**Question 1 (20 marks)**

With respect to the cervical spine:

a. List the two (2) components of the anterior column. (2 marks)
   - Anterior longitudinal ligament
   - Anterior ½ of vertebral bodies & disks

b. List the two (2) components of the middle column. (2 marks)
   - Posterior longitudinal ligament
   - Posterior ½ of the vertebral bodies & disks

c. List the six (6) components of the posterior column. (6 marks)
   - Facet joints
   - Pedicles
   - Laminae
   - Ligamentum flavum
   - Spinous process
   - Interspinous ligament

d. What is the role of flexion/extension x-rays in the initial Emergency Department investigation of traumatic cervical spine injury? (4 marks)
   - No role
   - Risk neurological injury if not performed correctly
   - No validated criteria for evaluating F/E studies
   - False-positives due to cervical muscle spasm
   - CT or MRI more appropriate

A 47 year old man is brought into your emergency department with fever, throat pain and difficulty swallowing.

e. State two abnormalities shown in this x-ray. (2 marks)
   - Enlarged epiglottitis- thumbprint sign
   - Enlarged retropharyngeal/ prespinal soft tissue shadow

f. List two (2) management steps that you would institute for this patient in the next 20 minutes. (2 marks)
   - Antibiotics- IV Ceftriaxone- REQUIRED
   - Position- sit upright
   - Advanced airway:
     o Prepare for RSI with direct video laryngoscopy/ senior anaesthetic support
     o Gaseous induction in OT best if situation permits
   - Adrenaline neb- Temporising measure if airway compromised
   - Analgesia- IV fentanyl/ morphine
   - Steroids- IV dexamethasone
Question 2 (12 marks)

A 65 year old man presents following a house fire.

a. Other than decreased conscious state, list two (2) indications for immediate intubation in this patient. (2 marks)
   • Impending complete airway obstruction
   • Hypoxia on maximal O₂
   • Significant hypovolaemia

b. List three (3) features shown in this image that predict the probability of significant airway burns. (3 marks)
   • Singed nasal hairs/ moustache
   • Soot on lips
   • Facial/ check burns
   • Oxygen requirement

c. The patient deteriorates and requires intubation. Your 1st attempt at direct laryngoscopy fails. List three (3) steps that you would institute to improve your likelihood of success for your next attempt. (3 marks)
   Any 3 of:
   • Ensure adequate sedation
   • Ensure adequate paralysis
   • Reposition head/neck
   • Cricoid manipulation- BURP
   • Introducer
   • Bougie
   • Different shaped blade
   • Smaller ETT size
   • Use of video laryngoscopy

d. What is the Brooke-Parkland formula? (1 mark)
   • 2-4 ml/kg/% burn area (lower mortality with 2%) added to maintenance

e. How is it applied? State 3 points of explanation. (3 marks)
   • Represents the addition fluid required over maintenance
   • ½ in 1st 8/24 (colloid)
   • ½ in following 16/24 (1/2 colloid ½ Hartmanns)
   • Gives starting guide for fluid maintenance- rate should be adjusted with aim of UO > 0.5ml/kg/hr
### Question 3 (12 marks)

<table>
<thead>
<tr>
<th></th>
<th>Non specific vulvovaginitis</th>
<th>Trichomonas</th>
<th>Bacterial vaginosis</th>
<th>Candidiasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra info for you only</td>
<td>Mixed vaginal / enteric flora</td>
<td>Trichomonas vaginitis</td>
<td>Gardnarella vaginalis &amp; mixed anaerobes</td>
<td>Candida albicans RF $\rightarrow$ DM, OCP, Abs, pregnancy Uncommon b4 puberty (non oestrogenised epith resist )</td>
</tr>
<tr>
<td>Sexually transmitted Yes/No</td>
<td>No</td>
<td>Nearly always</td>
<td>+/- Normal commensal May be STI</td>
<td>No (Normal flora in 50% Growth ltd by other orgs)</td>
</tr>
<tr>
<td>Discharge quality</td>
<td>Uncommon</td>
<td>Frothy, fishy smell</td>
<td>Malodorous (fishy) White grey</td>
<td>White</td>
</tr>
<tr>
<td>Other symptoms</td>
<td>Itch, dysuria</td>
<td>50 % with are asympt.</td>
<td>Usu no redness/ soreness</td>
<td>Itch, pain</td>
</tr>
<tr>
<td>Examination findings</td>
<td>Little d/c, erythematous swollen vulva, distal vagina +/- inflamed</td>
<td>Vaginal mucosa diffusely erythematous Strawberry cervix (punctate haem)</td>
<td>Mild (if any redness)</td>
<td>White adherent plaques Occas. red vaginal wall</td>
</tr>
<tr>
<td>Laboratory Diagnosis Method</td>
<td>Micro- motile, pear shaped flagellated trichomonads</td>
<td>Clue cells $\rightarrow$ bacteria attached to epithelial cells on micro</td>
<td>Micro spores, pseudohyphae</td>
<td></td>
</tr>
<tr>
<td>Male partner treatment Yes/ No</td>
<td>No</td>
<td>Yes (90% symptomatic)</td>
<td>No</td>
<td>Only symptomatic</td>
</tr>
<tr>
<td>Possible additional Q: Treatment</td>
<td>Attention to hygiene</td>
<td>Metronidazole/ tinidazole 2g a single dose Preg clotrimazole 2% 7/7 Metronidazole 400mg bd 7/7 Or tinidazole 500 mg 7/7 Single dose cure rate lower Preg - Clindamycin 300mg bd 7/7</td>
<td>Clotrimazole 2% cream PV 3/7 500mg pessary only Nystatin cream bd 7/7 Not responding (not pregnant) $\rightarrow$ fluconazole 150 mg single $\rightarrow$ may be glabrata (resistant) $\therefore$ $\rightarrow$ Boric acid 600mg 14/7</td>
<td></td>
</tr>
</tbody>
</table>
Question 4 (12 marks)

a. State the three (3) cardinal clinical features of serotonin syndrome. (3 marks)
   - Alteration in behaviour/cognitive ability
   - Autonomic nervous system overactivity (sweating, rigors, diarrhoea, CVS instability)
   - Neuromuscular activity (rigidity, hyperreflexia, jerks, myoclonus, hyperthermia)

b. List three (3) different agents that may lead to serotonin syndrome (each to be from a different class of medication). (3 marks)
   - Analgesics- fentanyl, pethidine, tramadol
   - Antidepressants- TCA
   - Lithium
   - MAOIs- Moclobemide, phenelzine
   - SSRI- citalopram, escitalopram, fluoxetine, fluvoxamine, paroxetine, sertraline
   - SNRIs- venlafaxine, buropion
   - DOA- Amphetamines, Ecstasy, MDMA
   - Herbal- St John’s wort

b. List three (3) key steps in the management of a patient with suspected serotonin syndrome. State one (1) justification for your choice of each step. (6 marks)

<table>
<thead>
<tr>
<th>Management step</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Withdraw inciting agent</td>
<td>Reduce ongoing morbidity</td>
</tr>
<tr>
<td>IV fluids</td>
<td>Fluid balance monitoring</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>Oral/ IV</td>
</tr>
<tr>
<td></td>
<td>↓ muscle activity/ rigidity and → ↓ temperature</td>
</tr>
<tr>
<td></td>
<td>(?non-specifically inhibit serotonin neurotransmission)</td>
</tr>
<tr>
<td></td>
<td>↓ anxiety/ agitation</td>
</tr>
<tr>
<td></td>
<td>For seizures</td>
</tr>
<tr>
<td>NM paralysis</td>
<td>If hyperthermia severe</td>
</tr>
<tr>
<td>Non specific serotonin (5HT1, 5HT2) antagonists</td>
<td>For significantly altered mental state or Haemodynamic instability</td>
</tr>
<tr>
<td></td>
<td>Cyproheptidine, propranolol, methysergide and Chlorpromazine tried → No RCT trials</td>
</tr>
<tr>
<td></td>
<td>Cyproheptidine → H₁ receptor antagonist with antimuscarinic, 5HT₁₄(d) + 5HT₂ receptor antagonist</td>
</tr>
<tr>
<td></td>
<td>anecdotally effective fewer SFx that others. Only available orally.</td>
</tr>
<tr>
<td></td>
<td>4-8mg 8/24efficacy ↓ if charcoal given</td>
</tr>
<tr>
<td></td>
<td>Chlorpromazine → Blocks D2, α- adrenergic, 5HT₂ receptors and has anti muscarinic effects, advantage can be given IV.</td>
</tr>
<tr>
<td>Disposition</td>
<td>Ward if mild</td>
</tr>
<tr>
<td></td>
<td>Mod- severe- HDU/ ICU- needs close physiological observation</td>
</tr>
</tbody>
</table>
Question 5 (12 marks)

A 54 year man with no prior medical history presents to your tertiary centre emergency department with one hour of chest pain. His observations are:
BP 100/60 mmHg  RR 28/min  O2 saturation 100%  10 L/min O2 via Hudson mask

a. State three (3) key abnormal findings shown in this ECG. (3 marks)
   •  STE II, III, AVF > 10 mm, V6 2 mm  c/w Inf STEMI
   •  STD I, aVr, aVI, V2- V5 anterior changes c/w reciprocal change
   •  Rate 150 bpm
   •  Rhythm NCT, irreg, irreg c/w AF

b. What is the significance of these findings? (3 marks)
   •  Inf STEMI clear given reciprocal change meeting criteria for urgent reperfusion therapy (required to pass this section)
   
   Any of the following for the next 2 marks:
   •  Possibly RV/ posterior involvement
   •  Care with hypotension- avoid GTN/ morphine- needs filling if ↓ BP
   •  Anticipate bradycardia

c. List three (3) immediate specific treatment tasks. Provide details for each step. Specify doses and routes of administration for any drugs used. (6 marks)
   •  Aspirin 300mg
   •  Clopidogrel300mg if followed by thrombolysis 600mg if followed by PCI
   •  Ticagrelor 180mg
   •  Heparin
   •  Oxygen Sat < 95%
   •  Isoprenaline
   •  Atropine
   (not thrombolysis at a tertiary centre would expect PCI)
Question 6 (12 marks)

A 70 year old woman presents with two days of increasing abdominal pain and vomiting.

a. List three (3) abnormal findings shown in her xray. (3 marks).
   - Small bowel loop dilatation- SBO
   - Large bowel loop distension- LBO
   - No gas in sigmoid colon/ rectum
   
   NB: no free gas

b. List six (6) pathological causes for this X-ray appearance. (6 mark)
   - Stenosing malignancy
   - Adhesions
   - Ischaemic bowel
   - Faecal impaction
   - Hernia- internal/ external
   - Omental metastases
   - Diverticulitis
   - IBD- Crohn’s disease

c. List three (3) key management tasks in the first 1 hour of your care. (3 marks)
   - IV fluids
   - Analgesia
   - NGT
Question 7 (13 marks) 6 minutes

A 2 year old girl presents with abdominal pain.

a. List five (5) features on assessment that would support the diagnosis of intussusception. (5 marks)
   - Paroxysms of pain
   - Red currant jelly stool (late sign)
   - Pallor/ unwell looking
   - Sausage shaped loop in RIF on erect AXR
   - US- visualisation of the intersusseptum

b. List the 2 management options used to treat confirmed intussusception. (2 marks)
   - Gas insufflation via rectum
   - Surgical decompression via laparotomy

c. List six (6) other common causes of abdominal pain for this patient. (6 marks)
   - UTI
   - Constipation
   - Gastroenteritis
   - Appx
   - Mesenteric adenitis
   - Pneumonia
   - Trauma- solid organ contusion/ bleeding
   - DKA
   - Toxic ingestion

NB: Stress the word COMMON and don’t accept uncommon causes
“Functional” is not very common in 2 year olds- there are better examples to choose = no marks
With all of the appropriate choices above, why choose “non specific” abdominal pain?

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Question 8 (12 marks)

A 25 year old male presents to the emergency department after a motorcycle collision. His only complaint is severe left arm pain.

![X-ray image]

a. State three (3) abnormal findings shown in this Xray. (3 mark)
   - # midshaft radius comminuted, 100% displaced dorsally with volar angulation ~ 25°
   - Distal radioulnar jt dislocation, dorsal displacement of distal ulnar (Galeazzi)
   - Marked ST swelling

b. List five (5) early complications that would require urgent intervention. (5 marks)
   - Severe pain
   - Ischaemic digit- absent distal pulses/poor perfusion
   - Neurological compromise
   - gross wound contamination
   - open joint or fracture/bone on view
   - compartment syndrome
   - evidence of infection
   - nerve damage (median/ulnar nerve)
   - fat embolism

c. List four (4) late complications associated with this injury. (4 marks)
   - nerve palsy- interosseous branch of the radial nerve
   - chronic pain reflex sympathetic dystrophy
   - osteomyelitis
   - ischaemic contractures
   - malunion/delayed union/non-union
   - skin loss requiring repair/chronic wound
   - arthritis
   - Infection - post OT or open wound
Question 9 (17 marks)

a. Complete the table to distinguish between the clinical features (Clinical features = Hx & Ex) of peripheral and central vertigo. (9 marks)
   - Any 6 of the following worth 1.5 mark (Q with ½ marks will not be asked)
   - Specific symptoms or signs may be split ie ear pain and tinnitus can be 1 mark each
   - NB: onset cannot be used to differentiate- both may be abrupt onset depending on subtype of peripheral or central

<table>
<thead>
<tr>
<th>Clinical feature</th>
<th>Peripheral</th>
<th>Central</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing loss symptom</td>
<td>Often present</td>
<td>Rare</td>
</tr>
<tr>
<td>Other ear symptoms</td>
<td>Pain, tinnitus, discharge</td>
<td>Rare</td>
</tr>
<tr>
<td>Other neurological symptoms</td>
<td>Rare</td>
<td>Common- eg diplopia, paraesthesia, limb weakness, dysarthria, dysphagia</td>
</tr>
<tr>
<td>Nystagmus</td>
<td>Unidirectional/Horlizontal Constant direction Delayed onset from stimulus Fatigable</td>
<td>Usually absent Bidirectional/ rotatory No latency from stimulus onset Does not fatigue</td>
</tr>
<tr>
<td>Hallpike</td>
<td>Nystagmus- unidirectional, fatigable</td>
<td>Nystagmus- instantaneous, multidirectional, non fatiguing</td>
</tr>
<tr>
<td>Hearing loss sign</td>
<td>Often</td>
<td>Rare</td>
</tr>
<tr>
<td>Other neurological signs</td>
<td>Absent (VIII only)</td>
<td>Usually present</td>
</tr>
<tr>
<td>Course</td>
<td>Self resolving</td>
<td>Persistent relapsing</td>
</tr>
</tbody>
</table>

b. Assuming the diagnosis of benign positional vertigo, list eight (8) steps in repositioning therapy. (8 marks)
   - Sit upright head central
   - Rapid head down 30° below flat facing to affected side noted on Hallpike’s
   - Hold in position for ~ 1 min until symptoms resolve
   - Rotate head to other side in same 30° down position
   - Hold in position for ~ 1 min until symptoms resolve
   - Continue rotation to face facing floor
   - Hold in position for ~ 1 min until symptoms resolve
   - Sit upright, head central for > 20 min

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