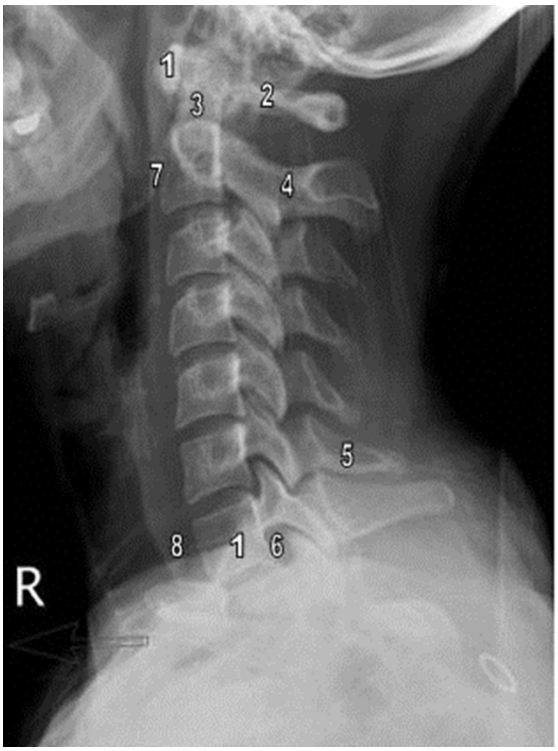
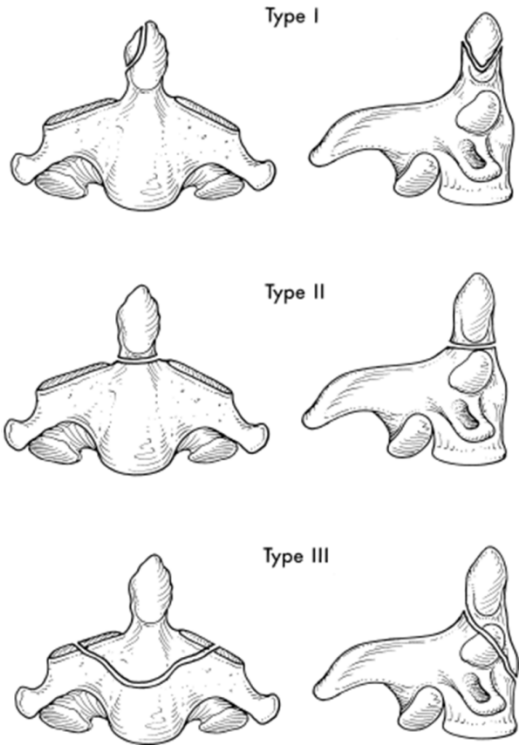
EMERGENCY MEDICINE IMMERSION RAPID REVIEW

1. A 47-year-old man involved in an MVA presents severely hypotensive, tachycardic. His GCS is 13, C-spine, chest X-ray, and pelvic X-rays are all negative. The most likely cause of his hypotension is intraperitoneal hemorrhage or cardiac tamponade.

2. Beck's triad = hypotension, muffled heart sounds, and JVD. It occurs in less than 25% of patients with cardiac tamponade.

3. **In the intubated patient**, loss of the continuous ring may be the **only indication of fracture**, because of difficulty in assessing soft-tissue contours.





4. Unstable fractures of the neck: Jefferson Bit Off A Hangman's Thumb
   - **J**efferson
   - **B**ilateral facet dislocation
   - **O**dontoid fracture II and III
   - **A**ny fracture dislocation
   - **H**angman's fracture
   - **T**ear drop fracture (flexion)

5. The stable fractures – more common than unstable ones (only a few)
   a. Process fractures (spinous and transverse)
   b. Wedge fractures

c. Unilateral facet dislocations
d. Vertebral burst fractures excluding Jefferson's fracture (burst fracture of C1)

6. On X-ray, check the spinolaminar line (Swischuk line) by connecting the anterior portions of the spinous processes of C1 and C3, it is normally within 2 mm of the C2 spinous process. Pediatric pseudosubluxation is usually C2 on C3, sometimes C3 on C4. Predental → 3 mm in adults is pathologic, greater than 5 mm in children is pathologic.

7. A 27-year-old man involved in an MVA has no obvious fractures, head, neck, chest, or pelvic injuries but is hypotensive and tachycardic. The most likely cause for his hypotension is injury to the spleen, as it is the organ injured most commonly, followed by the liver, kidney, small bowel, bladder, colon, diaphragm, pancreas, and retroperitoneal duodenum.

8. What requires immediate descent for a mountain climber at high altitude? (If ataxia is one of the answers, use it.)
    a. Ataxia is an early sign of HACE and HACE is lethal (HAPE is more common, HACE is more lethal).
    b. Other symptoms, including lassitude, headache (even severe, because this is very variable), occur in people at high altitude.

9. Congenital infections causing severe fetal abnormalities

    TORCHES

    TO **To**xoplasmosis
    R **R**ubella
    C **C**MV (most common)
    H **H**erpes simplex/**H**IV/**H**epatitis
    E **E**pstein-Barr
    S **S**yphillis

10. Suicide
    a. The most common mode of completed suicide is firearms. The **presence of firearms** in the home is an **independent risk factor for completed suicide** and patients should be **asked** about the presence of firearms in their home. **Medication** is the most common method of **attempted** suicide. Hanging is the second most common method of completed suicide in men. Women attempt more, men succeed more.

11. Suicide potential

    S **S**ex: male greater than female
    A **A**ge less than 19 or greater than 45 years
    D **D**epression

- **P** **P**revious attempt of psychiatric history
- **E** **E**TOH or drug **E**xcess
- **R** **R**ational thought loss
- **S** **S**eparated/divorced/widowed/single
- **O** **O**rganized attempt
- **N** **N**o social support
- **S** **S**tated future intent

12. Sudden loss of vision
    a. Central retinal artery occlusion
        i. Pale retina, cherry red spot
    b. Central retinal vein occlusion
        i. Squashed tomatoes, blood and thunder
    c. Retinal detachment
        i. Sand dunes, flashes of light, lowering curtain
    d. Temporal arteritis
        i. Polymyalgia rheumatica, 50, ESR, prednisone, blindness, jaw claudication
    e. Multiple sclerosis
        i. Optic neuritis, bilateral internuclear ophthalmoplegia, red desaturation test
    f. Amaurosis fugax
        i. Ocular TIA

13. Ectopic pregnancy
    a. Second leading cause of death in the pregnant woman
    b. 50% missed diagnosis on first office visit
    c. 36% missed diagnosis on first ED visit
    d. Risk factors: IUD, tubal sterilization, PID, previous ectopic pregnancy, infertility treatment, smoker
    e. Unilateral adnexal tenderness present in only 10%
    f. Syncope = rupture (also ↓ BP, tachycardia)
    g. No blood on culdocentesis is **non-diagnostic**
    h. B-hCG should double every 1 - 3 days (first 6 weeks)
    i. B-hCG discriminatory zone for US (1,500 TV, 6,500 TA)
    j. Methotrexate treatment can present one week later with pelvic pain – but could be ectopic progression
    k. Laparoscopy for definitive diagnosis

14. PID
    a. Diagnosis based on major and minor criteria; all major criteria and at least one minor criteria must be present
    b. Major criteria
        i. Abdominal (pelvic) pain

ii. Uterine/adnexal tenderness
iii. Cervical motion tenderness

c. Minor criteria
   i. Temperature greater than 100°F
   ii. Abnormal cervical/vaginal discharge
   iii. Elevated ESR/CRP
   iv. Positive cervical cultures for *N. gonorrhoeae* or *C. trachomatis*, anearobes

d. Risk factors
   i. Young women (15 - 25)
   ii. Multiple sex partners
   iii. Smoking
   iv. Bacterial vaginosis
   v. Peak time within 1st week of menses

e. Treatment
   i. Inpatient
      a) Cefoxitin or cefotetan + doxycycline
   ii. Outpatient
      a) Ceftriaxone 250 mg IM x 1
      b) + Doxy 100 BID for 14 days
      c) +/- Flagyl 500 mg BID x 14 d
      d) **No** quinolones – too much resistance

f. Who gets admitted
   i. Adnexal mass
   ii. Pregnant
   iii. IUD
   iv. Peritonitis
   v. Immunocompromised
   vi. Outpatient failure
   vii. Unable to tolerate oral fluids
   viii. Concerns about future fertility

g. Morbidity
   i. Ectopic pregnancy 6 times more likely in women who have had PID
   ii. Although PID is most common risk factor for PID—Previous ectopic is strongest risk factor
   iii. Infertility 8% with first episode
   iv. Chronic pelvic pain in up to 18% of women after PID had resolved

h. IUDs in patients with PID
   i. Risk of PID associated with IUD is confided to the first 3 weeks after insertion and uncommon thereafter. No evidence that IUD should be removed in women diagnosed with acute PID, but close follow up mandatory

15. Fitz-Hugh-Curtis syndrome
    a. Patient with PID
        i. Occurs in 4 - 14% of patients with PID, more common among adolescents with PID
        ii. Most common cause is Chlamydia, much greater than GC
    b. RUQ pain worse with deep breathing or coughing radiating to right shoulder
    c. Perihepatitis (liver function tests normal or minimally elevated)
    d. "Violin string" adhesions on laparoscopy

16. Posterior humeral dislocation
    a. Light bulb sign = posterior humeral dislocation.
        i. The humeral head takes on a rounded, more symmetrical shape on the AP view, like a light bulb, due to internal rotation of the humerus; the articular surfaces faces posteriorly.
    b. Rim sign
        i. The distance between the glenoid and the articular surface of the humerus increases to more than 6 mm
        ii. This occurs because the humeral head impacts the posterior rim of the glenoid, which holds it away from the glenoid articular surface; the posterior rim is often fractured.
    c. Loss of parallelism
        i. The articular surfaces of the glenoid and humerus normally are parallel, but this relationship can be lost in dislocation.
    d. Posterior humeral dislocation is often a result of epileptic seizures, occurring while the limbs are in extreme internal rotation; unexplained bilateral posterior humeral dislocations with no history of trauma should suggest the onset of epilepsy.
    e. Clinical presentation
        i. Occurs with violent force: seizure, electrocution
        ii. Cannot abduct or externally rotate humerus
        iii. Less likely to have neurovascular injury than anterior dislocation due to anterior position of neurovascular bundle

17. The inconsolable child

    SOA BITCH

    S **S**trangulation (digit, penis)
    O **O**pen diaper pin
    A **A**nal fissure

    B **B**attered
    I **I**nfection (UTI, OM)/**I**ntussusception
    T **T**esticular torsion
    C **C**orneal abrasion

H **H**ernia (incarcerated)

18. Pancreatic injuries
    a. More common in penetrating trauma
    b. Although the pancreatic injury itself in blunt trauma may be subtle, pancreatic injuries usually occur in more severely injured patients.
    c. Serum amylase is elevated in only 27% of penetrating injuries to the pancreas.
    d. Release of pancreatic enzymes more commonly causes mild tenderness on palpitation, rather than peritoneal signs.

19. Associate the bugs with the wound:
    a. Cat bite
        i. *Pasteurella multocida*
    b. Puncture wound through tennis shoe
        i. *Staphylococcus, Streptococcus*
    c. Osteomyelitis from puncture wound through tennis shoe
        i. *Pseudomonas aeruginosa*
    d. Dog bite
        i. *Staphylococcus, Streptococcus* most commonly, alpha hemolytic *Streptococcus, Pasteurella multocida*
    e. Human bite
        i. *Staphylococcus, Streptococcus* most common, *Bacteroides* most common anaerobe, *Eikenella corrodens*
        ii. *Eikenella* (facultative anaerobic gram-negative rod harbored in dental plaque) is found in 25 - 29% of human closed-fist injury infections (penicillin, 2nd or 3rd-generation cephalosporins, tetracycline, fluoroquinolones).
        iii. More than 100,000 different organisms from the oral cavity. *Eikenella corrodens, Streptococcus*, and *Corynebacterium* species
        iv. *Staphylococcus aureus* is associated with some of the most severe infections, resulting in the highest complication rates.
        v. *Eikenella corrodens* is a slow-growing, gram-negative bacillus frequently associated with chronic infection and abscess formation. Commonly isolated anaerobes include *Bacteroides* and *Peptostreptococcus* species.
    f. Rat bite
        i. *Leptospirosis*

20. Delirium
    a. Onset is acute (days to weeks)
    b. It is usually reversible.
    c. Hallucinations
    d. Fluctuating course
    e. Altered LOC, poor attention

f. Fleeting delusions
g. Sleep/wake cycle disturbances
h. History and physical examination = most important diagnostic tools
i. Diagnosis of delirium must consider:
    i. Infection, medications, CVA, seizure, mile dementia, hypoxia, CNS lesions, liver failure
    ii. Commonly associated with medications (benzodiazepines, diphenhydramine, beta blockers)
    iii. More common among elderly and females; age 20 - 40 years, think toxic/withdrawal
j. Mortality = 20 - 30%

21. Dementia
    a. Insidious onset (months to years)
    b. Progressive course
    c. Awake/alert consciousness
    d. Pays attention
    e. Rarely reversible
    f. No hallucinations
    g. No delusions until very late
    h. Affects 50% of patients older than 85 years of age
    i. Alzheimer's accounts for 70% of dementia patients
    j. Treatable causes of dementia
        D **D**rugs
        E **E**lectrolytes
        M **M**etabolic
        E **E**motional
        N **N**utritional/normal pressure hydrocephalus
        T **T**rauma/tumor
        I **I**nflammation (SLE/infection)
        A **A**lcohol
        i. Wernicke-Korsakoff Syndrome: ataxia, ocular abnormality, confusion
        ii. Pseudodementia: depression, disturbed sleep pattern, sudden onset precipitated by emotional event
    k. Vascular dementia = 10 - 20%
    l. Early stage dementia is subtle and may be concealed by patient.
    m. Stuttering course points to multi-infarct

22. Clearance of C-spine
    a. No neck pain
    b. No neck tenderness (midline)
    c. No neurologic signs/symptoms

d. Reliable
    i. Clear sensorium
    ii. No drugs or alcohol
    iii. No distracting injury
    iv. Age more than 4 years
e. Lack of mechanism

23. Characteristics of heat stroke
    a. Temperature greater than 104°F
    b. Classic heat stroke
        i. The hallmark of heat stroke is altered mental status
        ii. May be associated with coagulopathy, mild lactic acidosis
        iii. Elderly, debilitated, sedentary
        iv. Associated with heat waves
        v. Anhidrosis common
        vi. Normal glucose
        vii. CK mildly increased
        viii. Oliguria
    c. Exertional heat stroke
        i. Extreme exertion
        ii. Sporadic occurrence
        iii. Young, healthy
        iv. Sweating preserved
        v. Hypoglycemia
        vi. Severe coagulopathy/DIC
        vii. Rhabdomyolysis
        viii. Acute renal failure
        ix. Severe lactic acidosis

24. Heat terminology
    a. Heat edema
        i. Ankles, feet, hands swollen
    b. Prickly heat
        i. Pruritic maculopapular rash due to inflammation of blocked sweat ducts
    c. Heat cramps
        i. Painful, involuntary contractions in calves, in people who previously sweat profusely
    d. Heat tetany
        i. Due to hyperventilation
    e. Heat syncope
        i. Fainting due to volume depletion, postural hypotension

f. Heat exhaustion
    i. Severe volume depletion, weak malaise, fatigue, orthostatic ↓ in BP
    ii. No neurological findings, temperature less than 104°F
g. Heat stroke
    i. Hyperpyrexia (greater than 104°F)
    ii. CNS dysfunction, ataxia
    iii. Anhydrosis (later)
    iv. Positive liver function tests

25. Heat-related illness
    a. Most common ECG finding is **QT prolongation**, which is also a common ECG finding in hypothermia
    b. Although bradycardia is common in hypothermia, it is not common in heat-related illness

26. Head trauma – concussion
    a. Patients may be amnesic for the event
    b. Patients may have insomnia, difficulty concentrating, and headaches
    c. Post-concussive syndrome
        i. Headache from weeks to years, dizziness, insomnia, anxiety, decreased concentration, possible change in mental function
        ii. No ataxia, no focal neurologic signs

27. 2011 Concussion Guidelines
    a. SCAT card used on field

1. Rest until asymptomatic (mental, physical) 2. Light aerobic exercise (exercise bike) 3. Sport-specific exercise 4. Non-contact training drills (weight lifting or sleds) 5. Full-contact training (after medical clearance 6. Return to competition (game play) ★ Each stage is about 24 hours or longer ★ Return to stage 1 if symptoms recur

    b. Guidelines designed to avoid **second impact syndrome**
        i. Sudden death that may result with a second concussion before complete recovery from the first one

c. Guidelines for children and adolescents
    i. No comprehensive **return-to-play** guidelines have been adapted for the young athlete and the majority of current and past studies were performed with older athletes

28. Hip injuries
    a. Posterior dislocation – most common (90%)
        i. Limb appears shortened, internally rotated, adducted, and flexed
        ii. 27% get osteoarthritis, 8 - 30% get avascular necrosis of femoral head
        iii. Dislocation must be reduced within 6 hours
    b. Anterior dislocation
        i. Limb is abducted, externally rotated

29. Acute thoracic aortic dissection
    a. Widened mediastinum most common abnormal finding
    b. 12% of patients have normal CXR
    c. 21% have normal mediastinum and aortic contour
    d. Nonspecific findings may be subtle and not typically picked up by ED physician
    e. Abnormal aortic contour in 50%
    f. Abnormal cardiac contour in 25%
    g. Pleural effusion in 19%
    h. Displacement of or abnormal calcification of aorta in 14%

30. AAA
    a. Definition > 3cm
    b. 90% begin below renal arteries
    c. 4 - 5 cm 50% are palpable
    d. 5cm are palpable but pulsatile abdominal mass felt in < 50%
    e. Grow at 4mm per year
    f. > 5 cm requires vascular surgeon
    g. Audible bruit is rare

31. Parapharyngeal abscess leading to sepsis
    a. Patients typically present after resolution of sore throat
    b. Can encroach on adjacent tissues
        i. Cervical sympathetic chair (Horner's)
        ii. Carotid artery and jugular vein (causing sepsis)
    c. Patients with this complication will present in severe sepsis
        i. Organ hyperfusion (AMS in this case)
        ii. Two of the following 4 (for diagnosis of SIRS)
            a) Fever > 38 or < 36
            b) Pulse rate > 90

c) RR > 20
d) WBC count > 12,000 or > 4,000 > 10% bands

32. Sore throat
    a. Retropharyngeal abscess
        i. 6 months - 3 years, severe airway obstruction, retropharyngeal lymph nodes, dysphagia, ill-appearing tripod, muffled voice
        ii. Beta hemolytic streptococcus
    b. Bacterial tracheitis
        i. Severe croup, patient not responding to racemic epinephrine, pus from ET tube
        ii. Staphylococcus
    c. Peritonsillar abscess
        i. More than 8 years old, dysphagia, trouble swallowing, trismus, deviated uvula
        ii. Most commonly streptococcus, may be polymicrobial
    d. Croup
        i. 6 months - 3 years, URI that worsens, worse at night, mildly ill, barky cough, stridor, dyspnea, subglottic inflammation, viral
        ii. CXR – steeple sign
        iii. Treatment
            a) Steroids
            b) Racemic epinephrine
    e. Epiglottitis
        i. 2 - 7 years, appears ill, dysphagia, drooling, distress, muffled voice, PE findings except for high fever normal, hyoid pain
        ii. Sits upright, head forward, thumb sign

33. Subdural hematoma
    a. Collection of blood below inner table of dura but external to the brain (between the cortex and venous sinuses – dissects the arachnoid away from the dura)
    b. Occurs in 33% of patients with severe head injury
    c. Headache
    d. Decreased LOC
    e. Bridging veins
    f. 25% are bilateral
    g. Crescent shape lesion on CT
    h. 30 - 60% mortality
    i. Acute, subacute (isodense, Coumadin), chronic

34. Epidural hematoma
    a. Classic: brief LOC, then lucid interval, then LOC
    b. Decreased LOC, ipsilateral pupillary dilatation due to compression of CNIII and its superficial parasympathetic fibers

c. Contralateral hemiparesis due to compression of ipsilateral cerebral peduncle – motor fibers cross below this level
d. Lenticular (football) shape lesion on CT
e. Mortality rate 0 - 20%
f. Middle meningeal artery injury
g. Tentorial herniation syndrome
    i. In 20% of cases, hematoma compresses the opposite side of the midbrain against tentorium edge resulting in contralateral pupil dilatation and ipsilateral paralysis
    ii. This is why bilateral burr holes are necessary; an ipsilateral burr hole doesn't work