PAEDIATRIC MEDICINE CLINICAL GUIDELINES FOR INTRAVENOUS FLUIDS IN CHILDREN

In the Wards

This set of guidelines is written primarily for fluid orders in the wards, rather than in the OT. However, the principles may be applied in many instances to the OT.

This guideline is applicable to paediatric patients older than 28 days.

Maintenance fluids per day should be calculated using the "100,50,25" rule (also known as the "4,2,1" where the calculation is per hour rather than per day).

100ml/kg/day for the 1st 10kg = 4ml/kg/hr for the 1st 10kg

50ml/kg/day for the 2nd 10kg = 2ml/kg/hr for the 2nd 10kg

25ml/kg/day for every kg thereafter = 1ml/kg/hr for every kg thereafter

Weight (kg)	ml/day	ml/hour	Weight (kg)	ml/day	ml/hour
3	300	12	14	1200	48
4	400	16	16	1300	52
5	500	20	20	1500	60
6	600	24	30	1750	70
7	700	28	40	2000	80
8	800	32	50	2250	90
10	1000	40	60	2500	100
12	1100	44	70	2500	100

There are a number of clinical conditions that will affect the baseline infusion rate:

Consider increasing the infusion rate if:

Fever, hyperventilation, ongoing losses (diarrhoea, polyuria)

Consider decreasing the infusion rate if:

Hypothermia, oliguria, anuria, inactivity, fluid retention, excessive ADH (pneumonia, meningitis)

If the child is dehydrated the water deficit is calculated by multiplying the body weight by the percentage dehydration to obtain the deficit in litres. e.g. 10kg child, 3% dehydration, 10 x 0.03 = 0.3 litres = 300ml deficit.

Fluid deficit in mls:

Dehydration (%)→	*3*	*5*	*10*	*15*
3 kg	90	150	300	450
5 kg	150	250	500	750
10 kg	300	500	1000	1500
15 kg	450	750	1500	2250
20 kg	600	1000	2000	3000
30 kg	900	1500	3000	4500
40 kg	1200	2000	4000	6000
50 kg	1500	2500	5000	7500

The fluid used to rehydrate is the same as the fluid used to provide the maintenance infusion. Rehydration should be carried out evenly over at least 24 hours. If the dehydration is 10% or greater then rehydration should be carried out over a longer period.

e.g. 15 kg child, 5% dehydration

maintenance	1250 ml/day
deficit	750 mls

therefore prescribe 2000mls/day (80mls/hr) for the 1st 24 hours, 1250 mls/day thereafter:

e.g. 30 kg child, 10% dehydration

maintenance	1750 ml/day
deficit	3000 mls

plan to correct the deficit over 48 hours
Therefore prescribe 3250 ml/day (1500+1750) (135 ml/hr) for the 1st 48 hours, followed by maintenance of 1750 ml/day thereafter.

Fluid composition

A. The standard fluids available in the wards are:

Dextrose 5% + 0.45% saline

Dextrose 5% + 0.9% saline (consider for >10kg, or >1 year)

These two preparations will also be available with pre-added KCL to a concentration of 10mmol per 500ml.

B. 0.9% Normal saline can also be prescribed for volume resuscitation in aliquots of 10 to 20ml/kg.

C. Other fluids available are:

Dextrose 5%

Dextrose 10%

Normal Saline 0.9%

Hartmann's and Ringer's Lactate.

Neonatal fluid orders

Neonates (up to 44 weeks post-conceptual age) should have fluids ordered as per table below. Premature or low birth weight babies have a greater surface area to weight ratio, lose more water by evaporation and consequently require more replacement fluid. The fluid is usually given as 10% dextrose with or without NaCl or K added.

Weight / age	< 1.0 kg	1.0 - 1.5 kg	1.5 - 2.0 kg	> 2.0 kg
	Fluid requirement	ml/kg/day		
Day 1	100 - 120	80 - 100	60 - 80	40 - 60
Day 2	120 - 150	110 - 130	90 - 110	60 - 90
Day 3	150 - 170	140 - 160	120 - 140	80 - 100
Day 4	180 - 200	160 - 180	140 - 160	100 - 120
Day 5	180 - 200	170 - 200	150 - 180	120 - 150