

FEX Net 2022 Collated SAQs

Paediatrics: Answers

1. Abdominal Pain
2. Anaphylaxis
3. Arm Pain
4. Asthma
5. Bronchiolitis
6. BRUE
7. Crying
8. D+V
9. FBC
10. Febrile Rash
11. Fever
12. Floppy infant
13. Hypoxia
14. Jaundic
15. Labour
16. NAI
17. Neonatal jaundice
18. Non-Weight Bearing
19. Poor Feeding
20. Rash
21. Seizure
22. Sick Baby
23. Sick Neonate
24. Syncope
25. Vomiting
26. Wheeze

Question 1

1.

Dilated loop of large bowel with telescoping segment – intussusception

Pass 2 of 2 (1 mark for intuss 1 mark for description)

2.

Analgesia – IV morphine aliquots 1mg (2 marks)

IV fluid bolus – N/S 20ml/kg (approx. 340mL) aiming for pulse <120, cap refill <2-3s (2 marks)

Urgent referral to paediatric surgical centre (1 mark)

Pass 3 of 5

3.

Gas insufflation PR – radiological procedure – for uncomplicated cases, first line management

Surgical correction – for failure of gas reduction, for complicated cases ie perforation

1 for option 1 mark for when

Pass 2 of 4

4.

Perforation / sepsis

Intestinal ischaemia

Must have 1 of these , others may be acceptable

Pass 1 of 2

Total pass 8 of 13 corrects to 6/10

Question 2

A 7 year old boy is brought by ambulance to your emergency department from a local primary school; they are accompanied by a teacher.

He has a widespread erythematous rash and difficulty breathing shortly after eating a sandwich from his friend's lunch box that contained peanut butter.

He has no known allergies.

His vital signs are:

HR 140 bpm
SaO2 90% on room air, with wheeze, no stridor
RR 42 bpm
BP 75/45 mmHg
GCS 15/15

a) What is the estimated weight for this patient? (Please include your formula) **(2 marks)**

- Expected weight for a 7 year old = $(7 + 4) \times 2 = 22$ kg (APLS)
- $(3 \times \text{age}) + 7 = 28$ kg (new version)
- $4 \times \text{age} = 28$ kg (Resus.me 5-14y/o)

The resuscitation team have moved him to a resuscitation bay and they have applied high-flow oxygen.

- b) What three (3) most important treatments would you prescribe for this patient? Complete the table below with treatments and details. **(6 marks)**

	Treatment	Details (dose, concentration, route)
1	adrenaline	10 microg/kg, 0.01 ml/kg of 1:1000 = 0.22 ml IMI
2	salbutamol	nebuliser 5mg
3	0.9% NaCl	Up to 20ml/kg (440ml) IV bolus

One of the child's parents has arrived and after a period of observation you decide they require referral to an inpatient team.

- c) List four (4) indications for referral for inpatient team admission. **(4 marks)**

- Required >1 dose of adrenaline
 - Severe asthma or history of biphasic reactions
 - Possible continued allergen absorption
 - Patient has difficulty responding to deterioration, no easy access to emergency care
 - Presenting to ED in the evening or night
 - Parental anxiety
 - (Severe idiopathic anaphylaxis)- in this case likely nuts
 - (slow response to adrenaline, requirement for inhaled beta agonists, initial hypotension)- are all RFs for biphasic reactions
- Pass mark 2+4+3= 9/12

Question 3

1.

Spiral fracture of left humerus (diaphysis)

Fracture consistent with physical child abuse; inconsistent with age

2.

Thorough exam for other signs of abuse/neglect (max 2 marks for other signs abuse)

- Other fractures
- Burns
- Bruising/bite marks

Developmental assessment for growth retardation and developmental milestones

Exam for other features of primary bone disorders/renal disease

3.

Analgesia – paracetamol 15mg/kg, ibuprofen 10mg/kg

Immobilisation in plaster (given age)

Admission for further investigation of fracture and social circumstances

Notification of child protection authorities

Candidate number _____

Question 4

agitated, distressed, mod to marked wob, tachycardia, marked limitation of ability to talk

q2 out of 3

02/salbutamol/ipratropium/pred

others

Mg/nebs/methylpred/aminophylline

q3 out of 4

adequate oxygenation, adequate oral intake, salbutamol weaned to 3-4 hourly,

adequate parental education and ability to deliver salbutamol/appropriate follow up

Question 5 (12 marks)

A 5 month old boy brought in by his parents appears breathless and is “off his feeds.” Your provisional impression is bronchiolitis.

- i. Name three common organisms which cause this illness (3 marks)

- RSV, human metapneumovirus, parainfluenza virus, influenza virus, adenovirus, enteroviruses, rhinovirus

- ii. List 4 clinical features which would indicate a severe episode warranting admission (4 marks)

- Increased irritability or lethargy
- Marked increase in respiratory rate
- Marked chest wall retraction
- O2 sats < 90% on room air
- Poor feeding
- Apnoeic episodes (or history of same from home)

- iii. Complete the following table describing the rationale for each investigation in a child with bronchiolitis (3 marks)

Investigation	Indication/Rationale
Chest Xray	In general not indicated Indicated if there are focal findings (suggesting consolidation) or diagnostic uncertainty (e.g. kid with murmur → ? CCF)
Nasopharyngeal aspirate	Varies b/w hospitals Some guidelines state “should not be done” Many centres use for cohorting/infection control
Blood gas	Not usually indicated Can be performed in deteriorating child though need for ICU etc remains a predominantly clinical decision

iv. This illness is contagious. List 2 ways to reduce transmission in hospital (2 marks)

- Barrier nursing: wear gloves and gown. Face shield if resp droplets likely to contaminate face
- Frequent hand decontamination with gel – wash with soap 1st if soiled
- Isolate patient in the ED and ward
- Wipe equipment & environment with suitable disinfectants

Question 6 (15 marks)

List the criteria to say a child had a Brief Resolved Unexplained Event (BRUE) (5 marks)

- Occurred in an infant less than 12 months old
- Less than one minute duration but typically 20 – 30 seconds.
- Accompanied by a return to a baseline state
- Not explained by identifiable medical conditions.
- Characterised by ≥ 1 of the following
 - Central cyanosis or pallor
 - Absent, decreased or irregular breathing
 - Marked change in tone. (hypertonia or hypotonia)
 - Altered level of consciousness

List 5 differential diagnosis of BRUE in broad categories with 1 specific example each (5 marks)

- Normal physiological response: laryngospasm, gagging
- Inflicted injury: (shaken baby, drug overdose, Factitious illness by proxy or intentional suffocation)
- Infection : Pertussis, septicaemia, pneumonia, meningitis,
- Airway obstruction: congenital abnormalities, infection, hypotonia
- Abdominal: intussusception, strangulated hernia, testicular torsion
- Metabolic problems: hypoglycaemia, hypocalcaemia, hypokalaemia, other inborn errors of metabolism
- Cardiac disease: congenital heart disease, arrhythmias, vascular ring, prolonged QT.
- Respiratory: inhaled FB
- Toxin / Drugs: accidental or non-accidental
- Neurological causes: head injury, seizures, infections, cerebral malformations etc.

Describe the features of a Lower Risk BRUE (5 marks)

- occurs when there are no concerning features on history or examination
- Age > 60 days
- Born ≥ 32 weeks gestation and corrected gestational age ≥ 45 weeks
- No CPR by trained healthcare professional
- First event (cannot be lower risk if event has been repeated)
- event lasted < 1 minute

Question 7

1.

Non-Accidental Injury – signs of trauma – bruising, swelling,

Sepsis – fever, poor perfusion, focal signs infection

Occult trauma – corneal abrasions/ skin tourniquet

Surgical – herniae, abdominal findings – distension, bilious vomiting

Congenital cardiac – cyanosis, sweating while feeding, heart sounds

Colic / reflux – observe reflux

2.

History of depression

Prior post-partum depression

History of other mental illness – bipolar

Recent stressors – pregnancy complications, job issues, health problems

Baby has health problems or special needs

Feeding difficulties

Relationship issues

Lack of supports

Unwanted pregnancy

3.

Psychosis

Admission of thoughts of infanticide/harm

Thoughts of self-harm

Any suicidality (any other SADPERSONS type stuff)

Poor social supports

4.

Identify reasons for wanting to leave – ie other children, engagements – offer assistance (ie social work)

Offer to find support person (ie partner, friend)

Ensure she understands the seriousness of the situation including your concerns about her mental health and how this may impact her child

Explain the benefits from staying in hospital (allows longer observation of child, interactions (feeding, sleep etc), may allow rest and 'break-the-cycle')

5.

- has a mental health disorder

- no less restrictive means of management

6.

Droperidol 10mg

Midazolam 5-10mg

Others possible as long as safe

Question 8

A 6 month old boy is brought to the emergency department by his mother with 48 hours of vomiting and diarrhoea. He is normally healthy with no significant past medical history. His weight is 8kg.

His vital signs are as follows:

T 36.5°C, HR 140/min, RR 44/min, SpO₂ 96% RA

On examination, he is alert and has a capillary refill time <2 seconds. His eyes are sunken, with slightly dry mucous membranes and decreased skin turgor. His BGL is 4.5mmol/L.

You diagnose him with gastroenteritis.

- i. What is his degree of dehydration? (1 mark)
Moderate dehydration
- ii. Complete the table below. Please demonstrate your working when calculating the rate of administration. (8 marks)

	Nasogastric rehydration	IV rehydration
Indication (2 marks) (only one required)	Failed oral rehydration	Ongoing frequent vomiting of enteral fluids Shock Failure to improve despite oral/NG therapy
Choice of rehydration fluid (2 marks)	Oral rehydration solution (ORS) e.g. Hydralyte, Gastrolyte	0.9% NaCl + 5% Glucose
Rate of administration (ml/kg/hr) and duration of therapy (4 marks)	Rapid rehydration with 100ml/kg over 4 hours (25ml/kg/hr = 8x25 = 200ml/hr for 4 hours)	Rapid rehydration: 10ml/kg/hr (80ml/hr) for 4-6 hours OR Slower rehydration: Maintenance of 4ml/kg/hr (32ml/hr) Deficit = 5% x 8kg x 10 = 400ml over 24 hours approx. 17ml/hr Total 50ml/hr Deficit can be replaced quicker i.e. 8 hours

- iii. List 3 clinical signs that should be monitored during rehydration (3 marks)
Change in weight
Urine output
Clinical signs of dehydration
Ongoing losses
Signs of fluid overload such as puffy face/ extremities

Question 9

1.

Evidence of anaemia with thrombocytopaenia (NOT pancytopaenia)

Most likely cause would be HUS in this clinical setting

2.

Blood film – look for schistocytes to confirm haemolysis

Blood Culture – identify sepsis as cause of HUS ie E coli

Haptoglobin – reduced confirms haemolysis

Chem20 – identify associated uraemia HUS

Bilirubin / LDH – raised in haemolysis

Lots of others – urine for haemoglobinuria

Ultrasound abdomen for splenomegaly (diff includes hypersplenism)

Viral serology for other causes of megakaryocyte stuff (ie parvovirus serology)

Question 10

1

Petechial and **purpuric** rash

Location – face, torso, arms

Comment on child in general – looks pale/sick/unwell

2

Neisseria meningitidis

Strep pneumoniae

Haemophilus influenzae

Staph aureus

3

Drug reaction / SJS

Thrombocytopenia from any cause

Viral eg CMV

DIC any cause eg malignancy

Autoimmune causes – SLE

4

Blood culture – before Abs to guide future Rx

BSL – manage hypoglycaemia common in overwhelming sepsis

VBG – define severity of illness – met acidosis, lactate

5

IV abs – cefotaxime or **ceftriaxone 50mg/kg**, vancomycin 30mg/kg, +/- flucloxacillin +/- gent

IV normal saline 20ml/kg bolus

6

Disseminated intravascular coagulation

7

death

Acute renal failure

Ischaemic hepatitis / brain injury

Amputation limbs

Lots of stuff OK

Question 11 **7/10**

1

Bulging fontanelle

Sick child – with some examination features to support this eg vital signs

Irritable / unconsolable

Apparent neck stiffness

No other source of fever/ no clear focus is acceptable

Seizure but regained consciousness (not focal / ongoing)

(should not mention C/I such as coma, focal signs/focal seizures, skin infection, coagulopathy etc)

2

Organized follow –up within 12-24 hours

Parents sensible

Ability to reattend hospital

Previously healthy

Looks well

WBC – 5-15

Urine clear

CXR clear

CSF clear

Question 12 Answers

Diagnosis	Cardinal Examination Finding
Sepsis	fever
	Focal signs infection eg crackles, cellulitis, fontanelle
Cardiac failure/ congenital heart disease	Heart murmur, hepatomegaly
	Cyanosis not responding to O2
Abdominal catastrophe	Tender abdomen, abdominal distension
	Inguinal hernia
NAI	Multiple bruises, burns
	Retinal haemorrhages
Metabolic	Virilisation, syndromic appearance
	Hyperpigmentation, hepatosplenomegaly

Question 13

Pass mark: 8

A junior doctor approaches you for help regarding a patient. They have just seen an 11 month old girl who was brought in with increased work of breathing and cough. There is a 3 day history of coryzal features, but no other significant medical history. Examination demonstrated an alert interactive child with widespread fine crepitations across both lung fields.

Observation:

HR 155bpm

RR 45r/min

SpO₂ 89% RA

Febrile 37.1

The junior doctor is concerned by the patient's observations and has organised for them to be moved to a resuscitation bay. They have written up orders for an adrenaline neb (5mg), and a salbutamol burst (6 puffs x3) as initial therapy.

1. State the likely diagnosis. (2 mark)

- Bronchiolitis

2. State the immediate management of this patient. (5 marks)

- Cancel orders for adrenaline and salbutamol
- Senior review to confirm diagnosis
- High flow nasal prongs: 2L/Kg, titrate FiO₂ for SpO₂ 94-98%
- NGT placement
- Admission under paediatrics

The child's parents are endocrinologists employed at the hospital and are curious as to what criteria will be used to determine when the child is suitable for discharge.

3. List the criteria for discharge: (5marks)

- SpO₂ consistently >90% (92%)
- Feeding well, and maintaining hydration. (>50%)
- Mild to moderate bronchiolitis
- Good parental understanding
- Ability to return (no isolated, transport restricted)

Question 14

Cause	Cardinal finding
sepsis	Abnormal vitals – fever, tachycardia
Breast milk jaundice	Well child, onset day 3-4
hypothyroidism	Abnormal TFTs
Haematoma breakdown	Large cephalhaematoma from birth
Congenital biliary atresia	Conjugated hyperbilirubinemia, pale urine/dark stools, day 1 jaundice
Haemolysis eg ABO incompatibility	Anaemia, raised LDH, day 1 jaundice

Question 15

i) 3 marks:

1. Call for help – ‘O&G, paed’s’, either/or (**MUST SAY CALL FOR HELP)
2. Place patient in resus bed
3. Urgent assessment of patient (gather information, examination, USS)
4. Analgesia (Judicious)
5. Prepare for delivery - PPE, trolley, resus equipment

ii) 3 marks

Prematurity

- Uterine malformations
- Fibroids
- Polyhydramnios
- Placenta Praevia
- Foetal abnormalities
- Multiple gestations

iii) 2 marks

- Dry the baby - Provides stimulation to the baby to initiate respiratory effort
- Provide warmth to the baby
- Suction the baby’s mouth under direct vision, especially for meconium
- Provide positive pressure ventilation – avoid high concentrations of O₂ if possible
- Commence CPR if HR remains below 60

Equipment Category	CANDIDATE SELECTION (2 marks per box)
Mother and Foetus – delivery	Episiotomy - LA, Scissors, cord clamps
Neonate resuscitation - General	• Firm, horizontal, padded resuscitation surface • Overhead warmer • Light for the area • Clock with timer in seconds • Warmed towels or similar covering • Polyethylene bag or sheet, big enough for a baby less than 1500g birth weight • Stethoscope, neonatal size preferred • Pulse oximeter plus neonatal probe
NEONATAL RESUS A Equipment for airway management	• Suction apparatus and suction catheters (6F, 8F, and either 10F or 12F) • Oropharyngeal airways (sizes 0 and 00) Intubation equipment: - o Laryngoscopes with infant blades (00, 0, 1) - o Spare bulbs, and batteries - o Endotracheal tubes (sizes 2.5, 3, 3.5, and 4 mm ID, uncuffed, no eye) - o Endotracheal stylet or introducer - o Supplies for fixing endotracheal tubes (e.g. scissors, tape) • End-tidal carbon dioxide detector (to confirm intubation) • Meconium suction device (to apply suction directly to endotracheal tube) • Magill forceps, neonatal size (optional) • Laryngeal Mask airway, size 1

NEONATAL RESUS B Equipment for supporting breathing	• Face masks (range of sizes suitable for premature and term infants) • Positive-pressure ventilation device, either: - o T-piece device, or; - o Flow-inflating bag with a pressure safety valve and manometer; and - o Self-inflating bag (approximately 240 ml) with a removable oxygen reservoir • Medical gases: - o Source of medical oxygen (reticulated and/or cylinder, allowing flow rate of up to 10 L/min) with flow meter and tubing - o Source of medical air plus air/oxygen blender • Feeding tubes for gastric decompression (e.g. size 6 & 8F)
NEONATAL RESUS C Equipment for supporting the circulation	• Umbilical venous catheter (UVC) kit (including UVC size 5F) • Peripheral IV cannulation kit • Skin preparation solution suitable for newborn skin • Tapes/devices to secure UVC/IV cannula • Syringes and needles (assorted sizes) • Intraosseous needles
Drugs and fluids	oxytocinon/syntocin IM/IV • Adrenaline (epinephrine): 1:10 000 concentration (0.1 mg/mL) • Volume expanders · Dextrose • Normal saline

Question 16

(i) 5 marks

- MUST say **inconsistent mechanism**
- MUST say **Inconsistent or incomplete history**
- Delayed presentation(s)
- Chronic Disease or Developmental Delay
- Failure to thrive, Age of child VERSUS inappropriate injuries (as in this case Femur#)
- Socioeconomic Status / Blended Family
- Domestic Violence
- Single Parent, Family Dynamics
- Substance Abuse
- Foster Care
- Inappropriate interactions (e.g. child to parent(s))

(ii) 3 marks

- Soft Tissue
 - Any injury in 'non mobile' child of this age is a concern
 - Various Bruises
 - Various Ages
 - Circumferential Injuries
 - Usually NOT over bony prominences
- Burns
 - Cigarette burn
 - Immersion pattern on legs
 - Buttocks
 - Genital Areas
 - Hands
- Head Injury
 - Intracranial haemorrhage(s) - various - e.g. EDH
 - Retinal haemorrhage(s)
- Abdominal
 - Perforated viscus, solid organ injury

(iii) 5 marks

Management

- Two expectations demonstrating consultant level thinking are **MANDATORY REPORTING and DUTY OF CARE** (mom and child cannot leave)
 - ******MUST SAY BOTH FOR 2 OF THE MARKS**
 - Exclude other injuries, full trauma assessment +/- trauma call activation
 - Treat Femoral Fracture - analgesia and consult Orthopaedics
 - Jundicious Documentation and involve Social Worker early
 - Offer / allocate support person to parent
 - **Documentation - concerns (MUST SAY for 1 mark)**, call Child protection (local policy) Duty of care AND Act within the law
 - Open disclosure VERSUS concern for abuse VERSUS need for divulge to parents need of reporting. Other reasonable management.

Question 17

Long question 18 Marks

A 24 day old exclusively breast fed male infant is brought to the emergency department by his concerned mother. Previously presented with jaundice at day 3 not requiring treatment, failed to attend follow up.

Vital signs

HR 122
 BP: 68/42
 RR 26
 Weight 3250g

1. In the table below, outline two (2) maternal risk factors and two (2) neonatal risk factors for clinically significant hyperbilirubinaemia in any neonate (4 marks)

	Risk Factors (any 2 from each)
Maternal	1. Blood group (ABO incompatibility)
	2. Previously jaundiced child
	3. Poorly controlled Diabetes
	4. Family history of inherited haemolytic disorders (e.g. G6PD deficiency, hereditary spherocytosis)
Neonatal	1. Feeding – poor/inadequate supply
	2. Haematological factors such as bruising or polycythaemia or haemolytic disease
	3. Gastrointestinal – bowel obstruction, choledocal cyst, biliary atresia
	4. Other – prematurity, sepsis/infection

2. With regards the case, list 4 features on each of history and examination that will inform your diagnosis and management with justification for each (8 marks)

History	Justification
1. Accompanying symptoms – fever, unsettled	Rule out infection/sepsis as causal
2. Feeding history/weight gain	Rule out inadequate nutrition/hydration as contributor
3. Colour of stools/urine	Look for dark urine and pale/chalky stools. Differentiate conjugated/unconjugated
4. Family history of haemolytic conditions e.g G6PD	Potential etiology
5. Birth history	Prematurity, traumatic birth with cephalohaematoma, blood group as risk factors for jaundice
6. Neonatal screening	Consideration of congenital disorders e.g. hypothyroidism
Exam	
1. Vitals/well or unwell baby	Sepsis/infection
2. Growth parameters	FTT as indication of poor nutrition or underlying chronic disease
3. Dysmorphic features	Consideration of genetic disorders e.g. Alagilles
4. Abdominal masses	Choledocal cyst
5. Hepatosplenomegaly	Metabolic/storage disorder/viral hepatitis

3. Specify 4 initial investigations that should be undertaken – complete the following table (4 marks)

Investigation	Justification
1. Total bilirubin +conjugated bilirubin	Benign vs pathological, pre hepatic, post hepatic
2. FBC	To exclude a structural problem e.g.spherocytosis
3. DAT/Coombs	ABO incompatibility
4. Thyroid function tests	Rule out hypothyroidism
5. Liver function tests	Synthetic function of liver
6. Urine m/c/s	Rule out infection

4. The results of examination and investigations were reassuring for a benign cause. Identify the key elements in discharging this baby safely. (2 mark)

ANSWER: Explanation that this is most likely breast milk jaundice, reassurance, continue with breastfeeding, safety net with regards to development of concerning features including poor feeding, irritability, fever; consider social determinants – neonate – is mother well supported, are there any welfare concerns.

Question 18 (23 marks)

A 2 year old girl is brought to ED by her mother, who tells you her daughter has been reluctant to weight bear. The mother tells you that her daughter pulled a drawer full of cutlery onto her foot yesterday afternoon.

i. Outline four key points of your physical examination of this patient (4 marks)

- Examine entire child for signs of acute or previous injury – undress the child completely – child is pre-verbal, symptoms very imprecise
- Examine foot for signs of injury – skin, bone, soft tissues – look/feel/move
- Examine entire leg for signs of injury – including gait
- Assess the interaction between mother and child – any signs of distress/inappropriate behaviour?
- Approach the child with gentle manner, build rapport and trust
- Be opportunistic – examine in the order the child allows
- Consider small dose of simple analgesia (paracetamol 15mg/kg or ibuprofen 10mg/kg) to allow more detailed examination
- Consider RICE to allow more detailed examination

ii. A femur and knee Xray is performed. Describe your findings (1 mark)

AN XRAY IS SHOWN IN THE PROPS BOOKLET, PAGE 6

- Spiral undisplaced midshaft femur fracture

- iii. Describe three pharmacological options for analgesia in this patient. Provide drug names, doses, dosing intervals, route of administration, and possible adverse effects (9 marks)

NAME	Dose/Route of administration	Adverse effects
Fentanyl	1.5mcg/kg, repeat after 5-10 mins with 0.75-1.5mcg/kg, intranasal	sedation, cardiorespiratory depression, nausea/vomiting, itch, epistaxis
Paracetamol	15mg/kg, 4-6 hourly, oral or IV	hypotension (IV)
Morphine	0.1mg/kg IM, 0.05-0.1mg/kg IV – titrate dose every 5 minutes to visual pain scale/sedation level	sedation, cardiorespiratory depression, nausea/vomiting, itch, allergy
Oxycodone	0.1-0.2mg/kg orally, 4-6 hourly	as per morphine, some patients may not metabolise well and will have reduced effects
Ibuprofen	10mg/kg orally 6-8 hourly	bleeding (anti-platelet effect), GIT irritation, bronchospasm, nephrotoxicity (unlikely in therapeutic dose range)

iv. List five features which might suggest a non-accidental cause of injury in this patient (5 marks)

- Injuries inconsistent with history provided/description of mechanism
- Presence of old/unexplained injuries on thorough physical examination
- Injuries typical of abuse – eg cigarette burns
- Delayed presentation
- Inappropriate interaction between mother and child – mother angry, withdrawn, seems drug-affected etc
- Previous presentations with injuries
- Mechanism of injury not consistent with child's developmental level
- Child has chronic illness/disability

v. The mother decides to discharge the child against medical advice prior to formal splinting and orthopaedic referral. Outline four steps you will take to protect this child (4 marks)

- Talk to the mother yourself, address her concerns, try to convince her to stay for treatment, inform her re her rights and responsibilities to her child
- Assess mother's competence to make decisions
- Notify child-at-risk unit re legal assistance detaining patient in ED
- Excellent and thorough documentation
- Seek assistance from related specialties – eg paediatrics, orthopaedics – try to get urgent involvement
- Notify hospital executive re situation
- Try to involve staff member who has had good rapport with mother involved – eg if she liked the nurse, then get the nurse to do the talking

Question 19

1.

Vital signs – shocked child from any cause esp sepsis, congenital heart problems, urgent resuscitation may be required

Weight, length, head circumference – to plot on growth chart and compare with birth

Fontanelle – raised ICP eg from NAI would have bulging fontanelle

Chest exam – looking for pulmonary oedema or other respiratory dysfunction that would impair feeding

CVS – murmurs / hepatomegaly / coarctation

Jaundice – at this age would indicate serious pathology eg biliary atresia

Bruising – NAI

Many other reasonable answers

2.

BSL – hypoglycaemia in metabolic conditions, sepsis

ECG – tachyarrhythmias can present as failure to thrive

VBG – assess degree of hypoperfusion – eg lactate / metabolic acidosis

Bilirubin / LFTs – esp if jaundiced – exclude congenital liver problem

FBC – anaemia from congenital haemolytic cause

Septic screen – urine / CXR / LP where indicated from examination to exclude infection

Urine for metabolic screen – where suggested by hx or metabolic acidosis

Others OK

Question 20

1.

- target lesions
- erythematous macules
- central sparing
- various sizes
- some confluence right abdomen

2.

Erythema multiforme

3.

Mycoplasma pneumoniae

Viral eg HSV (need specific virus to get the mark)

TB

4.

Antibiotics eg sulphonamides, penicillins

Anticonvulsants eg phenytoin

NSAIDs

Haematological malignancies eg NHL, leukaemias

Physical factors eg cold, radiotherapy

5.

Conservative / symptomatic

Remove trigger

Question 21**1.****None of the following**

- focal features at onset or during the seizure
- Duration of more than 15 minutes
- Recurrence within the same febrile illness
- Incomplete recovery within 1 hour.

2.

Investigation	Justification
No investigation	- Well child, simple febrile convulsion - Clear source of fever on investigation that does not require investigation eg cellulitis - immunised
Urine bag specimen	- all girls <2 yrs - will only exclude UTI, positive specimen requires clean catch
Urine supra-pubic aspiration or catheter specimen	- for those children with positive urine bag specimens or some other Hx to suggest UTI (eg recurrent UTIs)
Blood culture	- for unwell children with suspicion of bacterial illness to direct Ab therapy
Chest x-ray	- only for children with clinical signs of pneumonia - crackles, tachypnoea, decreased O2 sats
Lumbar puncture	- for unwell children with suspicion of meningitis (or unwell with previous Ab Rx) - meningism
Full blood count	- for unwell children - WBC count has some correlation with likelihood of bacterial illness

Question 22

A 12 month old Asian boy is brought to the ED by his parents. Over the last 48 hours his mother noticed him becoming increasingly pale and lethargic and noted his urine was dark. He was seen by his GP 4 days ago with fever, vomiting and cloudy urine which settled with a course of trimethoprim. He is haemodynamically stable and afebrile.

- i. List 4 possible causes of this presentation (4 marks)

- Haemolytic uraemic syndrome
- Haemolytic anaemia – only one mark for haemoglobinopathies
- Infection with dehydration
- Hepatitis / Cholecystitis / porphyria / dengue / malaria / intussusception

He has the following blood results:

WCC	11.8 x10 ⁹ /L	(3.6-11)
Neutrophils	7.3 x 10 ⁹ /L	(1.8-7.5)
Hb	60g/L	(115-165)
Hct	0.29L/L	(0.37-0.44)
Plt	500 x 10 ⁹ /L	(140-400)
RCC	3.5 x 10 ¹² /L	(3.8-5.8)
MCV	90 fL	(80-96)
MCHC	320g/L	(285-300)
Reticulocyte count	240x10 ⁹ /L	(30-140)

DAT / Coombs test – negative

EUC – normal

ii. Describe and interpret the above results (2 marks)

- Normocytic, normochromic severe anaemia, associated reticulocytosis. Coombs negative (non immune mediated)
- Suggestive haemolytic anaemia

iii. List 4 other investigations to help confirm the likely diagnosis and provide your reasoning (8 marks)

- Bilirubin – increased indirect
- Haptoglobins- decreased
- LDH – elevated
- Coags
- U/A and micro – casts = renal, haematuria, urinary haemosiderin (severe haemolysis)
- Blood film – polychromasia – increased RBC production, bite cells – splenic removal hb, Heinz bodies, rule out malaria
- G6PD level – should be taken during well stages so no mark for this

iv. You suspect he has G6PD. List 4 causes of this condition (4 marks)

- Drugs – antimalarials, sulphonamides, cipro, aspirin (one mark only)
- Infections – multiple – (one mark only)
- Napthalene blue (moth balls)
- Fava beans
- Ketoacidosis

v. What would be your treatment for this patient (2 marks)

- Cease trimethoprim
- Admission paediatrics
- Supportive – IV fluids (reduce ketoacidosis / oxidative stress)
- Oral folate
- Does not require blood transfusion – no mark for suggesting this

Question 23

You are a consultant working in a rural emergency department. The local ambulance service alerts you to a critically unwell child being brought to your department. She is a 4 week old girl found by her mother to be grey and floppy. Ambulance states that she is centrally cyanotic, with a capillary refill of 5 seconds.

1. List 4 immediate steps you would take to prepare for arrival.

(2 marks)

Clear resuscitation bay

Ensure department handed over (to another consultant or senior registrar)

Medical ED staff (airway, procedures)

Nursing ED staff (scribe, airway, procedures/drugs)

Paediatric medical staff

+/- anaesthetics or ICU

Paediatric resuscitation trolley

Paediatric guidelines and dosing book (Broselow tape, Monash boo, etc.)

IV and IO

Paediatric airway set up

- 2. On arrival the infant has unrecordable saturations, is mottled, making weak respiratory efforts, and has a capillary return of 5 seconds. The mother reports that the child has congenital heart disease, and is due for surgical repair in the coming weeks.**

Complete the following table on duct dependant congenital heart disease.

(3 marks)

Duct dependant systemic circulation	Coarctation of the aorta Aortic stenosis Mitral atresia Hypoplastic left heart syndrome
Duct dependent pulmonary circulation	Pulmonary atresia Severe pulmonary stenosis Tricuspid atresia

Duct dependant systemic and pulmonary circulation	Transposition of the great vessels
---	------------------------------------

3. List three non-duct dependant forms of congenital heart disease.

(3 marks)

- Truncus arteriosus
- Total anomalous pulmonary venous drainage
- Tetralogy of Fallot
- VSD
- ASD

4. List two other cardiac conditions that may present in the neonatal period.

(2 marks)

- Arrhythmias
- Cardiomyopathy (Hypertrophic, dilated, restrictive)

5. List 2 other causes of neonatal collapse related to endocrine system:

(2 Marks)

Endocrine

- Congenital Adrenal hyperplasia
- Addisonian crises
- Electrolyte disturbance

Question 24 (15 marks)

A 12 year old girl was brought to ED via ambulance following a syncopal episode.

i. What is the definition of syncope (3 marks)

- Abrupt loss of consciousness and postural tone resulting from transient global cerebral hypoperfusion followed by spontaneous complete recovery

ii. What is the most common cause of syncope in children (1 mark)

- Neuro-cardiogenic syncope OR vasovagal syncope

iii. Name a form of syncope unique to the preschool population (1 mark)

- Breath holding spells

iv. List 5 red flags in this girl's history that would prompt further investigation (5 marks)

- Syncope during exercise/supine
- Chest pain prior
- Palpitations prior
- Known structural heart disease
- Family Hx dysrhythmias, sudden death

v. List 5 conditions you would look for in this girl's ECG (5 marks)

- Pre-excitation/WPW
- Long QT
- Short QT
- Brugada
- HOCM
- AV nodal block
- ARVD

Question 25

A 10-day old baby boy is brought into the ED flat and not feeding for 24 hours. He has been vomiting for 12 hours. On examination he has dry mucous membranes, and is only whimpering when bloods are taken. Estimated weight is **4kg**.

A venous blood gas is shown below:

pH:	7.28	
pCO ₂ :	28	mmHg
pO ₂ :	76	mmHg
Na :	128	mmol/L
K:	7.1	mmol/L
Chloride:	88	mmol/L
Bicarb :	13	mmol/L
Base Excess:	-6	
Glucose :	2.2	mmol/L

a) List the three (3) most important blood gas abnormalities (3 marks)

- **Severe hyperkalaemia**
- **Hypoglycaemia**
- Partially compensated metabolic acidosis
- Mild hyponatraemia

b) Other than congenital adrenal hyperplasia, list five (5) differential diagnoses in this child (5 marks)

- 2 ml of clotted blood (serum tube) for analysis of cortisol and 17 hydroxyprogesterone.
- 2ml of blood in EDTA tube for plasma renin activity and ACTH levels - this should be sent on ice to the core lab
- A sample of urine (aim for 5-10ml if possible) for a urinary steroid profile and urinary sodium level

c) You suspect congenital adrenal hyperplasia. List two (2) **SPECIFIC** pathology tests you would request to confirm this diagnosis. (2 marks)

- Dehydration
- Renal failure
- Sepsis
- Malrotation
- Inborn error of metabolism
- Heart failure

d) List three (3) treatments you would initiate in this baby INCLUDING doses (3 marks)

- 10% dextrose 2-5mls/kg
- IV fluids – 10 mls per kilo normal saline
- FIRST LINE Steroids – stress hydrocortisone 25mg initially then 5-10 mg 6 hourly
- OPTION BUT NOT NECESSARY Mineralocorticoid replacement - Fludrocortisone 0.05-0.1 mg daily
- OPTION BUT UNLIKELY TO BE NEEDED 10% calcium gluconate 0.5 mls/kg or insulin 0.1 units/kg/hr with 10% dextrose 5-10mls/kg/h

Question 26

A 3yo boy presents to the ED with wheezing and SOB for 2/7. His mother feels that his symptoms are getting progressively worse. His observations are: RR 40, BP 90/50, HR 150 and Sats 92% RA.

List 6 causes of wheezing in a child and 2 historical features that may support that diagnosis. (6 marks)

Cause of wheezing	2 features on history
<i>asthma</i>	<i>May have family history of asthma</i> <i>Nocturnal cough</i> <i>History atopy</i> <i>History that may be of months or years</i>

<i>Infection eg RSV</i>	<i>Fever</i> <i>Cough, runny nose</i> <i>Other family members sick</i> <i>Acute onset</i>
<i>Inhaled FB</i>	<i>Choking episode</i> <i>Sudden onset</i> <i>Missing toy</i>
<i>Allergic reaction</i>	<i>Associated rash</i> <i>Known allergen exposure</i> <i>Associated angioedema</i>
<i>Cardiac failure</i>	<i>Known cardiac disease</i> <i>SOB with feeding</i> <i>SOB at night or with lying down</i> <i>Ankle/sacral oedema</i> <i>Failure to thrive</i>
<i>reflux</i>	<i>Difficulty with feeding</i> <i>Complains of pain after or during feeding</i> <i>Nocturnal cough</i> <i>Bad breath</i> <i>Early cavities, esp to back teeth</i>

List 3 abnormalities seen on the chest xray (see image)(2 marks)

Collapse of right upper lobe

Consolidation of right upper lobe

Raised right hemidiaphragm

Over the course of his time in ED, RR 50, increased work of breathing, sats 89% on 6L O₂, T37.4 and wheezing only on the right upper side. List 4 management priorities. (2 marks)

Oxygen via HFNP or PEEP

IVF

Trial of bronchodilator

Organise bronchoscopy

What is the most likely diagnosis? (1 mark)

Inhaled foreign body

SAQ 7 image