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.

Intravenous infusion and additive record

Patient's name Abigail Johnson Patient number: 271 828 183

USE CHART FOR 24 HOUR PERIOD ONLY

PRESCRI	Date/Time	1/1/23	12:00		
PRESCRIPTION (All IV fluids to be prescribed generically)	Infusion fluid	0.9% Sodium	Chloride		
ls to be p	Volume	SOOM			
rescribed gene	Drug Additive				
rically)	Rate ml/hr	STAT			
	Doctor's Signature	STAT A Brown			
TO I	Batch no. Expiry date				
TRATIO	Set up by				
Ž	Checked Start/stop by time				
	Start/stop time				

Intravenous infusion and additive record

Patient's name Abigail Johnson Patient number: 271 828 183

USE CHART FOR 24 HOUR PERIOD ONLY

00:30 chloride	1/1/23 0.9% sodium		12:30 solution	1/1/23 5% dextrose	12:00 Chloride	1/1/23 0.9% Sodium		Date/Time Infusion fluid	PRESCRIPTION (All IV fluids to be prescribed generically)
6			,	ctrose	le				(All IV fluid
	1 litre			1 litre		SOOM		Volume	s to be p
potassium chloride	40mmol	chloride	potassium	40mmol				Drug Additive Rate	rescribed gene
	89 53			83.3		STAT	ml/hr	Rate	rically)
	A Brown			A Brown		A Brown	Signature	Doctor's	
							Expiry date	Batch no.	ADMINISTRATION
							by	Set up	TRATIO
							by	Checked	Z
							time	Start/stop	

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 <u>MORE</u> 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*(25-30) = 1675-2010 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.