Fluids in Paediatrics

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Maintenance fluid calculation

		Example weight 48kg
First 10 kg weight	**100ml/kg/d**	10 x 100= 1000ml
Second 10kg	**50ml/kg/d**	10 x 50= 500ml
For every kg above 20kg	**20ml/kg/d**	20 x 28= 560ml
		Total 2060ml/d = 85ml/hour rate

Formula for maintenence fluids

Shock

If features of shock or circulatory collapse:
- Resusicate with fluid bolus 20ml/kg over 10 -15 minutes
- Smaller bolus of 10ml/kg if neonate, heart failure, trauma, raised ICP or DKA

- Always REASSESS response to fluid bolus
- If poor response, repeat bolus (inform seniors)

If fluid bolus >40ml/kg given,
Risk of pulmonary oedema with further fluids, hence
- Call anaesthetist to consider intubation
- Consider use of Inotropes
- Consider Colloids / Blood (if lost in trauma)
- Senior / PICU input required to guide further management

Tips

- Entral route is safest for hydration
- Use IV Fluids for shortest duration
- Choose correct fluids & calculate accurately
- Regular U&E monitoring if prolonged IVT
- Beware of causing hyponatremia
- Restrict to 2/3 maintenance in bronchiolitis, head injury, meningitis or if ventilated

Which Fluid

Resuscitation bolus:
- 0.9%NaCl / Hartmanns / Plasmalyte

Maintenance:
- Usually 0.9%Nacl + 5% Dext
-If prolonged IVT or U&E known, add 0.15% KCl (=20mmol/L)
- If low K, then increase to 0.3%KCl

[0.45%NaCl + 5%Dext is rarely used]

Replacement of losses every 4 hours:
- 0.9%NaCl + 0.15% KCl

Hydration status

- Irritability / Lethargy
- Sunken eyes / Reduced skin turgor
- Tachypnoea / Tachycardia
- Thirst, Reduced urine output
- Dry mucous membranes
- Increased capillary refill time
- Sunken fontanel in infants

Is fluid balance NEGATIVE?
- Vomiting / NGT losses
- Diarrhoea / Stoma output
- Surgical drains
- Is there polyuria?

Example of calculations
26 kg child with 5% dehydration

Maintenance = 1000 + 500 + 120
= 1620ml/ 24 hours = 67 ml/hour

Formula to correct total fluid deficit
= 10 x Weight (kg) x % Dehydration

Deficit = 10 x 26 x 5
= 1300ml over 24 hours = 54 ml/hour

Rate of IVT = 67 + 54 = 121 ml/hour

Note: This is a large amount of fluid, so reassess hydration status, fluid balance & electrolytes in 8 to 12 hours

Ref: Intravenous fluids therapy in children. NICE 2015 (NCG29)