

Fluid Prescribing

Adapted from MedEd Third Year slides

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What is this question?

Fluid prescribing refers to when patients need additional fluid in order to optimise their health. There are lots of indications for fluid, as there are many instances where patients' fluid needs cannot be met by oral or enteral routes. There are a few different fluids that you can give, and a few different scenarios that call for different fluids.

We'll go through every main scenario and break down the fluids you're giving.

Step 1: Fill out patient details

It's important that you double check this after you've written all this information, and then check once again when you've finished the question.

All the information needed should be given in the question stem, or at the front of question booklet.

Step Two: What do I need to do?

The first step is to figure out whether you are treating a child, or an adult. The next step is going to be to figure out whether you are giving Resuscitation Fluids, or Maintenance Fluids.

This will likely be given in the question, but the differences in indication include:

Resuscitation - if a patient is haemodynamically unstable (very poorly perfused)

Maintenance - if a patient is nil by mouth, poor fluid intake, vomiting, diarrhoea

Step 3: Choosing the Fluid

We will break this down by Adult: Resus and Maintenance, then Child: Resus and Maintenance

Adult Fluid Prescribing

Adult Resus

What are we giving: 0.9% Sodium Chloride (write the entire thing out) How much are we giving: 500 millilitres How quickly are we giving it: Over 15 minutes, there is no rate (best to not write STAT) Drug additive: None

Adult Maintenance

An adult patient requires: 25-30mls of fluid per kilo per day 50-100g of glucose per day 1mmol of Na+/Cl-/K+ per kilo per day

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Let's do a 70kg patient example:

70 x 30 = 2100mls of fluid per 24 hours, essentially 2000mls

We can give this patient 1L bags of each 0.9% Sodium Chloride, and 5% Dextrose. This will cover the *fluid requirement*, the *Na+ and Cl- requirement*, and the *Glucose requirement*.

The last 70mmol of K+ comes from separate Potassium Chloride Additive Bags. These are prescribed in multiples of 20mmol. We can give this 70kg patient 1 bag of 40mmol, and 1 bag of 20mmol in order to give him 60mmol potassium in total (it is better to give a lower amount of potassium due to the risk of hyperkalaemia).

What we are giving: 1 Litre 0.9% Sodium Chloride as bag 1 with a 40mmol Potassium Chloride Drug Additive, 1Litre 5% Dextrose as bag 2 with a 20mmol Potassium Chloride Drug Additive.

How much are we giving: 2000mls total, split across 2 bags How quickly are we giving it: Over 24 hours, so our rate would be 2000/24 which works out to 83ml/hour

Child Fluid Prescribing

It is important to note that children can weight different amounts, so we need to do some more calculations to get a more specific amount of fluid.

Either you will be given the weight of the child in the question, or you can calculate it using the WETFLAG equation:

 $(Age + 4) \times 2 = Estimated Weight$

Child Resus

There is an equation to work out paediatric fluid resus.

10ml Fluid per kg

What are we giving: 0.9% Sodium Chloride How much are we giving: 10ml/kg How quick are we giving it: Over 15 minutes, there is no rate

Child Maintenance

There is another equation for working out paediatric maintenance fluids.

100ml for the first 10kg's of weight 50ml for the second 10kg's of weight 20mls for every kg after this

Adding all these together will give us the total fluid for 24 hours.

There is also an equation for if that child has a *fluid deficit* (this will be identified in the question):

10 x % Dehydration x weight in Kg

If you calculate the fluid deficit, then this can be added to the maintenance fluid.

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Potassium in Paediatric Fluid Prescribing – in paediatric patients you only prescribe potassium chloride additive when a child has "ongoing losses" for example vomiting and diarrhoea. Furthermore, paediatric patients can only be given 20mmol potassium chloride per bag of fluid as an additive (not multiples of 20mmol).

Finally, you can only prescribe paediatric fluids (such as 0.9% sodium chloride) in 500ml bags, not 1L bag as you can do in adults.

So, let's work through an example:

A 7-year-old boy presents with ongoing vomiting. They are reported to be 5% dehydrated. They have been given an initial fluid bolus, please prescribe the maintenance fluids required for the next 24 hours.

So, we are firstly not given a weight, so we must calculate this using WETFLAG.

 $(7+4) \times 2 = 22kg$

Now we can calculate the maintenance fluid:

100ml per the first 10kg's = 1000ml (with 12kg remaining) 50mls per the next 10kgs = 500ml (with 2kg remaining) 20mls per the final 2kg = 40ml So far, we have 1540ml

The next stage is the calculate the dehydration fluids:

10 x 22 x 5 = 1100

So, we now have a running total of 2640ml

We are also told that this child has ongoing losses, so we need to give 20mmol potassium chloride for every bag of fluid.

What are we giving: 0.9% Sodium Chloride + 5% Dextrose (in 500ml bags) + 20mmol Potassium Chloride additive How much are we giving: 2640mls How quick are we giving it: 110mls/hr

At this point it's important for you to go back and check your work.

Additional Information for this question

Adult Fluid:

There are some situations where you give less than a 500ml bolus and you give a 250ml bolus, these include: a patient of 65 years old, frail, heart failure, renal failure. In these instances, you also lower the maintenance amount to 20-25ml/kg/day of fluid.