

FLUID BALANCE

ASCHMC

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INTRODUCTION

- Total body water makes up 60% of body weight in average male, and approximately 50% in average female.
- A 70kg lean adult man has a total body water of about 42 liters, which is 60% of total body weight.)

CONT.....

- The distribution is 66% intracellular, 34% extracellular compartment.
- The extracellular is further subdivided into intravascular 25% (3.5L), and an interstitial 75% (10.5L)

Types of fluids

- **Crystalloid:**
- Fluids are mixtures of sodium chloride and other physiologically active solutes. Sodium is the major component.
- Guidelines on intravenous fluid therapy in adults currently recommend the use of crystalloids that contain sodium in the range 130–154 mmol/l for fluid resuscitation

- Overall, studies suggest that the use of high chloride, unbuffered crystalloid fluid may be associated with major complications following surgery and increased mortality in critically ill patients with sepsis.
- The relative risk of in-hospital mortality was progressively lower among patients who received a greater proportion of balanced fluid, than 0.9 normal saline

Types of fluids

- **Colloids:**
- High molecular weight substances that do not pass rapidly across capillary walls.
- They stay in the vascular space and exert an osmotic force that keeps fluid in the blood vessels.

- The most commonly used colloids are: Albumin, heta starch, and dextran. Blood products are also considered as colloid

Goal of fluid therapy

- Maintain an adequate state of hydration and tissue perfusion with electrolyte balance monitoring
- Observation of vital signs
- Measurement of input output . etc..

Factors to be considered for estimation of fluid requirement

- Maintenance volume- both sensible and insensible
- Fluid deficit – shock, NPO time
- Ongoing loss – bleeding, drainages, any GI loss,
- 3rd space loss- fluid extravasation on the wound side

Table . Fluid requirement calculation

Maintenance (sensible & insensible losses)	4:2:1 principle. Eg for a 50kg patient the 1st 10kg x 4 = 40ml/hr; 2nd 10kg x 2 = 20ml/hr; 3rd and above 30 x 1 = 30ml/hr. total 90ml/hr x 24hrs = 2160ml/24hrs plus insensible loss (300 -- 500ml/24hrs) = 2460-2660ml/24hrs plus For each degree of fever above 37, 2-2.5 ml/kg/day	0-10kg = 100ml/kg/24hrs 11-20kg = 1000ml + 50ml/kg for every kg above 10kg >20kg - 1500ml + 20ml/kg for every kg above 20kg/24hrs Fluid
Fluid deficit	Maintenance/hr x NPO time	
Ongoing loss	For 1ml blood loss 3ml crystalloid, for other losses 1:1	
3rd space	Depends on the size of the	

Infusions in ICU

- **Introduction**
- Most drugs used in critically sick patients admitted to ICU are administered parenterally. Some of these may need to be given only via infusion for various reasons

- Such drugs include vasopressors (eg. Epinephrine, norepinephrine), anesthetic agents, sedatives, antibiotics (eg. Vancomycin) etc.

- What is the reason for administering drugs or fluid via infusion?
- Some drugs are toxic or lethal with bolus administration (eg. KCL and adrenaline)
- Peaks and valleys of effect are decreased with this route of administration achieving steady state(eg shortacting insulin in severe DKA)

- Higher effectiveness is achieved with infusion in some drugs(eg omeprazole infusion has greater acid suppression in UGIB fro PUD).



Precautions:

1. care should be taken before initiating an infusion, and include
2. Is the ordered infusion suitable for peripheral vein or there is need for central line?
3. Is the available peripheral vein canula functioning well?
4. Is the peripheral vein canula size adequate to run an infusion?
5. Is there any infiltration, edema around the infusion site?

6. The dose and concentration of the drug or fluid to be run should be determined by experienced provider.
7. Compatibility and other special characteristics of the insuate should be checked and confirmed before every infusion
8. For infusion of electrolytes, vasopressors, and colloids having new line is ideal
9. Remove any bubbles in the line

After initiation of the infusion

1. Remove any bubbles in the line
2. If the infusion is using infusers, adjust the rate and the dose per minute(mcg/kg/min)or per hour(mostly ml/hour) .This can be calculated and exchanged as needed
3. Watch the site of infusion for extravasations ,swelling or color change
4. Watch your infuser is functioning well and **follow the alarms** and correct accordingly. Infusion should not be discontinued by malfunction

5. Follow the ICU physician order on how, when to escalate or descalate the dose .This is guided by specific patient conditions and drug characteristic.
6. Document your findings V/S on the patient's chart whenever you change the dose
7. Patient should be on continuous monitoring to detect any new developments or side effects.
8. Report to the ICU physician if there is no change, or there is worsening during the infusion therapy.

Discontinuation of running infusion

- Infusion discontinuation is performed either the goal of initiation is attained or when there is marked adverse drug reaction which outweighs the benefit of maintaining the infusion.

Thank you

