Perioperative Fluid Management

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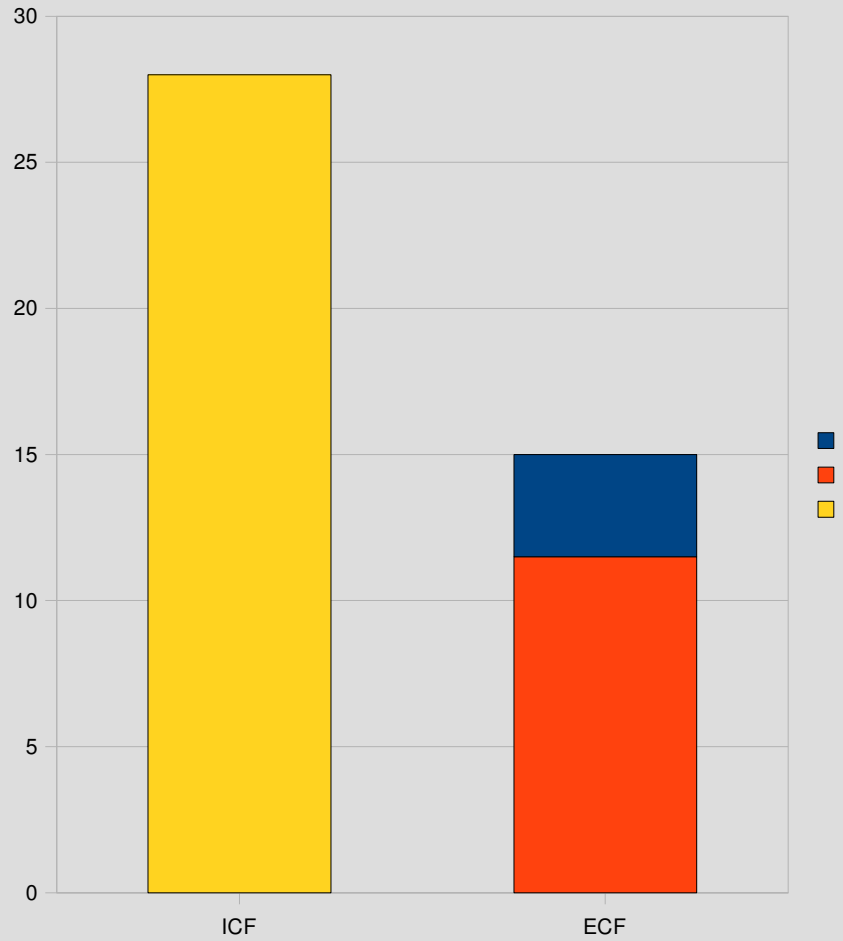
Outline

- Normal Volumes, Compositions
- Normal Requirements (Volume and Electrolytes)
- Monitoring status
- Fluids for use
- Prescriptions
- Problems
  - Low K, High K
  - Low Na, High Na

Normal Volumes

- Total Body Water
- Intra cellular fluid
- Extracellular ECF
  - Interstitial
  - Plasma



Normal Composition

- + = - in ICF and ECF
- ICF about 200
- ECF about 150
- ECF most NB

- + cations
  - Na
  - K
  - Ca
  - Mg
- - anions
  - Cl
  - HCO
  - Protein
  - Anion gap

Normal Volume Requirements

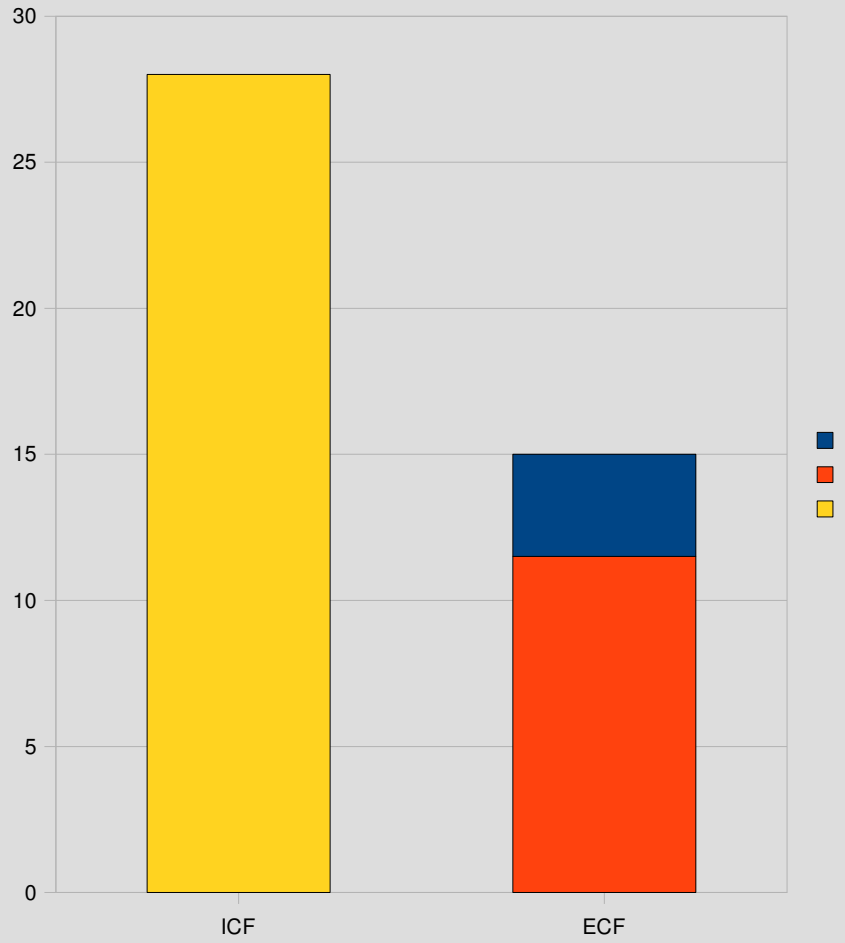
- Holliday Segar Method (ml per hour)
  - 4 mls per Kg for first 10 Kg
  - 2 mls per Kg for next 10 Kg
  - 1 ml per Kg for rest
- Adult 70 Kg
  - 40 + 20 + 50 = 110 mls per hour
- Or 35 mls per Kg per day

Electrolyte requirements

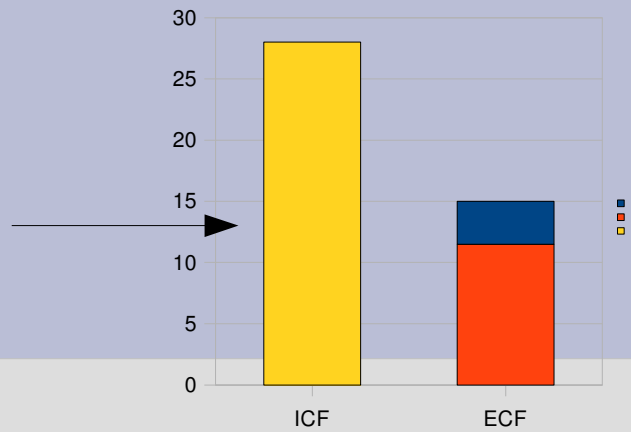
- Na 1-2 mmol per Kg per day
- K 1 mmol per Kg per day

Monitoring Volume Status

- ICF (First space)
- ECF (Second)
  - Interstitium
  - Plasma
    - Forward Component
    - Backward Component
- Third Space
  - Inflammatory etc



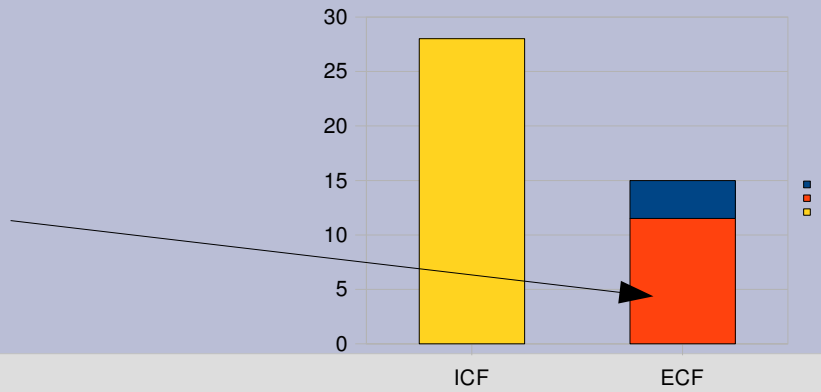
Intracellular Fluid



Brain Headache and Confusion

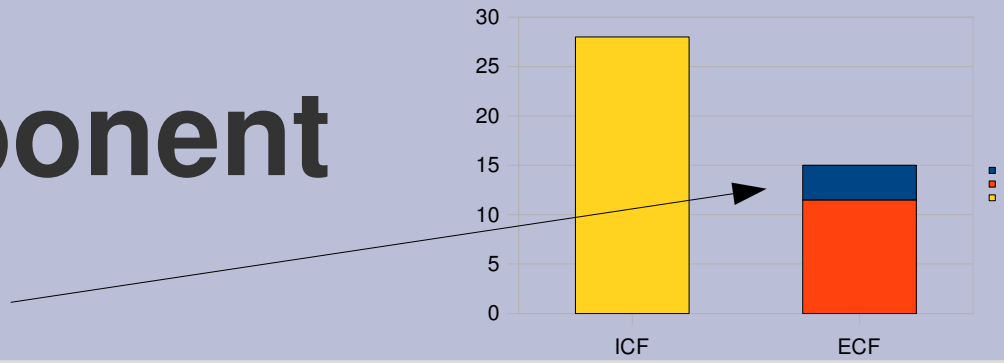
- Decrease
  - ICP low
- Expansion
  - ICP high
  - Herniation through foramen magnum
  - Coneing = RIP

Interstitium



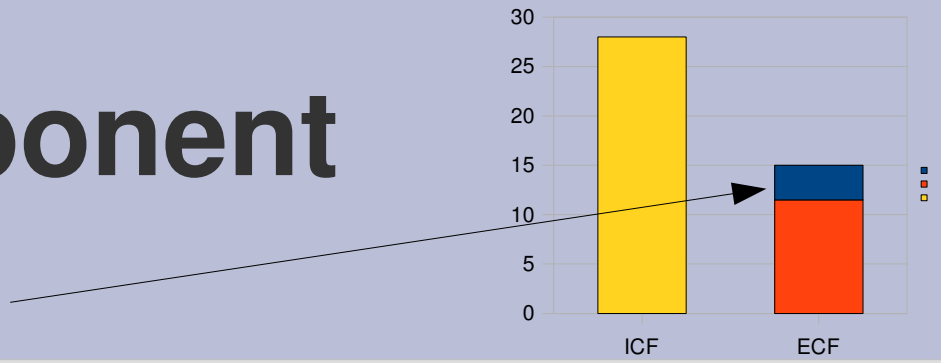
- Decrease
  - Dry membranes
  - Reduced elasticity
  - Low eyeball pressure
- Expansion
  - Oedema

Forward component plasma



- Decrease
  - Tachycardia
  - Hypotension
  - Decreased perfusion (oliguria, lactic acidosis)
  - Sweaty
- Expansion
  - Bradycardia
  - Hypertension

Backward component plasma



- Decrease
  - Low CVP
- Expansion
  - High CVP

Monitoring Status - TBW

Symptom	Percent	Volume
Thirst	3	1.5 L
Dry Mucosae	5	2 L
Low Elasticity	8	3.5 L
Eye ball	10	4.5 L
Tachy/Hypo	15	6.5 L

Monitor Status – Input Output

FLUID BALANCE CHART — **SOUTH INFIRMARY - VICTORIA UNIVERSITY HOSPITAL**

DATE	INTAKE				OUTPUT					
TIME	ORAL	I.V. ERECTED	INFUSED	TOTAL INTAKE	URINE	DRAIN		VOMITUS	G. SUCTION	BOWEL
08.00										
09.00										
10.00										
11.00										
12.00										
13.00										
14.00										
15.00										
16.00										
17.00										
18.00										
19.00										
TOTAL										
20.00										
21.00										
22.00										
23.00										
24.00										
01.00										
02.00										
03.00										
04.00										
05.00										
06.00										
07.00										
TOTAL										

TOTAL INTAKE

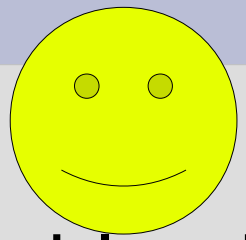
TOTAL OUTPUT

BALANCE

Addressograph

Monitor Status – Bloods

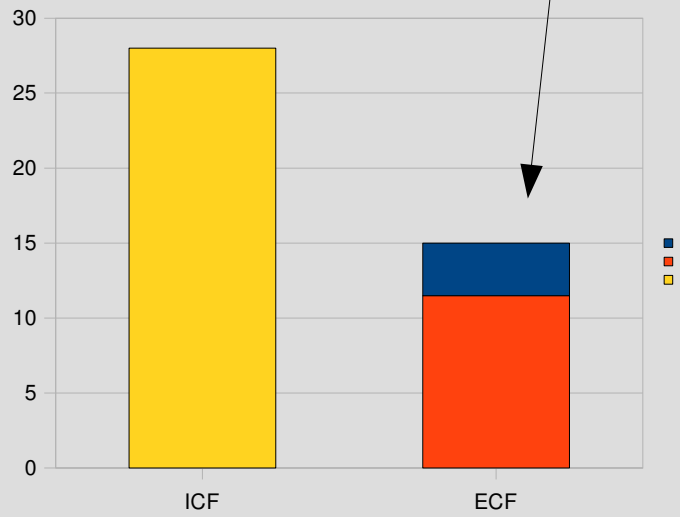
- Urea Creat
- Na
- K
- HCO
- Ca, Mg
- Albumin
- Hb



:- Do not take blood sample for analysis from arm where infusion is running!

Fluids available

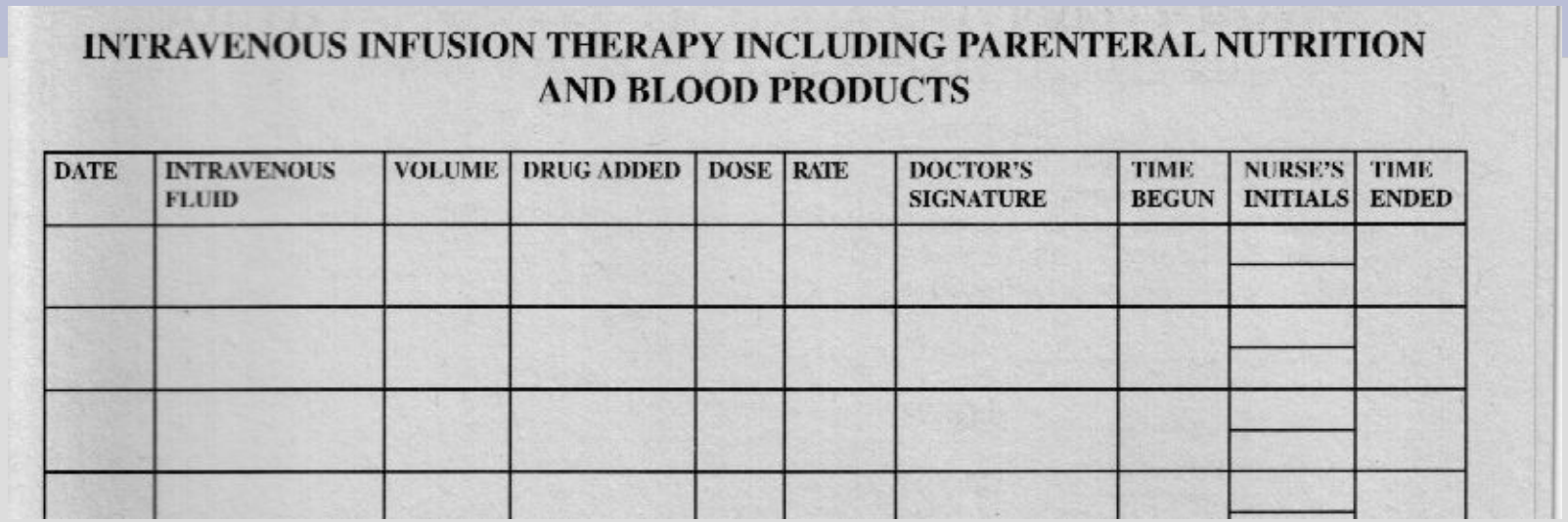
- Crystalloid
  - NaCl
  - D5W
  - Hartmann
  - Soln 0.18
  - Others
- Colloid
  - Blood product
    - Whole blood
    - RBC
    - FFP
    - Albumin
  - Artificial
    - Dextran
    - Gelatin



Read More!

- http://www.surgstudent.org/lectures/flud

Prescriptions



INTRAVENOUS INFUSION THERAPY INCLUDING PARENTERAL NUTRITION AND BLOOD PRODUCTS

DATE	INTRAVENOUS FLUID	VOLUME	DRUG ADDED	DOSE	RATE	DOCTOR'S SIGNATURE	TIME BEGUN	NURSE'S INITIALS	TIME ENDED

- Date 01-Jul-2008
- Fluids, NaCl 0.9%, Dextrose 5%, Soln 0.18
- Volume, 1L (can get 0.5 L bags)
- Drug added KCl Dose 20 mmol
- Rate 8,10,12 hourly or 100 ml per hour

Prescriptions

- Pre op rescusitation
  - Hartmans or NaCl 0.9%
  - 3 component model Maintanance/Deficit/Losses
- Post op for 36-48 hours
  - Hartmans or NaCl 0.9%. No K unless low
- Post op after 48 hours
  - Soln 0.18 with KCl

Potassium in fluids

- None when being transfused or peri injury
- Add in aliquots of 20 mmol (thats the size they come in)
- Max 40 mmol in each 1 L.
  - Take precautions eg buretrol/infusomat
- No bolus of potassium (fatal)

Problems

- Potassium
  - Low
  - High
- Sodium
  - Low
  - High

Why?
What to do?