


Fluids and Electrolyte Replacement

- Normal Saline vs. Lactate Ringers
- Ex. 70 Kg male
- Step 1 Calculate maintenance (at rest)
- First 10 kg = $100\text{cc/kg/d} = 1000\text{cc}$
- Second 10 kg = $50\text{ cc/kg/d} = 500\text{cc}$
- Last Every add. Kg = $20\text{ cc/kg/d} = 1000\text{cc}$
- Total maintenance = $2500\text{cc}/24\text{hours} = 105\text{cc/hr}$

Fluid and Electrolyte

Replacement

- Step 2 Calculate prior losses
- Use acute changes in body weight $1\text{kg}=1\text{L}$
- Use Sx&Sx thirst =5% deficit, tachycardia = 10% deficit, hypotension = 15% deficit.
- Or use difference between normal serum sodium and present serum sodium Ex. $S_{na} = 120$
- First (Diff btw normal and actual)
- $140-120 = 20\text{ meq/L}$
- Second $20\text{ meq/L} \times 42\text{L}$ (total body water) = 840 meq
- Last Divide total meq Na by concentration of replacement fluid $840\text{meq}/ 154\text{meq/L} = 5.5\text{L}$



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- Step 3 Calculate/estimate ongoing losses (Jpeg tube, NG tube, I/O, weight changes, foley bag, ongoing vomiting/diarrhea, estimate insensible losses due to fever, blood loss)
- Add up these totals and replace on an ongoing basis QD

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- Step 4 Replace previous losses and as follows
- $\frac{1}{2}$ Na-Water total losses over first 8 hours then second $\frac{1}{2}$ over 16 hours
- If symptomatic then rapid <24 hour correction is warranted
- If asymptomatic then a slower 48 hour correction is warranted
- Risks of too rapid a correction are Central pontine myelinosis cerebral demyelination with flaccid paralysis and death

Fluid and Electrolyte Replacement

- Step 5 Calculate orders for hourly rate and supplement electrolytes as needed
- Ex. 2500cc/d = maint.
- Add 4000cc = prev. losses
- Add 1000cc/d = ongoing losses
- (Maint. + ongoing) / 24 hours = 146cc/hr NSS
- $4000\text{cc}/2 = 2000\text{cc}$ over 8 hours = 250cc/hr over first hours then 125cc/hr over next 16 hours
- Total hourly rate = 396cc/hr NSS over first 8 hours then 271cc/hr NSS over next 16 hours then 104-146cc/hr NSS depending on continued ongoing losses vs. pure maintenance replacement.

Fluid and Electrolyte Replacement

- Replace electrolytes accordingly
- Every 10 meq KCL IV corrects ~ .1meq serum K
- Mg, Ca, PO4 by trial
- ** Can use same method to estimate how much Na/Fluid someone is ahead and hence needs to come off in hypervolemia i.e. via diuresis. Note time factor may still be applicable but not necessarily.
- Also can use same method to correct symptomatic euvolemic hyponatremia using hypertonic saline. Time factor still applies.

Questions?????????????
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