

Case 5

You are the Foundation Year 2 doctor at General Hospital.

Bleep number: 3141

GMC number: 11235813

Patient details

Patient name: Abigail Johnson

Date of birth: 12/3/1945

Patient number: 271 828 183

Weight: 67kg

Height: 164cm

History

Abigail presented to the ED via ambulance after being found collapsed at home. Her husband found her in the bathroom. She has a 2-day history of diarrhoea and vomiting and is intermittently conscious.

She has a past medical history of atrial fibrillation and rheumatoid arthritis.

She is currently taking digoxin 125 micrograms OD and has no known drug allergies.

Examination

Respiratory Rate 22

SpO₂: 94%

Heart rate: 112bpm

Blood pressure: 88/54mmHg

Temperature 37.8°C

Responds to voice.

Investigations

Abigail's ECG shows widespread ST depression, T wave flattening and prominent U waves.

Full blood count values were all within the normal range.

Urea and Electrolytes:

Urea	7.4	2.5-6.5
Creatinine	130	62-115
eGFR	34	>90
Na ⁺	125	133-146
K ⁺	2.9	3.5-5
Cl ⁻	94	98-110
Mg ⁺	0.7	0.7-1.0

eGFR 1 month ago: 72

Task

Abigail has already been prescribed a bolus of fluid for resuscitation.

Prescribe maintenance fluids for Abigail for the next 24 hours including, if necessary, any electrolyte replacement.

General Rules of Fluid Maintenance

- 25-30ml/kg/day of fluid
- 1 mmol/kg/day Na⁺, K⁺, Cl⁻
- 50-100g/day glucose (5% glucose contains 5g/100ml) – NB not by weight

“These are the minimum requirements to maintain a patient. If they are deplete or have losses (such as diarrhoea, vomiting), these need to be added on top. If they are hypokalaemic for example, then they will need MORE than 1 mmol/kg/day” - <https://mindthebleep.com/prescribing-iv-fluids/>

From NICE Guidance: (<https://www.nice.org.uk/guidance/cg174/chapter/recommendations#algorithms-for-iv-fluid-therapy>)

For *peripheral intravenous infusion*, the concentration of potassium should not exceed 40 mmol/L.

The rate of infusion of potassium should not exceed 10mmol/hr.

Weight-based potassium prescriptions should be rounded to the nearest common fluids available (for example, a 67 kg person should have fluids containing 20 mmol and 40 mmol of potassium in a 24-hour period). Potassium should not be added to intravenous fluid bags as this is dangerous.

Typically, we are choosing between 5% dextrose (+ any drug additive) and 0.9% sodium chloride (+any drug additive). There is the ‘traditional’ saying of “1 salty and 2 sweet”, but you should calculate the needs of your patient and choose accordingly.

Fluid Maintenance for Our Patient

Our patient is 67kg and requires potassium replacement.

Total fluid requirement is $67 \times (25-30) = 1675-2010 \text{ ml/day}$

67mmol/ day Na⁺, K⁺, Cl⁻

+ extra K⁺

50-100g glucose

- 5% dextrose solution + 40mmol KCl 1L
- 0.9% sodium chloride solution + 40mmol KCl 1L

2L fluid

80mmol of K

154 mmol of Na^+

234 mmol of Cl-

Despite the excess of sodium and chloride, this is a feasible plan for our patient as the most important electrolyte to give the correct amount of is potassium.

Given we have 2 L of fluid to give over the next 24 hours 2000ml/24hr gives us a rate of 83.3ml/hr. In reality, this may be given faster to give the patient time off from infusion.