Guidelines for IV Fluid and Electrolyte Prescribing in Adults

This document guides fluid and electrolyte management in **medical and surgical ADULT patients** as recommended by NICE[1].

Special circumstances:

- **Frail Elderly or Cardiac Failure**: be cautious giving fluids to frail elderly, or patients with cardiac failure, consult senior for advice
- **Diabetic patients**: use Diabetic Ketoacidosis/Hyperosmolar Hyperglycaemic State protocols as appropriate. Use 0.18%NaCl/4%glucose/KCl with IV insulin.
- **Head injury**: avoid fluids containing glucose
- **Renal and hepatic failure**: consult senior doctor
- **Obstetrics**: consult senior for complex cases
- **Burns**: consult specific guidelines and seek advice

Exclusion:

- Children: consult paediatrician or paediatric resuscitation guidelines

Assess the Patient

Before prescribing fluids, assess your patient's fluid status

Euvolaemic

Extremities are warm, blood pressure and heart rate are normal

Hypovolaemic

Cold extremities, hypotension, tachycardia, oliguria, fluid loss, confusion

Hypervolaemic

Oedematous, inspiratory crackles; raised JVP, poor urine output or fluid overload

Clinical assessment should be accompanied by review of fluid balance charts, NEWS chart and blood results.

Does my patient need IV fluid?

NO: If they are:

- Drinking adequately
- Receiving adequate fluid via NG feed or TPN
- Receiving large volumes with drug infusions

YES: not drinking, has lost or is losing fluid

What type of fluid?

Maintenance

Those unable to meet daily fluid requirement with oral/enteral intake, those fasting for >8 hours

Replacement

Of losses previous or current, record losses and replace later, in addition to maintenance fluids

Resuscitation

Pt is hypovolaemic due to dehydration, blood loss or sepsis. Requires urgent correction of intravascular depletion to correct the deficit.

Maintenance

Suggested maintenance fluid for majority of patients

→ **0.18% sodium chloride/4% glucose with potassium chloride (40mmol in 1000ml)**

This will meet the patient requirements of water, sodium, potassium and glucose.
Excessive volumes of this fluid may cause hyponatraemia

1. Obtain patients **weight in kg**
2. Maintenance fluid requirement is **30ml/kg/24hr**
3. Use table below to choose volume and rate

Reduce to 20-25 ml/kg/24hr in frail elderly or cardiac failure

Weight (kg)	Fluid (ml/day)	Fluid (ml/hr)
35-44	1,200	50
45-54	1,500	65
55-64	1,800	75
65-74	2,100	85
>75	2,400	100 Max)

NEVER GIVE MAINTENANCE FLUIDS AT >100ML/HR

4. Review daily U&Es, additional electrolytes and Hb.

Electrolyte requirements

Sodium	1 mmol/kg/24hrs
Potassium	1 mmol/kg/24hrs (give 40mmol potassium in 1L maintenance fluid)
Glucose	1g/kg/24 hrs to minimise starvation ketosis (1L 4% glucose contains 40g)

IF UNSURE AT ALL CONSULT YOUR SENIOR FOR ADVICE

EXCEPT High potassium (>5mmol/L)

Do not give potassium containing fluids

→ **Give 0.18% sodium chloride/4% glucose**

(Seek senior advice in renal failure)

EXCEPT Hyponatraemia (Na is ≤ 135 mmol/L)

→ **Give PlasmaLyte 148** for maintenance

Monitor U+Es regularly and consult senior

Replacement

Fluid losses are commonly caused by diarrhoea, vomiting, fistulae, drain output, bile leaks or high stoma output. *These should be monitored and recorded on the fluid balance chart.*

Patients may otherwise develop severe metabolic derangement with acidosis or alkalosis and hypokalaemia. **Sicker patients** who require large volumes of fluid over long periods of time may require **additional monitoring**

Calculate replacement fluid requirements

→ **Add up all the losses over the previous 24 hours** from fluid balance chart and **give this volume** as PlasmaLyte 148 **or** 0.9% sodium chloride with potassium chloride

THESE PATIENTS REQUIRE DAILY RE-ASSESSMENT AND REPLACEMENT FLUIDS ARE IN ADDITION TO THE CALCULATED MAINTENANCE REQUIREMENTS

Fluid	Na	K	Cl	Mg	Other
0.18% sodium chloride 4% glucose	30		30		40g glucose
PlasmaLyte 148	140	5	98	1.5	23 gluconate 27 acetate
0.9% sodium chloride	154		154		

Electrolyte and other contents of IV fluids (per litre; unless stated, units in mmol)

Sodium Replacement

Hyponatraemia is common: in the absence of large GI losses the causes are almost always **too much fluid**. Also consider SIADH, or chronic diuretic use.

Refer to Lothian Hyponatraemia guideline

Potassium Replacement

For IV replacement on general adult wards 20mmol of potassium chloride diluted in 500ml 0.9% sodium chloride and given @100ml/hr

The max rate of potassium administration is 10mmol/hr in a ward setting. Patients receiving this do not require cardiac monitoring.

In certain surgical wards and HDU 40mmol of KCL is given in 500ml 0.9%NaCl @125ml/hr

Extravasation of potassium is harmful, ensure the cannula is working well

Resuscitation

For severe dehydration, sepsis or haemorrhage, leading to hypovolaemia and hypotension
→Give PlasmaLyte 148

DO NOT give 0.18%sodium chloride/ 4% glucose or 'speed up' maintenance fluids

Why are they hypotensive?

Exclude **bleeding** and consider **sepsis**

For severe **blood loss** initially use PlasmaLyte 148 until blood and clotting factors arrive. Use O negative blood for torrential bleeding and r*efer to the* ***Major Haemorrhage Protocol***

Severely **septic** patients may need inotropic support in a critical care if they are not responding to fluid. ***If 2 litres of fluid have been given and the patient remains hypotensive seek help urgently.***

Be cautious giving fluid boluses to the frail elderly and cardiac failure and seek senior support in these cases