the right lung. A chest X-Ray taken two years ago had been normal. CT scan shows no calcifications in the mass and no enlarged peribronchial or peritracheal lymph nodes. Bronchoscopy and percutaneous needle biopsy have not been able to establish a diagnosis. The man has good pulmonary function and is otherwise in good health.

What to do? - In dealing with cancer of the lung, there is an interplay of three issues: establishing the diagnosis – which sometimes requires very invasive steps; ascertaining if surgery can be done – i.e.: will the patient still be functional after some lung tissue is removed?; and third, does the surgery have a fair chance to cure him? Here is an example of a man who could stand lung resection (peripheral lesion, good function) and who stands a good chance for cure (no node mets). Diagnosis steps should be pushed to the limit. Start with bronchoscopy and washings, if unrewarding go to percutaneous needle biopsy, and if still unsuccessful go to open biopsy, i.e.: thoracotomy and wedge resection.

CT.15. – A 72 year old chronic smoker with severe COPD is found to have a central, hilar mass on chest X-Ray. Bronchoscopy and biopsy establish a diagnosis of squamous cell carcinoma of the lung. His FEV1 is 1100, and a ventilation/perfusion scan shows that 60% of his pulmonary functions comes from the affected lung.

Management: It takes an FEV1 of at least 800 to survive surgery and not be a pulmonary cripple afterwards. If this fellow got a pneumonectomy (which he would need for a central tumor) he would be left with an FEV1 of 440. No way. Don't do any more tests. He is not a surgical candidate. You already have a diagnosis to pursue chemotherapy and radiation.

CT.16. – A 62 year old chronic smoker has an episode of hemoptysis. Chest X-ray shows a central hilar mass. Bronchoscopy and biopsy establish a diagnosis of squamous cell carcinoma of the lung. His FEV1

is 2200, and a ventilation/perfusion scan shows that 30% of his pulmonary function comes from the affected lung.

Management: This fellow could tolerate a pneumonectomy. CT scan and mediastinoscopy are in order, to ascertain if surgery has a decent chance to cure him.

CT.17. – A 33 year old lady is undergoing a diagnostic work-up because she appears to have Cushing's syndrome. Chest X-Ray shows a central, 3 cm. round mass on the right lung. Bronchoscopy and biopsy confirm a diagnosis of small cell carcinoma of the lung.

Management: Radiation and chemotherapy. Small cell lung cancer is not treated with surgery, and thus we have no need to determine FEV1 or nodal status.

11. VASCULAR

CT.18. – A 54 year old right handed laborer notices coldness and tingling in his left hand as well as pain in the forearm when he does strenuous work. What really concerned him, though, is that in the last few episodes he also experienced transitory vertigo, blurred vision and difficulty articulating his speech. Angiogram demonstrates retrograde flow through the vertebral artery.

What is it? – Subclavian steal syndrome. A combination of “claudication of the arm” with posterior brain neurological symptoms is classical for this rare, but fascinating (and thus favorite question condition.

Management: If you had been given the vignette without the angiographic study, you would have asked for it. Now that you have it, you are ready for vascular surgery.

CT.19. – A 62 year old man is found on physical exam to have a 6 cm. pulsatile mass deep in the abdomen, between the xiphoid and the umbilicus.

What is it? – Abdominal aortic aneurysm.

Management: Needs elective surgical repair.

CT.20. – A 62 year old man has vague, poorly described epigastric and upper back discomfort. He has been found on physical exam to have a 6 cm. pulsatile mass deep in the abdomen, between the xiphoid and the umbilicus. The mass is tender to palpation.

What is it? - An abdominal aortic aneurysm that is beginning to leak.

Management: Get a consultation with the vascular surgeons today.

CT.21. – A 68 year old man is brought to the ER with excruciating back pain that began suddenly 45 minutes ago. He is diaphoretic and has a systolic blood pressure of 90. There is an 8 cm., pulsatile mass palpable deep in his abdomen, between the xiphoid and the umbilicus.

What is it? - Abdominal aortic aneurysm, rupturing right now.

What does he need? - Emergency surgery.

CT.22. A retired businessman has claudication when walking more than 15 blocks.

Management: Vascular surgery, or angioplasty and stenting are palliative procedures. They do not cure arteriosclerotic occlusive disease. Claudication has an unpredictable course, thus there is no advantage to an “early operation”. This man needs nothing. If he smokes, he should quit.

CT.23. – A 56 year old postman describes severe pain in his right calf when he walks two or three blocks. The pain is relieved by resting 10 or 15 minutes, but recurs if he walks again the same distance. He can not do his job this way, and he does not qualify yet for retirement, so he is most anxious to have this problem resolved. He does not smoke.

Management: This fellow needs help. Start with Doppler studies. If he has significant gradient, arteriogram comes next, followed by bypass surgery or stenting.

CT.24. – A patient consults you because he “can not sleep”. On questioning it turns out that he has pain in the right calf, which keeps him from falling asleep. He relates that the pain goes away if he sits by the side of the bed and dangles the leg. His wife adds that she has watched him do that, and she has noticed that the leg which was very pale when he was lying down becomes deep purple several minutes after he is sitting up. On physical exam the skin of that leg is shiny, there is no hair and there are no palpable peripheral pulses.

What is it? - Another version of the same problem. In this case rest pain. Definitely he needs the studies to see if vascular surgery could help him.

CT.25. – A 45 year old man shows up in the ER with a pale, cold, pulseless, paresthetic, painful and paralytic lower extremity. The process began suddenly two hours ago. Physical exam shows no pulses anywhere in that lower extremity. Pulse at the wrist is 95 per minute, grossly irregular.

What is it? - Embolization by the broken-off tail of a clot from the left atrium.

What does he need? - Emergency surgery with use of Fogarty catheters to retrieve the clot.

CT.26. – A 74 year old man has sudden onset of extremely severe, tearing chest pain that radiates to the back and migrates down shortly after it's onset. His blood pressure is 220/100, he has unequal pulses in the upper extremities and he has a wide mediastinum on chest X-Ray. Electrocardiogram and cardiac enzymes show that he does not have a myocardial infarction.

What is it? - Dissecting aneurysm of the thoracic aorta.

Management: Arteriogram first, but the forces that dissected the vessel plus the force of the dye injection could further shear the aorta, thus study is done with beta blockers or IV nitrates to lower blood pressure. If the aneurysm is in the ascending aorta, emergency surgery will be done. If it is in the descending, intensive therapy (in the ICU) for the hypertension will be the preferable option.

12. NEUROSURGERY

A. Vascular - Occlusive

NS.1. – A 62 year old right handed man has transient episodes of weakness in the right hand, blurred vision, and difficulty expressing himself. There is not associated headache, the episodes last about 5 or 10 minutes at the most, and they resolve spontaneously. Funduscopic examination reveals highly refractile crystals in the left retinal artery.

What is it? – Transient ischemic attacks in the territory of the left carotid artery (probably an ulcerated plaque at the left carotid bifurcation).

How is the diagnosis confirmed? - In spite of a constant search for a non-invasive alternative, the gold standard is still angiogram.

Treatment: Carotid endarterectomy.

NS.2. – A 61 year old man presents with a one year history of episodes of vertigo, diplopia, blurred vision, dysarthria and instability of gait. The episodes last several minutes, have no associated headache and leave not neurological sequela.

What is it? - Another version of transient ischemic attacks, but now the vertebrals may be involved.

Management: choose an arteriogram that examines all the arteries going to the brain: i.e. an aortic arch study. Vascular surgery will follow.

NS.3. – A 60 year old diabetic male presents with abrupt onset of right third nerve paralysis and contralateral hemiparesis. There was no associated headache. The patient is alert, but has the neurological deficits mentioned.

What is it? – Neurological catastrophes that begin suddenly and have no associated headache are vascular occlusive. The vernacular for this man's problem is "a stroke".

Management: Vascular surgery in the neck is designed to prevent strokes, not to treat them once they happen. This fellow will get a CT scan to assess the extent of the infarct, and supportive treatment with eventual emphasis on rehabilitation.

B. Vascular - Hemorrhagic

NS.4. – A 64 year old black man complains of a very severe headache of sudden onset and then lapses into a coma. Past medical history reveals untreated hypertension and examination reveals a stuporous man with profound weakness in the left extremities.

What is it? - Neurological catastrophes of sudden onset, with severe headache are vascular hemorrhagic. This man has bled into his head. In the vernacular, he has also suffered "a stroke".

Management: Again supportive with eventual rehabilitation efforts if he survives. CT scan is the universal first choice to see blood inside the head (we use it in trauma for the same purpose). This man will get one, to see exactly where he bled, and how bad it is.

NS.5. – A 39 year old lady presents to the ER with a history of a severe headache of sudden onset that she says is different and worse than any headache she has ever had before. She is given pain medication and sent home. She improves over the next few days, but ten days after the initial visit she again gets a sudden, severe and singular diffuse headache and she returns to the ER. This time she has some nuchal rigidity on physical exam.

What is it? - This one is a classic: subarachnoid bleeding from an intracranial aneurysm. The “sentinel bleed” that is not identified for what it is, is a common feature. The “sudden, severe and singular” nature of the pain, are classics. And the nuchal rigidity betrays the presence of blood in the subarachnoid space.

Diagnosis: We are looking for blood inside the head, thus start with CT. Angiograms will eventually follow, in preparation for surgery to clip the aneurysm.

C. Tumors

NS.6. – A 31 year old nursing student developed persistent headaches that began approximately 4 months ago, have been gradually increasing in intensity and are worse in the mornings. For the past three weeks, she has been having projectile vomiting. Thinking that she may need new glasses, she seeks help from her optometrist, who discovers that she has bilateral papilledema.

What is it? - Brain tumor. Neurological processes that develop over a period of a few months and lead to increased intracranial pressure, spell out tumor. Morning headaches are typical. If the tumor is in a “silent” area of the brain, there may be no other neurological deficits.

Management: If given the option, pick MRI as your diagnostic test. If not offered, settle for CT scan. Measures to decrease intracranial pressure while awaiting surgery, include mannitol, hyperventilation, and high dose steroids (decadron).

NS.7. – A 42 year old right handed man has a history of progressive speech difficulties and right hemiparesis for five months. He has had progressively severe headaches for the last two months. At the time of admission he is confused, vomiting, has blurred vision, papilledema and diplopia. Shortly thereafter his blood pressure goes up to 190 over 110, and he develops bradychardia.

What is it? - Again brain tumor, but now with two added features: there are localizing signs (left hemisphere, parietal and temporal area) and he manifests the Cushing’s reflux of extremely high intracranial pressure.

Management: is as above, but as an emergency.

NS.8. – A 12 year old boy is short for his age, has bitemporal hemianopsia and has a calcified lesion above the sella in X-Rays of the head.

What is it? – Craniopharyngioma.

Management: Get the fancy MRI and proceed with pituitary surgery.

NS.9. – A 23 year old nun presents with a history of amenorrhea and galactorrhea of six months duration. She is very concerned that other may think that she is pregnant, and she vehemently denies such a possibility.

What is it? - Prolactinoma.

Management: Every time you suspect a functioning tumor of an endocrine gland, you measure the appropriate hormone. So, here you want a prolactin level. You are also going to do surgery eventually, so you need to see the tumor. The top choice for that is MRI. The surgery will be trans-nasal, trans-sphenoidal. If inoperable, Bromocriptine will help.

NS.10. – A 44 year old man is referred for treatment of hypertension. His physical appearance is impressive: he has big, fat, sweaty hands; large jaw and thick lips, large tongue and huge feet. He is also found to have a touch of diabetes. In further questioning he admits to headaches and he produces pictures of himself taken several years ago, where he looks strikingly different.

What is it? - Acromegaly. Appearance is so striking that the vignette is likely to come with a picture.

Management: Growth hormone determination, MRI and eventually pituitary surgery.

NS.11. – A 15 year old girl has gained weight and become “ugly”. She shows a picture of herself a year ago, where she was a lovely young lady. Now she has a hairy, red, round face full of pimples; her neck has a posterior hump and her supraclavicular areas are round and convex. She has a fat trunk and thin extremities. She has mild diabetes and hypertension.

What is it? - Cushing’s. this one will also come with a picture, rather than a description.

Management: AM and PM cortisol levels, dexamethasone suppression test, MRI of the sella and eventually trans-sphenoidal pituitary surgery.

NS.12. – A 27 year old lady presents with a six month history of headaches, visual loss and amenorrhea. The day of admission to the hospital she developed a severe headache, marked deterioration of remaining vision and stupor. Besides the stupor, physical exam is remarkable because her blood pressure is 75/45. Funduscopic examination reveals bilateral pallor of the optic nerves.

NS.13. – A 55 year old lady is involved in a minor traffic accident where her car was hit sideways by another car that she “did not see” at an intersection. When she is tested further it is recognized that she has bitemporal hemianopsia. Ten years ago she had bilateral adrenalectomies for Cushing’s disease.

What is it? - Nelson’s syndrome. Years ago, before imaging studies could identify pituitary microadenomas, patients with Cushing’s were treated with bilateral adrenalectomy instead of pituitary surgery. In some of those patients the pituitary microadenoma kept on growing and eventually gave pressure symptoms. That is Nelson’s syndrome.

Management: MRI will show the tumor. Trans-nasal, trans-sphenoidal surgery will remove it.

NS.14. – A 42 year old man has been fired from his job because of inappropriate behavior. For the past two months he has gradually developed very severe, “explosive” headaches that are located on the right side, above the eye. Neurologic exam shows optic nerve atrophy on the right, papilledema on the left and anosmia.

What is it? - Brain tumor in the right frontal lobe. A little knowledge of neuroanatomy can help localize tumors. The frontal lobe has to do with behavior and social graces, and is near the optic nerve and the olfactory nerve. If you want the fancy name, this is the Foster-Kennedy syndrome.

Management: MRI and neurosurgery.

NS.15. – A 32 year old man complains of progressive, severe generalized headaches, that began three months ago, are worse in the mornings and lately have been accompanied by projectile vomiting. He has lost his upper gaze and he exhibits the physical finding known as “sunset eyes”.

What is it? - Another classic. This tumor is in the pineal gland and if you want the fancy name it is Parinaud’s syndrome.

What do you do?: MRI to start. The neurosurgeons will take care of the rest.

NS.16. – A six year old boy has been stumbling around the house and complaining of severe morning headaches for the past several months. While waiting in the office to be seen, he assumes the knee-chest position as he holds his head. Neurological exam demonstrates truncal ataxia.

What is it? - Tumor of the posterior fossa. Most brain tumors in children are located there, and cerebellar function is affected.

Management: MRI, neurosurgery.

NS.17. – A 23 year old man develops severe headache, seizures and projectile vomiting over a period of two weeks. He has low grade fever, and was recently treated for acute otitis media and mastoiditis.

What is it? - Brain abscess. Signs and symptoms suggestive of brain tumor that develop in a couple of weeks with fever and an obvious source on infection, spell out abscess.

Management: These are seen in CT as well as they would on MRI, and the CT is cheaper and easier to get...so pick CT if offered. Then the abscess has to be resected by the neurosurgeons.

D. Spinal Cord

NS.18. – An 18 year old street fighter gets stabbed in the back, just to the right of the midline. He has paralysis and loss of proprioception distal to the injury on the right side, and loss of pain perception distal to the injury on the left side.

What is it? - Probably no one in real life will have such a neat clear-cut syndrome, but for purposes of examination vignettes this is a classical spinal cord hemisection, better known as Brown-Sequard’s.

NS.19. – A patient involved in a car accident sustains a burst fracture of the vertebral bodies. He develops loss of motor function and loss of pain and temperature sensation on both sides distal to the injury, while showing preservation of vibratory sense and position sense.

What is it? - Anterior cord syndrome.

NS.20. – An elderly man is involved in a rear end automobile collision where he hyperextends his neck. He develops paralysis and burning pain of both upper extremities while maintaining good motor function in his legs.

What is it? - Central cord syndrome.

Management for all three: I doubt that the long and complicated management of spinal cord injuries will be tested on the exam, but one item might show up: there is some suggestion that high dose corticosteroids soon after a spinal cord injury may help minimize the permanent damage. The medical evidence is weak, but the legal consequences of not doing it could be devastating, thus it has become an imperative to do it. Pick that answer, if offered for the acute management.

NS.21. – A 52 year old lady has constant, severe back pain for two weeks. While working on her yard, she suddenly falls and can not get up again. When brought to the hospital she is paralyzed below the waist. Two years ago she had a mastectomy for cancer of the breast,

What is it? - Most tumors affecting the spinal cord are metastatic, extradural. In this case the source is obvious, and the sudden onset of the paralysis suggests a fracture with cord compression or transection.

Management: MRI is the best imaging modality for the spinal cord. The neurosurgeons may be able to help if the cord is compressed rather than transected.

NS.22. – A 45 year old male gives a history of aching back pain for several months. He has been told that he had muscle spasms, and was given analgesics and muscle relaxants. He comes in now because of the sudden onset of very severe back pain that came on when he tried to lift a heavy object. The pain is “like an electrical shock that shoots down his leg”, and it prevents him from ambulating. He keeps the affected leg flexed. Straight leg raising test gives excruciating pain..

What is it? - Lumbar disk herniation. The peak age incidence is 45, and virtually all of these are either L4-L5 or L5-S1.

Management: MRI for diagnosis. Bed rest will take care of most of these. Neurosurgical intervention only if there is progressive weakness or sphincteric deficits.

NS.23. – A 79 year old man complains of leg pain brought about by walking and relieved by rest. On further questioning it is ascertained that he has to sit down or bend over for the pain to go away. Standing at rest will not do it. Furthermore, he can exercise for long periods of time if he is “hunched over”, such as riding a bike or pushing a shopping cart. He has normal pulses in his legs.

What is it? - Neurogenic claudication.

Management: Get MRI. Eventually surgical decompression of this cauda equina.

E. Pain Syndromes

NS.24. – A 60 year old man complains of extremely severe, sharp, shooting, “like a bolt of lightning”, pain in his face which is brought about by touching a specific area, and which lasts about 60 seconds. His neurological exam is normal, but it is noted that part of his face is unshaven, because he fears to touch that area.

What is it? - Tic doloureux (trigeminal neuralgia).

Management: Rule out organic lesions with MRI. Treat with anticonvulsants.

NS.25. – Several months after sustaining a crushing injury of his arm, a patient complains bitterly about constant, burning, agonizing pain that does not respond to the usual analgesic medications. The pain is aggravated by the slightest stimulation of the area. The arm is cold, cyanotic and moist.

What is it? - Causalgia (reflex sympathetic dystrophy)

Management: A successful sympathetic block is diagnostic, and surgical sympathectomy will be curative.

13. ORTHOPEDICS

A. Children

OR.1. – In the newborn nursery it is noted that a child has uneven gluteal folds. Physical exam of the hips reveals that one of them can be easily dislocated posteriorly with a jerk and a “click”, and returned to normal position with a “snapping”.

What is it? – Developmental dysplasia of the hip

Management: Abduction splinting. (Don’t order X-Rays in a newborn. Calcification is still incomplete and you will not see anything).

OR.2. – A 6 year old boy has insidious development of limping with decreased hip motion. He complains occasionally of knee pain on that side. He walks into the office with an antalgic gait. Passive motion of the hip is guarded.

What is it? - In this age group, Legg-Perthes disease (avascular necrosis of the capital femoral epiphysis). Remember that hip pathology can show up with knee pain.

Management: AP and lateral X-Rays for diagnosis. Contain the femoral head within the acetabulum by casting and crutches.

OR.3. – A 13 year old boy complains of pain in the groin (it could be the knee) and is noted by the family to be limping. He sits in the office with the foot on the affected side rotated towards the other foot. Physical examination is normal for the knee, but shows limited hip motion. As the hip is flexed, the leg goes into external rotation and it can not be rotated internally.

What is it? - Forget the details: a bad hip in this age group is slipped capital femoral epiphysis, an orthopedic emergency.

Management: AP and lateral X-Rays for diagnosis. The orthopedic surgeons will pin the femoral head in place.

OR.4. – A little toddler has had the flu for several days, but he was walking around fine until about two days ago. He now absolutely refuses to move one of his legs. He is in pain, holds the leg with the hip flexed, in slight abduction and external rotation and you can not examine that hip he will not let you move it. He has elevated sedimentation rate.

What is it? - Another orthopedic emergency: septic hip.

Management: Under general anesthesia the hip is aspirated to confirm the diagnosis, and open arthrotomy is done for drainage.

OR.5. – A child with a febrile illness but no history of trauma has persistent, severe localized pain in a bone.

What is it? - Acute hematogenous osteomyelitis

Management: don't fall for the X-Ray option. X-Ray will not show anything for two weeks. Do bone scan.

OR.6. – A 12 year old girl is referred by the school nurse because of potential scoliosis. The thoracic spine is curved toward the right, and when the girl bends forward a “hump” is noted over her right thorax. The patient has not yet started to menstruate.

Management: Too complicated for our purposes, but the point is that scoliosis may progress until skeletal maturity is reached. Baseline X-Rays are needed to monitor progression. At the onset of menses skeletal maturity is about 80%, so this patient still has a way to go. Bracing may be needed to arrest progression. Pulmonary function could be limited if there is large deformity.

B. Tumors

OR.7. – A 16 year old boy complains of low grade but constant pain in his distal femur present for several months. He has local tenderness in the area, but is otherwise asymptomatic. X-Rays show a large bone tumor, with “sunburst” pattern and periosteal “onion skinning”.

What is it? - Malignant bone tumor. Either osteogenic sarcoma or Ewing's sarcoma.

Management: The point of the vignette is that you do not mess with these. Do not attempt biopsy. Referral is needed, not just to an orthopedic surgeon (they see one of these every three years), but to a specialist on bone tumors.

OR.8. – A 66 year old lady picks up a bag of groceries and her arm snaps broken.

What is it? - A pathologic fracture (i.e: for trivial reasons) means bone tumor, which in the vast majority of cases will be metastatic. Get X-Rays to diagnose this particular broken bone, whole body bone scans to identify other mets, and start looking for the primary. In women, breast. In men, prostate. In heavy smokers, lung...and so on.

OR.9. – A 58 year old lady has a soft tissue tumor in her thigh. It has been growing steadily for six months, it is located deep into the thigh, is firm, fixed to surrounding structures and measures about 8 cm. in diameter.

What is it? - Soft tissue sarcoma is the concern.

Diagnosis: start with MRI. Leave biopsy and further management to the experts.

C. General Orthopedics

OR.10. – A middle aged homeless man is brought to the ER because of very severe pain in his forearm. The history is that he passes out after drinking a bottle of cheap wine and he slept on a park bench for an indeterminate time, probably more than 12 hours. There are no signs of trauma, but the muscles in his forearm are very firm and tender to palpation, and passive motion of his fingers and wrist elicit excruciating pain. Pulses at the wrist are normal.

What is it? - Compartment syndrome.

Management; Emergency fasciotomy.

OR.11. – A patient presents to the ER complaining of moderate but persistent pain in his leg under a long leg plaster cast that was applied six hours earlier for an ankle fracture.

The point of this vignette is that you never give pain medication and do nothing else for pain under a cast. The cast has to come off right away. It may be too tight, it may be compromising blood supply, it may have rubbed off a piece of skin...whatever. Your only acceptable option here is to remove the cast.

OR.12. – A young man involved in a motorcycle accident has an obvious open fracture of his right thigh. The femur is sticking out through a jagged skin laceration.

The point of this one is that open fractures are orthopedic emergencies. This fellow may need to have other problems treated first (abdominal bleeding, intracranial hematomas, chest tubes, etc), but the open fracture should be in the OR getting cleaned and reduced within six hours of the injury.

OR.13. – A 55 year old lady falls in the shower and hurts her right shoulder. She shows up in the ER with her arm held close to her body, but rotated outwards as if she were going to shake hands. She is in pain and will not move the arm from that position. There is numbness in a small area of her shoulder, over the deltoid muscle.

What is it? - Anterior dislocation of the shoulder, with axillary nerve damage.

Management: Get AP and lateral X-Rays for diagnosis. Reduce.

OR.14. – After a grand mal seizure, a 32 year old epileptic notices pain in her right shoulder and she can not move it. She goes to the near-by “Doc in a Box”, where she has X-Rays and is diagnosed as having a sprain and given pain medication. The next day she still has the same pain and inability to move the arm. She comes to the ER with the arm held close to her body, in a “normal” (i.e., not externally rotated, but internally rotated) position.

What is it? - Posterior dislocation of the shoulder. Very easy to miss on regular X-Rays.

Management: Get X-Rays again but order axillary view or scapular lateral.

OR.15. – A front seat passenger in a car that had a head-on collision relates that he hit the dashboard with his knees, and complains of pain in the right hip. He lies in the stretcher in the ER with the right extremity shortened, adducted, and internally rotated.

What is it? - Another orthopedic emergency: posterior dislocation of the hip. The blood supply of the femoral head is tenuous, and delay in reduction could lead to avascular necrosis.

Management: X-Rays and emergency reduction.

OR.16. – A 77 year old man falls in the nursing home and hurts his hip. X-Rays show that he has a displaced femoral neck fracture.

The point of this vignette is that blood supply to the femoral head is compromised in this setting and the patient is better off with a metal prosthesis put in, rather than an attempt at fixing the bone. With intertrochanteric fractures on the other hand, the broken bones can be pinned together and expected to heal.

OR.17. A football player is hit straight on his right leg and he suffers a posterior dislocation of his knee.

The point here is that posterior dislocation of the knee can nail the popliteal artery.

Attention to integrity of pulses, arteriogram and prompt reduction are the key issues.

OR.18. – A young recruit complains of localized pain in his tibia after a forced march at boot camp. He is tender to palpation over a very specific point on the bone, but X-Rays are normal.

What is it? - Stress fracture.

The lesson here is that stress fractures will not show up radiologically until 2 weeks later. Treat the guy as if he had a fracture (cast) and repeat the X-Ray in 2 weeks.

OR.19. – A man who fell from a second floor window has clinical evidence of fracture of his femur. The vignette gives you a choice of X-Rays to order.

Here are the rules: Always get X-Rays at 90° to each other (for instance, AP and lateral), always include the joints above and below, and if appropriate (this case is) check the other bones that might be in the same line of force (here the lumbar spine).

OR.20. – A healthy 24 year old man steps on a rusty nail at the stables where he works as a horse breeder. Three days later he is brought to the ER moribund, with a swollen, dusky foot, in which one can feel gas crepitation.

What is it? - Gas gangrene.

What to do? - Tons of IV penicillin and immediate surgical debridement of dead tissue, followed by a trip to the nearest hyperbaric chamber for hyperbaric O₂ treatment.

OR.21. – A 55 year old, obese man suddenly develops swelling, redness and exquisite pain at the first metatarsal-phalangeal joint.

What is it? - Gout.

Management: Diagnosis by serum uric acid determination and identification of uric acid crystals in fluid from the joint. Rx. with colchicine, allopurinol or probenecid.

OR.22. – A 67 year old diabetic has an indolent, unhealing ulcer at the heel of the foot.

What is it? - Ulcer at a pressure point in a diabetic is due to neuropathy, but once it has happened it is unlikely to heal because the microcirculation is poor also.

Management: control the diabetes, keep the ulcer clean, keep the leg elevated..and be resigned to the thought that you may end up amputating the foot.

OR.23. – A 67 year old smoker with high cholesterol and coronary disease has an indolent, unhealing ulcer at the tip of his toe. The toe is blue, and he has no peripheral pulses in that extremity.

What is it? - Ischemic ulcers are at the farthest away point from where the blood comes.

Management: Doppler studies looking for pressure gradient, arteriogram. Revascularization may be possible, and then the ulcer may heal.

OR.24. – A 44 year old, obese woman has an indolent, unhealing ulcer above her right malleolus. The skin around it is thick and hyperpigmented. She has frequent episodes of cellulitis, and has varicose veins.

What is it? – Venous stasis ulcer.

Management: Unna boot. Support stocking. Varicose vein surgery.

14. UROLOGY

A. Urological Emergencies

GU.1. – A 14 year old boy presents in the Emergency Room with very severe pain of sudden onset in his right testicle. There is no fever, pyuria or history of recent mumps. The testis is swollen, exquisitely painful, “high riding”, and with a “horizontal lie”. The cord is not tender.

What is it? - Testicular torsion, a urological emergency.

Management: Emergency surgery to save the testicle.

GU.2. – A 24 year old man presents in the emergency room with very severe pain of recent onset in his right scrotal contents. There is fever of 103 ° and pyuria. The testis is in the normal position, and it appears to be swollen and exquisitely painful. The cord is also very tender.

What is it? - Acute epididimitis.

Management: This is the condition that presents the differential diagnosis with testicular torsion. Torsion is a surgical emergency. Epididimitis is not. Don't rush this guy to the OR, all he needs is antibiotic therapy. If the vignette is not clear-cut, i.e: and adolescent that looks like epididimitis, but could be torsion, pick a sonogram to rule out torsion before you choose the non-surgical option.

GU.3. – A 72 year old man is being observed with a ureteral stone that is expected to pass spontaneously. He develops chills, a temperature spike to 104 and flank pain.

What is it? - Obstruction of the urinary tract alone is bad. Infection of the urinary tract alone is bad. But the combination of the two is horrible: a true urological emergency. That's what this fellow has.

Management: Massive intravenous antibiotic therapy, but the obstruction must also be relieved right now. In a septic patient stone extraction would be hazardous, thus the option in addition to antibiotics would be decompression by ureteral stent or percutaneous nephrostomy.

GU.4. – An adult female relates that five days ago she began to notice frequent, painful urination, with small volumes of cloudy and malodorous urine. For the first three days she had no fever, but for the past two days she has been having chills, high fever, nausea and vomiting. Also in the past two days she has had pain in the right flank. She has had no treatment whatsoever up to this time.

What is it? - Pyelonephritis.

Management: Urinary tract infections should not happen in men or in children, and thus they should trigger a work-up looking for a cause. Women of reproductive age on the other hand, get cystitis all the time and they are treated with appropriate antibiotics without great fuss. However, when they get flank pain and septic signs it's another story. This lady needs hospitalization, IV antibiotics and at least a sonogram to make sure that there is no concomitant obstruction.

GU.5. – A 62 year old male presents with chills, fever, dysuria, urinary frequency, diffuse low back pain and an exquisitely tender prostate on rectal exam.

What is it? - Acute bacterial prostatitis.

Management: This vignette is supposed to elicit from you what you would not do. The treatment for this man is intuitive: he needs I.V. antibiotics...but what should not be done is any more rectal exams or any vigorous prostatic massage. Doing so could lead to septic shock.

GU.6. – You receive a call from a patient at 3:00 AM. His regular urologist retired five years ago, and he has not sought a replacement. At about 11:00 PM last night, the patient injected himself with papaverine directly into the corpora, as he had been instructed to do for his chronic, organic impotence. He achieved a satisfactory erection and had intercourse, but the erection has not gone away and he still has it at this time.

What is it? – Priapism is another urological emergency. In the old days it was very rarely seen, but now the iatrogenic form is common.

Management: Continued erection beyond four hours begins to damage the corpora. He needs emergency injection of an alpha agonist (phenylephrine, epinephrine or terbutaline) into the corpora. Once the crisis is over, the patient has to be switched from papaverine to Prostaglandin E1, which is now the agent of choice to achieve erection because it is less likely to produce priapism.

B. Congenital

GU.7. – You are called to the nursery to see an otherwise healthy looking newborn boy because he has not urinated in the first 24 hours of life. Physical exam shows a big distended urinary bladder.

What is it? - Kids are not born alive if they have not kidneys (without kidneys, lungs do not develop). This represents some kind of obstruction. First look at the meatus, it could be simple meatal stenosis. If it is not, posterior urethral valves is the best bet.

Management: Drain the bladder with a catheter (it will pass through the valves). Voiding cystourethrogram for diagnosis, endoscopic fulguration or resection for treatment.

GU.8. – A bunch of newborn boys are lined up in the nursery for you to do circumcisions.

You notice that one of them has the urethral opening in the ventral side of his penis, about mid-way down the shaft.

What is it? - Hypospadias.

The point of the vignette is that you don't do the circumcision. The foreskin may be needed later for reconstruction when the hypospadias is surgically corrected.

GU.9. – A 7 year old child falls off a jungle gym and has minor abrasions and contusions. When checked by his pediatrician, a urinalysis shows microhematuria.

What is it? - Hematuria from the trivial trauma in kids means congenital anomaly of some sort.

Management: start with sonogram. IVP may be needed later.

GU.10. – A 9 year old boy gives a history of three days of burning on urination, with frequency, low abdominal and perineal pain, left flank pain and fever and chills for the past two days.

What is it? - Little boys are not supposed to get urinary tract infections. There is more than meets the eye here. A congenital anomaly has to be ruled out.

Management: treat the infection of course, but also do sonogram right away to begin the work up.

GU.11. – A mother brings her 6-year-old girl to you because “ she has failed miserably to get proper toilet training”. On questioning you find out that the little girl perceives normally the sensation of having to void, voids normally and at appropriate intervals, but also happens to be wet with urine all the time.

What is it? - A classic vignette: low implantation of one ureter. In little boys there would be no symptoms, because low implantation in boys is still above the sphincter, but in little girls the low ureter empties into the vagina and has no sphincter. The other ureter is normally implanted and accounts for her normal voiding pattern.

Management: If the vignette did not include physical exam, that would be the next step, which might show the abnormal ureteral opening. Often physical exam does not reveal the anomaly, and imaging studies would be required (start with IVP). Surgical repair will follow.

GU.12. – A 16 year old boy sneaks out with his older brother’s friends, and goes on a beer-drinking binge for the first time in his life. He shortly thereafter develops colicky flank pain.

What is it? - Another classic. Ureteropelvic junction obstruction.

Management: Start with ultrasound (sonogram). Repair will follow.

C. Tumors

GU.13. – A 62 year old male known to have normal renal function reports an episode of gross, painless hematuria. Further questioning determines that the patient has total hematuria rather than initial or terminal hematuria.

What is it? - The blood is coming anywhere from the kidneys to the bladder, rather than the prostate or the urethra. Either infection or tumor can produce hematuria. In older patients without signs of infection cancer is the main concern, and it could be either renal cell carcinoma or transitional cell cancer of the bladder.

Management: The traditional “gold standard-first study” in urology is IVP (Intravenous pyelogram, also known as excretory urogram). It’s main contraindication is poor renal function. That is your first choice here. If normal, the next step is cystoscopy. Newer imaging studies have displaced the IVP in some settings: sonogram is no the first step when the issue is potential obstruction. CT scan is superb for renal pathology, but is still not the first step in most cases. Some urologists will start the evaluation of hematuria with cystoscopy (if there is no infection), but for the purposes of the exam the best option remains IVP first, and cystoscopy next.

GU.14. – A 70 year old man is referred for evaluation because of a triad hematuria, flank pain and a flank mass. He also has hypercalcemia, erythrocytosis and elevated liver enzymes.

What is it? - An examination vignette, that’s what this is. No one in real life will present with all the signs and symptoms of renal cell carcinoma (also known as clear cell carcinoma, or hypernephroma) which this hypothetical patient has.

Management: IVP first and CT scan next would be the standard sequence. In real life, if a urologist saw a patient with a palpable flank mass, he or she might go straight for the CT scan. Hopefully they will offer you one or the other, and not force you to choose between the two.

GU.15. – A 61 year old man presents with a history of hematuria. Intravenous pyelogram shows a renal mass, and sonogram shows it to be solid rather than cystic. CT scan shows a heterogenic, solid tumor.

What is it? - A better vignette if the objective is to recognize renal cell carcinoma.

GU.16. – A 55 year old, chronic smoker, reports three instances in the past two weeks when he has had painless, gross, total hematuria. In the past two months he has been treated twice for irritative voiding symptoms, but has not been febrile and urinary cultures have been negative.

What is it? - Most likely bladder cancer.

Management: With this very complete presentation some urologist would go for the cystoscopy first, but the standard sequence of IVP first and cystoscopy next is the only correct answer for an exam. An option both IVP and cystoscopy would be OK.

GU.17. – A 59 year old black man has a rock-hard, discrete, 1.5 cm. nodule felt in his prostate during a routine physical examination.

What is it? - Cancer of the prostate.

Management: Trans-rectal needle biopsy. Eventually surgical resection after the extent of the disease has been established.

GU.18. – A 62 year old gentleman had a radical prostatectomy for cancer of the prostate three years ago. He now presents with widespread bony pain. Bone scans show metastasis throughout the entire skeleton, including several that are very large and very impressive.

What to do? - The point of this vignette is that significant, often dramatic palliation can be obtained with orchiectomy, although it will not be long-lasting (one or two years only). An expensive alternative is luteinizing hormone-releasing hormone agonists, and another option is antiandrogens (flutamide).

GU.19. – An 82 year old gentleman who has congestive heart failure and chronic obstructive pulmonary disease is told by his primary care physician that his level of prostatic specific antigen (PSA) is abnormally high. The gentleman has seen ads in the paper for sonographic examinations of the prostate, and he has one done. The examination reveals a prostatic nodule, which on trans-rectal biopsy is proven to be carcinoma of the prostate. The man is completely asymptomatic as far as this cancer is concerned. He has not evidence of metastasis either.

What is it? - An example of technology running amok. This man should have never had the PSA in the first place, much less the sonogram and biopsy. After a certain age, most men get prostatic cancer...but die of something else. As a rule, asymptomatic prostatic cancer is not treated after age 75.

GU.20. – A 25 year old man presents with a painless, hard testicular mass.

What is it? - Testicular cancer.

Management: This will sound horrible, but here is a disease where we shoot to kill first...and ask questions later. The diagnosis is made by performing a radical orchiectomy by the inguinal route. That irreversible, drastic step is justified because testicular tumors are almost never benign. Beware of the option to do a

trans-scrotal biopsy: that is a definitive no-no. further treatment will include lymph node dissection in some cases (too complicated a decision for you to know about) and platinum-based chemotherapy. Serum markers are useful for follow up: alfa-fetoprotein and beta-HCG, and they have to be drawn before the orchiectomy (but they do not determine the need for the diagnostic orchiectomy, that still needs to be done).

GU.21. – A 25 year old man is found on a pre-employment chest X-Ray to have what appears to be a pulmonary metastasis from an unknown primary tumor. Subsequent physical examination discloses a hard testicular mass, and the patient indicates that for the past six months he has been losing weight for no obvious reason.

What is it? - Obviously same as above...but with metastasis. The point of this vignette is that testicular cancer responds so well to chemotherapy, that treatment is undertaken regardless of the extent of the disease when first diagnosed. Manage exactly as the previous case.

D. Retention - Incontinence

GU.22. – A 60 year old man shows up in the ER because he has not been able to void for the past 12 hours. He wants to, but can not. On physical exam his bladder is palpable half way u between the pubis and the umbilicus, and he has a big, boggy prostate gland without nodules. He gives a history that for several years now, he has been getting up four or five times a night to urinate. Because of a cold, two days ago he began taking antihistaminics, using “nasal drops”, and drinking plenty of fluids.

What is it? - Acute urinary retention, with underlying benign prostatic hypertrophy.

Management: Indwelling bladder catheter, to be left in for at least 3 days. Long term therapy includes many options, best are probably long-term alpha-blockers for symptomatic relief, or some form of prostatic resection.

GU.23. – On the second post-operative day after surgery for repair of bilateral inguinal hernias, the patient reports that he “can not hold his urine”. Further questioning reveals that every few minutes he urinates a few cc’s of urine. On physical examination there is a large palpable mass arising from the pelvis and reaching almost to the umbilicus.

What is it? - Acute urinary retention with overflow incontinence.

Management: Indwelling bladder catheter.

GU.24. – A 42 year old lady consults you for urinary incontinence. She is the mother of five children and ever since the birth of the last one, seven years ago, she leaks a small amount of urine whenever she sneezes, laughs, gets out of a chair or lifts any heavy objects. She relates that she can hold her urine all through the night without any leaking whatsoever.

What is it? - Stress incontinence.

Management: Surgical repair of the pelvic floor.

E. Stones

GU.25. – A 72 year old man who in previous years has passed a total of three urinary stones is now again having symptoms of ureteral colic. He has relatively mild pain that began six hours ago, and does not have much in the way of nausea and vomiting. X-Rays show a 3mm. Ureteral stone just proximal to the ureterovesical junction.

Management: Urologists have a bewildering array of options nowadays to treat stones, including laser beams, shock waves, ultrasonic probes, baskets for extraction...etc, but there is still a role for watching and waiting. This man is a good example: small stone, almost at the bladder. Give him time, medication for pain, and plenty of fluids, and h will probably pass it.

GU.26. – A 54 year old lady has a severe ureteral colic. IVP shows a 7mm. Ureteral stone at the ureteropelvic junction.

Management: whereas a 3mm. Stone has a 70% chance of passing, a 7mm. Stone only has a 5% probability of doing so. This one will have to be smashed and retrieved. Best option among answers offered would be shock-wave-lithotripsy).

F. Miscellaneous

GU.27. – A 33 year old man has urgency, frequency, and burning pain with urination. The urine is cloudy and malodorous. He has mild fever. On physical exam the prostate is not warm, boggy or tender.

The first part of this vignette sounds like prostatitis, which would be common and not particularly challenging; but if the prostate is normal on exam the ante is raised: The point of the vignette becomes that men (particularly young ones) are not supposed to get urinary tract infections. This infection needs to be treated, so ask for urinary cultures and start antibiotics...but also start a urological work-up. Do not start with cystoscopy (do not instrument an infected bladder, you could trigger septic shock). Start with either IVP (always a traditional way to begin a urological work-up), or sonogram (which is also a pretty safe thing to do on anybody under any circumstances).

GU.28. – A 72 year old man consults you with a history for that for the past several days he has noticed that bubbles of air come out along with the urine when he urinates. He also gives symptoms suggestive of mild cystitis.

What is it? - Pneumaturia due to a fistula between the bowel and the bladder. Most commonly from sigmoid colon to dome of the bladder, due to diverticulitis. Cancer (also originating in the sigmoid) is the second possibility.

Management: Intuitively you would think that either cystoscopy or sigmoidoscopy would verify the diagnosis, but real life does not work that way: they seldom show anything. Contrast studies (cystogram or barium enema) are also typically unrewarding. The test to get is CT scan. Because ruling out cancer of the sigmoid is important, the sigmoidoscopic exam would be done at some point, but not as the first test. Eventually surgery will be needed.

GU.29. – A 32 year old man has sudden onset of impotence. One month ago he was unexpectedly unable to perform with his wife after an evening of heavy eating and heavier drinking. Ever since then he has not been able to achieve an erection when attempting to have intercourse with his wife, but he still gets nocturnal erections and can masturbate normally.

What is it? - Classical psychogenic impotence; young man, sudden onset, partner-specific. Organic impotence is typically older, of gradual onset and universal.

Management: Curable with psychotherapy if promptly done. (It will become irreversible after two years).