# Renal and Urology Fellowship Questions

**HOT TOPICS**

UTI/Pyelonephritis - paed

Acute Renal Failure

Rhabdomyolysis

Hyperkaleamia dialysis patient

Subacute Bacterial Peritonitis in PD Patient

Renal Transplant patient

HUS Paed

PSGN

Renal Colic SSU Patients

Torsion

(Para)Phimosis

Priapism

**Trainee Topics**

- Danika - Acute Renal Failure Adult

- John - Post Strep GN

- Claire- Rhabdo and Renal Failure

- Sarah - Testicular Pain in a teenager

**Question 1**

**(13 marks)**

**A 46 years old female presents to ED after a brief episode of witnessed unconscious collapse in the foyer of the hospital. She did not hit her head. She is a haemodialysis patient and was on her way to the dialysis unit for her treatment. She feels short of breath and missed her last dialysis session 2 days ago. She has a history of IHD, AF, heavy smoker and hazardous alcohol use with frequent binge drinking.**

**Her observations and ECG are shown below**

**GCS 14**

**P 110**

**Sats 94% RA**

**RR 22**

**Temp 37.7**

**BP 90/50**



i. List the five (5) **MOST LIKELY** causes of her collapse that you will seek to identity

(5 marks)

Hyperkalaemia with subsequent arrhythmia

Cardiac failure/fluid overload with poor cardiac output

Cardiac Arrhythmia

Cardiac Ischaemia

**Pulmonary Embolus**

Seizure secondary to alcohol/withdrawal

Sepsis – any focus (only a single mark if multiple infections given)

ii. List four (4) abnormal features on the ECG

(4 marks)

RBBB

Extreme right axis deviation (+180 degrees)

S1 Q3 T3

T-wave inversions in V1-4 and lead III

Clockwise rotation with persistent S wave in V6

**The renal registrar calls the department to ask whether the patient will be able to attend dialysis in her allocated slot 90 minutes from now**

iii. List the four (4) **MOST** important tests you would like to perform in the next 60 minutes prior to answering the renal registrar’s question.

(4 marks)

Venous blood gas to check potassium

CXR to guide onward imaging

CTPA or VQ

Trop to delineate ischaemia or massive PE

**Other tests are important but not THE MOST IMPORTANT**

**Question 2**

**()**

**A 66 year schizophrenic old man presents with first episode of left loin pain radiating to his umbilicus. He has been given morphine. The RMO thinks that the patient is suitable to go to the ED Short Stay Unit (SSU) to wait for his CTKUB.**

**Observations**

**P 90**

**BP 160/90**

**Sats 98**

**RR 12**

**T 37.0**

i. List five (5) features in the ASSESSMENT of this patient that would exclude this man from being sent to SSU

Significant acute renal dysfunction/elevated Cr

Pain that has lasted for more than 24hrs/48hrs – unlikely to pass, suggests large impacted stone

Fevers/signs of sepsis (hypotension/tachycardia/tachypnea)

UA has leucs/nitrites

Unable to pass urine (??)

Diagnosis uncertain e.g. features that might suggest AAA/bowel obstruction

Patient has a single kidney/significant underlying chronic renal impairment

Significant comorbid conditions/immobility likely to impact need for admission

Social situation that may preclude discharge

Uncontrolled pain despite opiate and NSAID analgesia

Violent or disruptive behaviour

**The man is transferred to short stay, he is given Panadol and indomethacin with good effect and his observations are now within normal limits. There are no striking abnormalities on routine bloods. The image below shows the a subsequent slice of the man’s CT**



ii. What is the most striking abnormality on the CT

(1 mark)

Large infrarenal AAA

**The diagnosis is explained to the patient**

iii. List the next five (5) actions you will take immediately

(5 marks)

Move patient to resus/full continuous monitoring

Contact surgical team/ICU/Anaesthetics asap – likely needs urgent OT

Large wide bore access x2 minimum

Crossmatch blood pre-empting rupture/OT

IDC/CVC/Aline all appropriate if not delaying definitive management

Arrange Aortagram (patient stable currently and will help with surgical planning)

**Question 3**

**(14 marks)**

**A 6 year old boy presents 1 week after the onset of diarrhoeal illness. He initially had bloody motions but today passed a semi formed stool. He is lethargic, nauseated and pale. Mum states that he has not passed much urine for 24 hrs. He is clinically euvolamic. He was seen in ED 1 week prior and had normal bloods including EUC, FBC and CRP.**

**His observations and currently available pathology results are shown below**

**BP 130/95 pH 7.21 Na 136 BC – pending**

**P 130 pCO2 19 K 6.6**

**Sats 98% RA HCO3 14 Ur 7.0**

**RR 40 Lact 3.2 Cr 180**

**T 37.3 Cl 98**

**Hb 90**

 **Plt 70**

 **WCC 15.4**

 **CRP 45**

**Stool culture – pending**

**BC – pending**

i. Interpret the bloods gas result, including any calculations you would perform

(5 marks)

High Anion Gap metabolic acidosis (lactate) and respiratory alkalosis

Winters formula 1.5 x HCO3 +8 (+/-2). Expected CO2 = 29 (+/-2)

Anion Gap = 136 – 98 – 14 = 28

Delta Gap = AG/HCO3 change = 28-12/24-12 = 14/12 = Between 1 and 2 (uncomp HAGMA)

ii. List your most likely and 3 other differential diagnoses for this presentation

(4 marks)

**HUS**

TTP (neuro sx can be present) – Remember FATRN – Fever/Anaemia/Thrombocytopenia/Renal Failure/Neuro sx

DIC

Sepsis secondary to a diarrhoeal illness – with lactic acidosis

Any other cause of haemolysis

iii. List the five (5) MOST important additional tests that you will request in ED, with reasons for each

(5 marks)

ECG – to check for signs of hyperK and guide Ca treatment vs other hyperK Rx alone

Urine dipstick – check for urine casts, infection,

Coags – check for DIC secondary to sepsis

Haemolysis screen/Blood Film– retics/haptoglobins

Renal USS – to check for intrinsic renal anatomical issues

iv. List the organism that is most likely implicated

(1 mark)

E.Coli 0157 – shiga toxin causes the disease

**Question 4**

**(13 marks)**

**A 3 years old African refugee presents to ED with priapism. He is screaming in pain and refusing to let anyone examine him.**

i. List the stepwise actions you will take to manage this situation, assuming at each stage that the action is unsuccessful in resolving the priapism

(5 marks)

Analgesia – titrated opiates +/- penile block under sedation - may need ketamine/nitrous to control

IV fluids - warmed

Aspiration of cavernosum with 2 x butterfly needles

Cavernosal irrigation with 1:1000000 adrenaline or phenylephrine or metaraminol

Surgical consultation for operative intervention

Transfusion/Exchange transfusion

ii. What is the most likely cause of prispism in this child

(1 mark)

Sickle Cell Disease

iii. In the table below compare low and high flow prispism

(8 marks)

|  |  |  |
| --- | --- | --- |
|  | Low Flow Priapism | High Flow Priapism |
| Degree of Pain |  |  |
| Causes |  |  |
| Blood Gas Analysis of Cavernosal Aspirate |  |  |
| Treatments |  |  |

|  |  |  |
| --- | --- | --- |
|  | Low Flow Priapism | High Flow Priapism |
| Degree of Pain | Painful | Painless |
| Causes | Drugs e.g Viagra/neuroleptics/ antihypertensivesSickle Cell | Fistula/Trauma |
| Blood Gas Analysis of Cavernosal Aspirate | Ischaemic, acidotic blood | Normal |
| Treatments | As above in i.  | Surgical/Embolisation |

**Question 5**

**(14 marks)**

**A 34 year old male presents to ED with 2 days of gradual mild right-sided abdominal pain deteriorating renal function. Bloods taken by the GP 2 days ago show a creatinine rise from 120 to 230. He has no upper GI symptoms, no urinary Sx or bowel habit alteration. He had a renal transplant 2 months ago for IgA nephropathy and is taking prednisolone, tacrolimus and mycophenolate mofetil.**

**BP 230/120**

**P 120**

**Sats 98%**

**RR 24**

**T 38.5**

i. List five (5) likely potential causes for this patient’s presentation

(5 marks)

Mechanical surgical issue – obstruction/anastomosis issue/leak/thrombosis

Vascular – RAS/RV thromb

Infection – transplant pyelo/UTI

Rejection –acute

Nephrotoxic drug effect of

Non renal issue e.g gallstones/appendicitis (much less likely – only allow 1 non transplant related cause)

ii. In the table below outline the **MOST IMPORTANT** initial investigations you will perform with a reason for each

|  |  |  |
| --- | --- | --- |
| **Bedside Tests (3 marks)** | **Laboratory Tests (4 marks)** | **Imaging Tests (2 marks)** |
| TEST:REASON: | TEST:REASON: | TEST:REASON: |
| TEST:REASON: | TEST:REASON: | TEST:REASON: |
| TEST:REASON: | TEST:REASON: |  |
|  | TEST:REASON: |  |

|  |  |  |
| --- | --- | --- |
| **Bedside Tests** | **Laboratory Tests** | **Imaging Tests** |
| ECGCheck for hyperK changes | EUCDecline in renal function/K | Renal USS Check for signs pyelo/graft obstruction |
| Urine DipCasts – rec glomerulonephLeuc/nit/bld- pyelo | Blood cultures Guide abx | CXRAs part of septic workup in immunocomp pt/?pulm oedema |
| VBGQuick check K/Cr/for acidosis and lactate in sepsis | FBC ?neutropenia with immunosurp |  |
|  | Tac/MM levelsTo determine if toxic levels |  |

**Question 6**

**(12 marks)**

**A 50 year old man presents in cardiac arrest. He has been unwell at home, in bed, for 1 week with diarrhoea and vomiting. He has a history of AF, IHD, and peri-dialysis diabetic nephropathy. He was being worked up for renal transplant and has a fistula in his left arm which is still immature. He takes digoxin, aspirin, amlodipine, allopurinol and simvastatin.**

**He has been shocked 3 times en route to ED and has the ALS algorithm has been initiated in the resus bay. He has been intubated**

i. In the table below the four (4) MOST likely reversible causes for this man’s cardiac arrest

(4 marks)

Hyperkalaemia secondary to dehydration and renal failure

IHD given history

Sepsis/dehydration due to intraabdominal cause/gastro

PE due to immobility and dehydration

Digoxin toxicity

**After 4 cycles of CPR you get ROSC.**

**The ECG and VBG are shown below**



pH 7.10

pCO2 79

HCO3 12

Lactate 9.0

Na 124

K 8.0

Cl- 98

ii. What is the abnormality seen on the ECG

(1 mark)

Bidirectional VT

iii. Interpret the blood gas including any calculations you will perform

(4 marks)

Respiratory and Metabolic Acidosis

Winters formula (HCO3 x 1.5) +8 (+/-2) Expected C02 = 36 +/-2 – inadequate compensation

HAGMA = (124+8) – (98 – 12) = 22

iv. List the three (3) MOST immediate treatments you will administer to the patient to address the underlying cause of the arrest

(3 marks)

Digibind 20 amps

Insulin 10 units actrapid and 50mls 50% dextrose

Bicarbonate 100mls 8.4% - can be repeated

Salbutamol continuous via ETT or IV

(DC shock very unlikely to be effective in digoxin tox)

Calcium Gluconate 20mls 10% - repeat – theoretically contraindicated but in the case of severe hyperK?? where unsure if digoxin truly the issue or other it can be considered – if ever writing to give it in digoxin tox need to make a statement around this

Question 7

(13 marks)

A 78 year old demented indigenous man from a nursing home presented to ED yesterday in urinary retention. He had a catheter inserted by the intern who it appears forgot to replace the foreskin after the procedure. There is no surgical team at your rural hospital site

The image shown below outlines the current problem.



i. What is the abnormality shown

(1 mark)

Paraphimosis

ii. List the stepwise actions you will attempt to deal with the problem, assuming at each stage you are unsuccessful

(4 marks)

Analgesia (titrated IV opiates and lingo gel), lube to foreskin and glans then gentle traction to the foreskin

Compression bandage and ice to try and reduce swelling then retry

Multiple pin pricks to oedematous foreskin to let out oedema fluid (Dundee-Perth technique)

Penile block with lignocaine and dorsal slit to foreskin with iris scissors

**The intern who saw the patient is very distressed. She wasn’t aware of the need to replace the foreskin after catheterisation. She states that she was supervising the medical student who actually inserted the catheter. The consultant who was on duty yesterday is not available at present.**

iii. In the table below list the issues that need to be dealt with and the actions you will take

(8 marks)

|  |  |
| --- | --- |
| **Issue** | **Action** |
|  |  |
|  |  |
|  |  |
|  |  |

|  |  |
| --- | --- |
| **Issue** | **Action** |
| Knowledge gaps for intern/med student | Teaching sessions, resources, use of task trainers |
| Distress of intern | Counsel, follow up, ensure support/mentoring |
| Medical error | RiskMan report, investigate, feedback, open disclosure to patient/family, produce guideline if approprate |
| Inadequate supervision of junior staff | Discussion with consultant and wider group regarding appropriate supervision requirements |

**Question 8**

**(7 marks)**

**A 59 years old female has been brought to your resus bay with a fever and confusion. She usually performs home peritoneal dialysis but has been unwell and did not complete it for the last 2 days. She is unable to give much history. She lives alone and her sister found her sitting on the floor in the bathroom. She has full non-invasive monitoring in situ and two 18G cannulas. She is trying to climb out of bed and is currently being physically restrained**

**PMH – Type 2 DM, IHD, AF, replacement of Tenchkoff catheter 4 days ago**

**P 130 pH 7.14**

**BP 70/50 pCO2 22**

**Sats 91% RA HCO3 14**

**(99% on 15L) Lact 4.3**

**RR 28 Na 131**

**T 38.9 K 5.7**

**GCS 12 (M 5, V3, E4) Cr 490**

 **Cl 102**

 **Hb 105**

**Blood has been sent for FBC, EUC, LFT, BC, CMP, CRP and results are pending**

**UA from IDC specimen – leuc trace, blood neg, nit neg**

**Her CXR is shown below**



i. What is the one (1) most obvious abnormality on the CXR

(1 mark)

Free intraperitoneal gas

ii. List the two (2) most important further investigations would you like to perform to define the underlying cause

(2 marks)

**MCS of peritoneal diasylate fluid- ?cloudy/high leuc count/positive for bacteria**

CT Abdomen - ?perforation/complication during catheter replacement or gas just due to replacement

iii. Outline four (4) immediate treatments for this patient

(4 marks)

IV Fluid boluses 500mls repeated

Metaraminol 1mg boluses for BP management +/- Noradrenaline if non responsive to fluid therapy

Sedation for control –droperidol/ketamine/midazolam –any appropriate agent

Antibiotics – broad spectrum IV – Source Unknown regime ( fluclox 2g/gent 5-7mg/kg/vanc 25-30mg/kg) OR GI source (Amp/Gent/Metro)

OR

Intraperitoneal antibiotics if cloudy effluent (Cefazolin or ceftaz 20mg/kg, Gent 0.6mg/kg to 50mg +/- Vanc)

Intubation may be appropriate for control of patient – however needs to come with a statement that demonstrates an understanding of the issues around potential deterioration and measures taken pre intubation to mitigate risks

**Question 9**

**(12 marks)**

**A 9 week old boy presents with a reported fever at home. He has no overt focus on full clinical examination and looks well. He is feeding well, has good hydration and normal amounts of wet nappies. You are keen to get a urine sample.**

**P 180**

**BP 90/60**

**Sats 98**

**RR 40**

**T 36.9**

i. List three (3) methods of gaining a urine sample with 1 pro and 1 con of each.

(9 marks)

|  |  |  |
| --- | --- | --- |
| Method | Pro | Con |
|  |  |  |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| Method | Pro | Con |
| Clean Catch | Requires no invasive or distressing proceduresPainlessParents can catch | Can be contaminated if parents touch pot on perineum (25%)Can take a long time/Often missedRequires commitment from parents |
| IDC/In Out Catheter | Relatively clean/Sterile – more so than clean catch3% risk contamination | Can be distressing to childSmall risk of urethral trauma3% risk contamination |
| SPA | Very clean and controlledQuick, no waitingMethod of choice in a <3 mth old | Small risk of damage to other structures – although inconsequential usually even if hit bowelDistressing to parent and child |
| Bag Urine(Not really recommended) | Non invasiveRequires no parental input | Only useful if dipstick entirely normalOften contaminatedSlow |

**The most sterile method of collecting urine is utilised and the following result is obtained**

**SG 1.02**

**pH 6.0**

**Leuc 2+**

**Nit pos**

**Ket neg**

**Gluc neg**

ii. List your three (3) MOST important investigation and management steps

(3 marks)

Admit paeds for IV abx (Ben Pen and Gent) given persistent tachycardia and risk of sepsis in young age is ideal

If patient is discharged MUST state that FU arranged within 24hrs/planned rv in ED and started on po abx with Bactrim or ceflex – appropriate safety netting

USS as male <3 months mandatory pre discharge

+/- bloods – In this age group not unreasonable to do WCC/CRP/BC

**NOTE: No need for IV fluids/IDC/other management as child well**

**Doesn’t need an LP as >1mth and well**