

Question 16. An 18 month girl presents to the ED with fever and vomiting for the past 36 hours, associated with two loose bowel actions. She is not tolerating any oral intake. Her mother believes that she has caught gastroenteritis from her 3yo brother.

1. List 3 (three) alternative diagnoses which may account for her symptoms (3 marks).

- Metabolic disease - DKA
- Surgical – intussusception, appendicitis, malrotation
- Sepsis – UTI/meningitis/pneumonia

Notes:

- must have an example of a *surgical* and *infective* cause to obtain full marks for this section. It is expected at fellowship level that you consider both these possibilities when assessing any child with these symptoms.
- Most candidates did pretty well
- Not accepted: pyloric stenosis (wrong age range)

2. List 3 (three) features on history that would suggest an alternate diagnosis to acute gastroenteritis (3 marks)

- severe abdominal pain (mild abdo pain/discomfort common with gastro)
- bloody stools
- bilious vomiting
- distress/inconsolable
- pallor with intermittent pain (ie history c/w intussusception)
- symptoms which support alternate source
 - o cough/LRT symptoms, respiratory distress
 - o malodorous urine – paid, but a little dodgy
 (but not altered conscious state – can have this with severe gastro)

Notes:

- overseas travel doesn't make gastro less likely
- previous surgery, prematurity: don't suggest an alternate diagnosis, may slightly change the likelihood of alternate diagnoses but don't suggest an alternate.
- altered conscious state – not discriminatory. Not paid
- be careful not to list examination features. The question asked for features on history

3. List 2 (two) initial therapeutic interventions to treat her symptoms (2 marks)

- Paracetamol 15-20mg/kg
- Ondansetron 2mg (8-15kg)
- Trial of oral rehydration solution

Notes:

- Paracetamol: 10mg/kg: ½ mark. Give a therapeutic dose! – 15mg/kg
- Ondansetron: 4mg - ½ mark, 1mg - ½ mark
- Don't suggest a narcotic (IN fentanyl) if there isn't a history of moderate to severe pain.
- NG rehydration is a more definitive intervention rather than an initial intervention

4. You determine that the child requires rehydration. Based on a determination of 5% dehydration in a 10kg child, complete the following table (6 marks)

	Type of fluid	Volume	Rate
Intravenous rehydration	<ul style="list-style-type: none"> • 0.9%NaCl and 5% glucose • Plasma-Lyte 148 and 5% glucose 	1500mls in 24 hours (500 ml deficit + 1000mls maintenance)	65mls/hr for 24 hours
Rapid nasogastric rehydration	Oral rehydration solution	1000mls (25mls/kg/hr for 4 hours)	250mls/hr for 4 hours

This question was done very poorly. Answers straight from statewide gastroenteritis guidelines. Management of gastroenteritis in children is core emergency medicine. If you don't know what you are doing you can put children at risk. This section sorted out the better candidates. PTO

- **My expectations for IV rehydration:** candidates chose a safe IV fluid, calculated a volume which accounted for losses and maintenance, and propose a safe rehydration timeframe, ideally 24 hours but leeway given (as long as the volume/rate/time added up mathematically!)
- **My expectations for NG rehydration:** candidates choose oral rehydration solution as replacement therapy, a knowledge that rapid NG rehydration is over 4 hours (unless red flags present which would mandate a slower rate, but there were no red flags). I also expected a reasonable stab at the volume required – 25 mls/kg/hr. I was generous with the range, but stopped giving marks when answers for volume and rate were half or double the statewide guideline. (A number of candidates gave 500mls at 125mls/hr for 4 hours. Is there another guideline floating around that you used?)
- Many candidates only gave the intravenous volume to replace the calculated deficit. The question asked what you are going to give to **rehydrate** the child. Replacing a deficit is not rehydration. Over 24 hours the child would fall behind if you only give 500mls. Maintenance must be given as well.
- Too many candidates chose the wrong type of IV fluid (very concerning): 5% glucose is **dangerous** (zero electrolyte replacement!) or plain 0.9% NaCl (without glucose) which is also not acceptable in small children who need calories. 1/2NS and 5% glucose wasn't accepted either. It's not in any guidelines anymore and probably not even stocked in your ED.
- IV fluid bolus unlikely to be required in a 5% dehydrated child, but 10ml/kg accepted reluctantly. Anything greater wasn't – this is a volume you give to a shocked child and the 5% dehydrated child won't be shocked.
- 0.9% NaCl is not an acceptable NG fluid. We just don't do it. (Also, try tasting it)
- Trade names: ½ mark. Don't use trade names ever in written or OSCE exams.
- Remember in a table, Volume = mls, Rate = mls/hr

https://www.rch.org.au/clinicalguide/guideline_index/Gastroenteritis/

5. List 1 (one) advantage and 1 (one) disadvantage for each rehydration option (4 marks)

	advantage	disadvantage
Intravenous rehydration	<ul style="list-style-type: none"> • Best For severe dehydration/signs of shock • Effective if profuse losses or significant abdominal pain • Can give bolus if required 	<ul style="list-style-type: none"> • Invasive • IV complications (extravasation, infection) • Iatrogenic injury – sodium fluxes, incorrect rate or choice of fluid • Potentially difficult to site
Nasogastric rehydration	<ul style="list-style-type: none"> • Safety (less risk of fluid errors, rapid fluxes in electrolytes, Seizure, death) • Decreased hospital LOS • More cost effective 	<ul style="list-style-type: none"> • Complications with insertion of NGT (trauma, pain, endobronchial) • Paralytic ileus • Uncomfortable procedure • Not tolerated by older children. • Not suitable for severe dehydration

Notes:

- can't have same answer for advantage for one modality and disadvantage for the other
- cannula site infections not accepted (too general, we are testing whether you are aware of the pitfalls of IVT in children)
- Can't say that both procedures distressing. Generally the NGT is the more distressing procedure.
- Cant say that 'IV access required' for disadvantages of IV rehydration.
- NG tube if anything, usually helps settle vomiting, not worsen it. However ongoing vomiting accepted as a disadvantage as occasionally you have to slow the rate due to ongoing vomiting, or rarely, bail out and insert an IV
- Can get pathology without IV access (capillary bloods)
- NG rehydration can be as rapid as IV
- 'Titratable' dose of IV fluids as an advantage isn't a great answer. You can change the rate or the volume over time depending of clinical progress, but you can with NG fluids as well.
- NGT does not increase the risk of aspiration

Total Marks =18. Pass mark = 11. Median mark = 10.5. Range: 6-15.5 (considered making the pass mark 10.5 but too many 10.5 candidates dd not safely rehydrate patient in part 4)

If you have any questions relating to this question please feel free to email me: michael.coman@monashhealth.org