

Acqua e sale

Aghe (ago) e saal

Mi raccomando, beva molto!

Bruera E et al

Parenteral Hydration in Patients With Advanced Cancer: A Multicenter, Double-Blind, Placebo-Controlled Randomized Trial

JCO January 1, 2013 vol. 31 no. 1 111-118

Hydration at 1 L per day did not improve symptoms, quality of life, or survival compared with placebo

- ...**common**, particularly in hospital patients and elderly people
- ...mild disorders may be **asymptomatic** and self limiting, but severe disorders are associated with considerable **morbidity and mortality**
- ...causes are **often iatrogenic** and therefore avoidable

Whelan B et al.

Serum sodium as a risk factor for in-hospital mortality in acute unselected general medical patients.

QJM. 2009;102:175–82

14,239 emergency medical patients over a 5-year period, mortality was the highest in patients whose Na level was <125 or >140 mmol/L

99

192

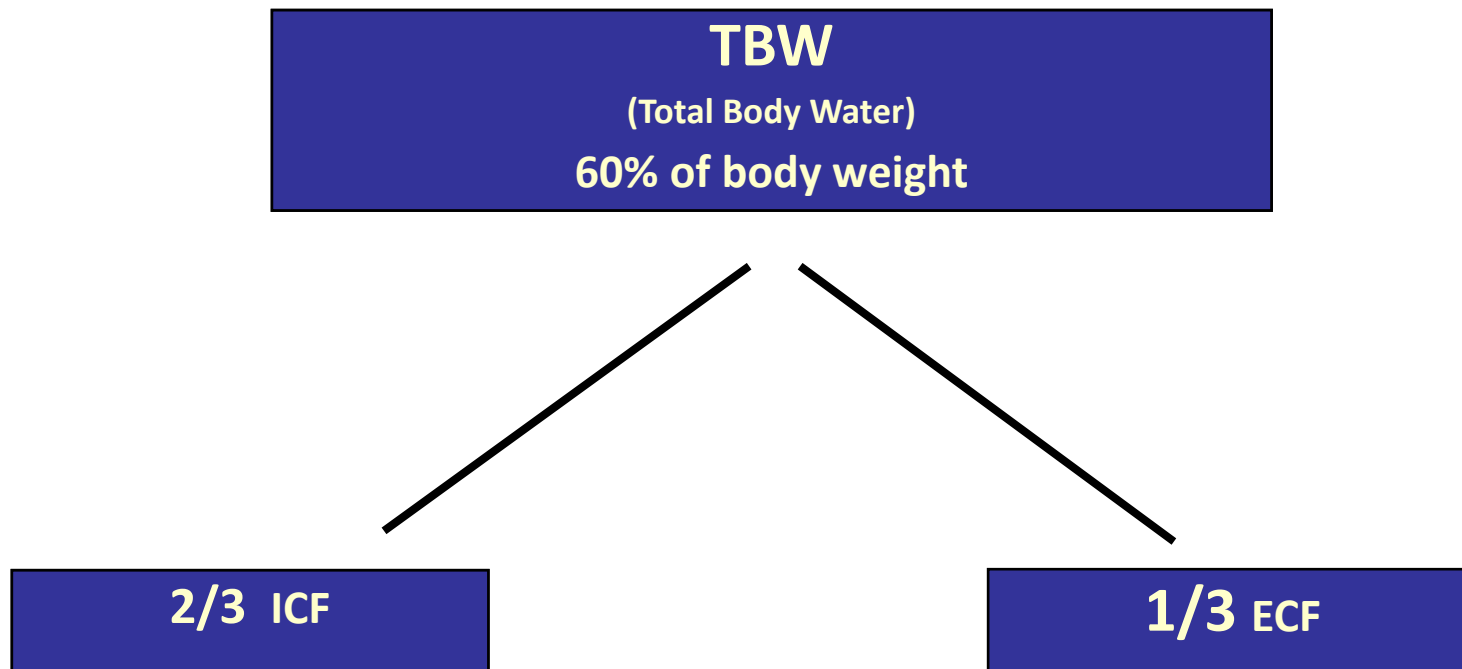
Rodolfo Sbrojavacca

La forma dell'acqua



Sellerio editore Palermo

Water...



Osmolality is a physical property dependent on the total *number of solute particles present in a solution*

Tonicity is a physiological process dependent upon the selectively permeable characteristics of a membrane

$$\text{Posm} = 2 \text{ Na}^+ + \frac{\text{Glucose}}{18} + \frac{\text{BUN}}{2.8}$$

$[\text{Na}]_p$ is the main determinant of plasma osmolality and therefore of the total water balance among the body fluid compartments

RELATIVE PERMEABILITY ACROSS MEMBRANES

Na 1

GLUCOSE 10^4

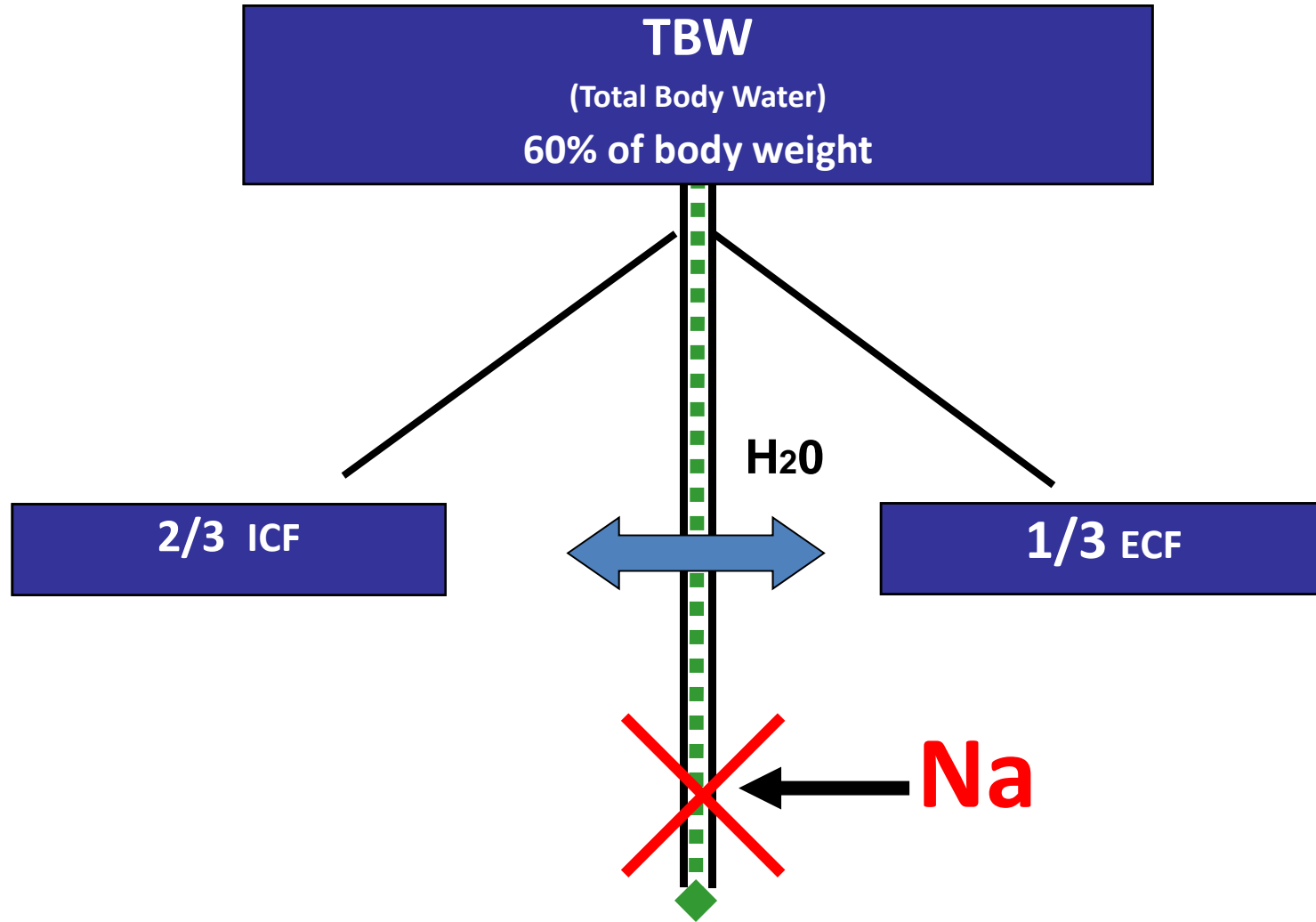
UREA 10^6

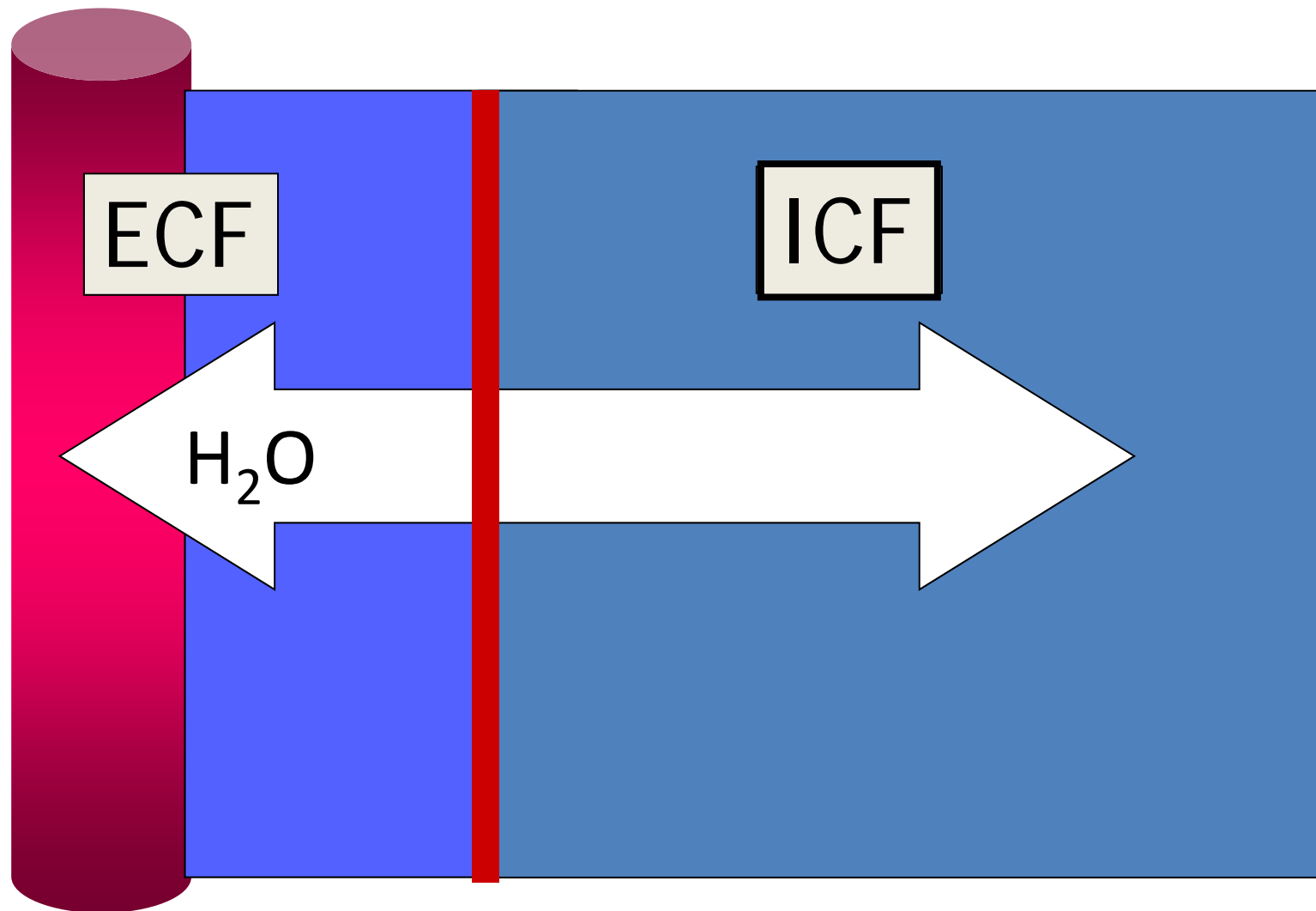
WATER 10^{10}

From the lower to the higher

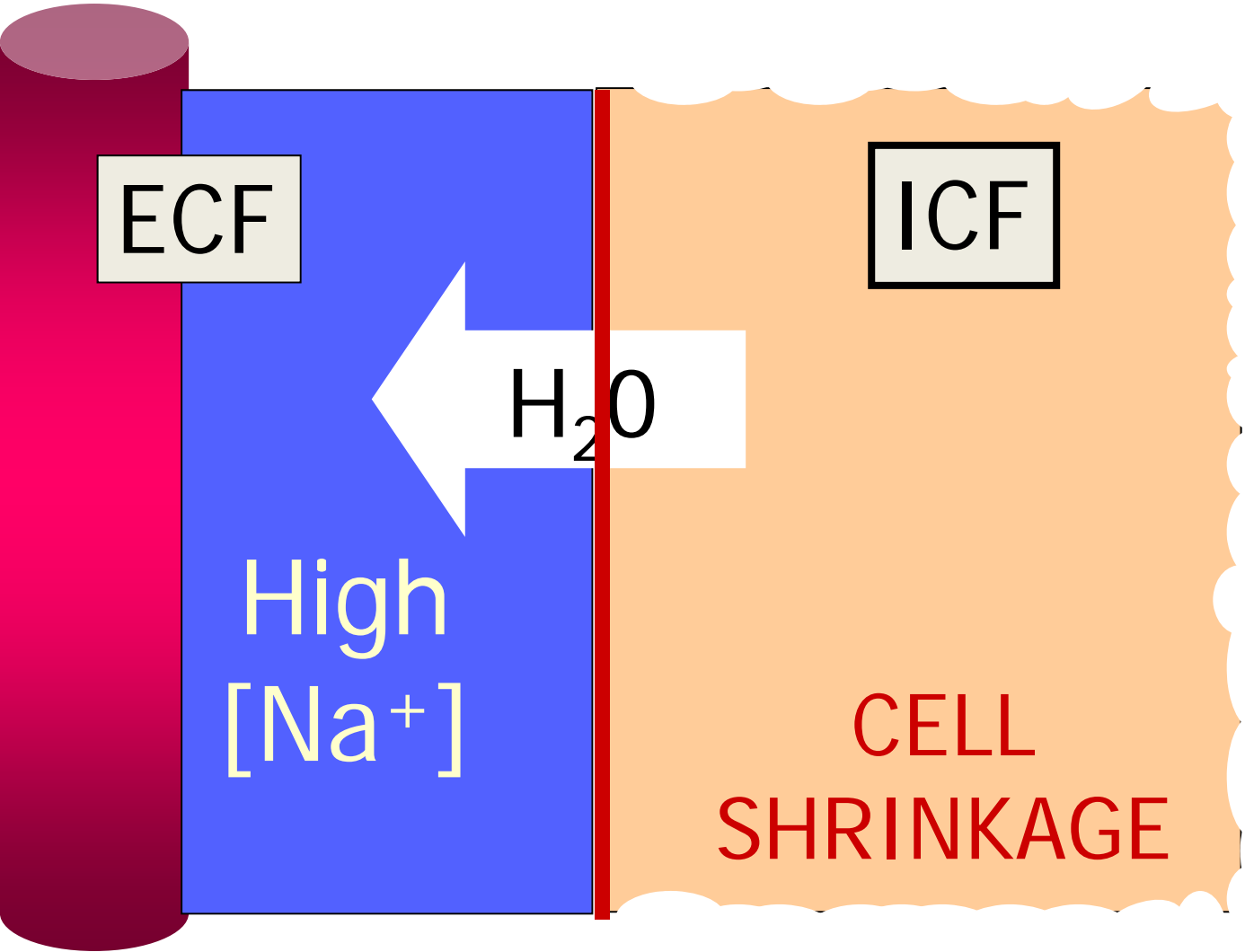
Water moves from solution with the *lower* concentration to the solution with the *higher* concentration: this is

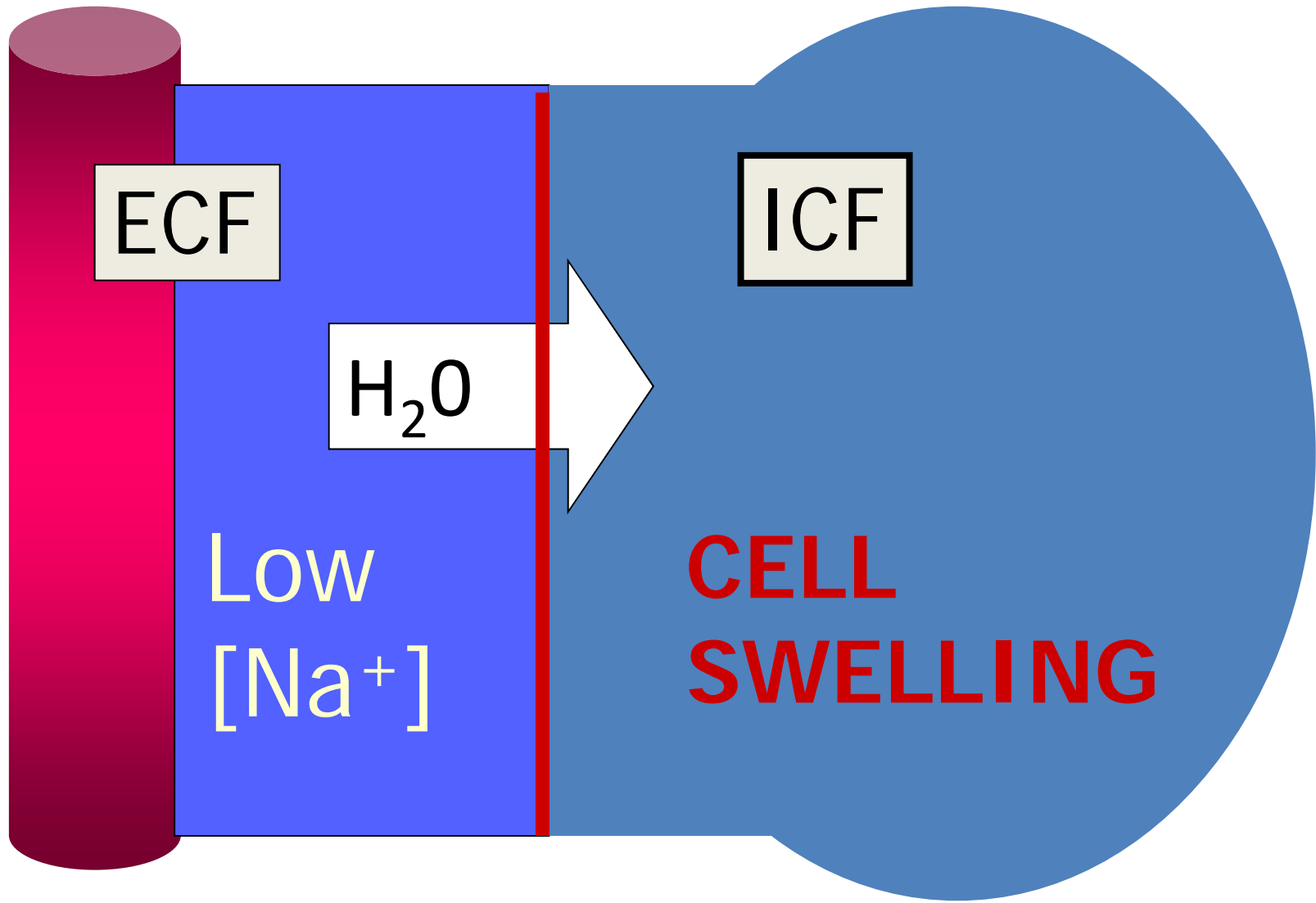
OSMOSIS





ECF Osm \leq $>$ ICF Osm





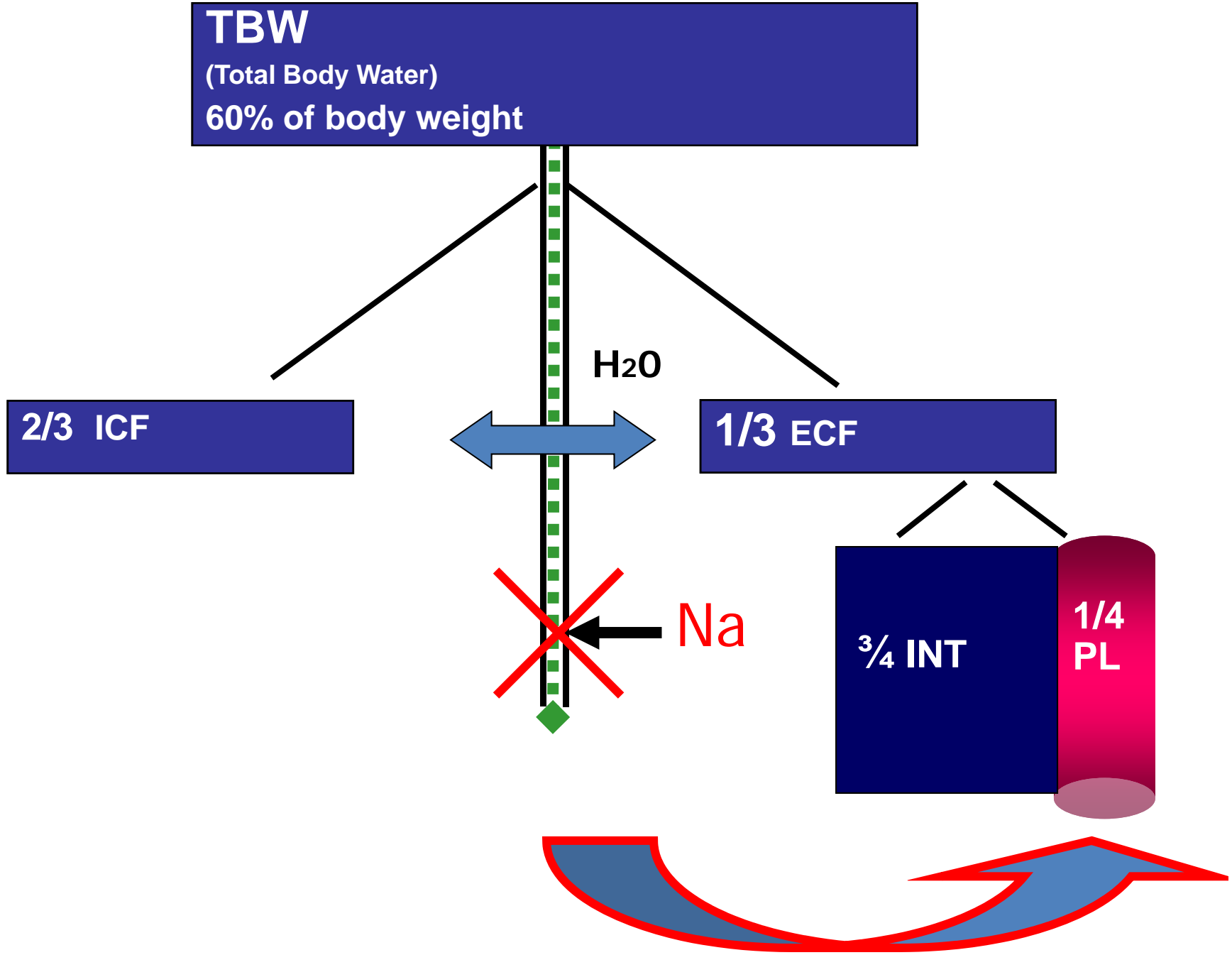
ECF

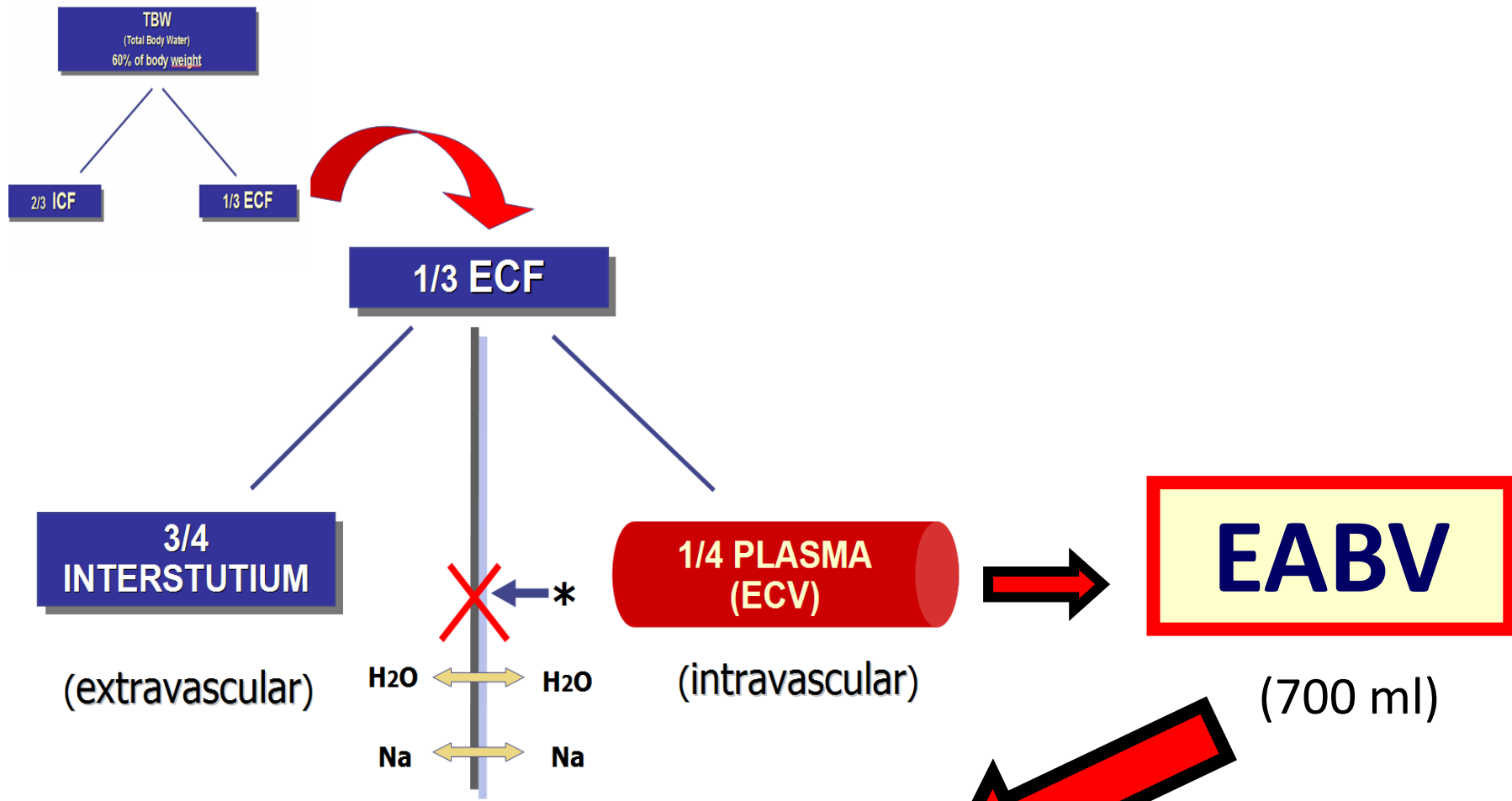
ICF

H₂O

Low
[Na⁺]

**CELL
SWELLING**





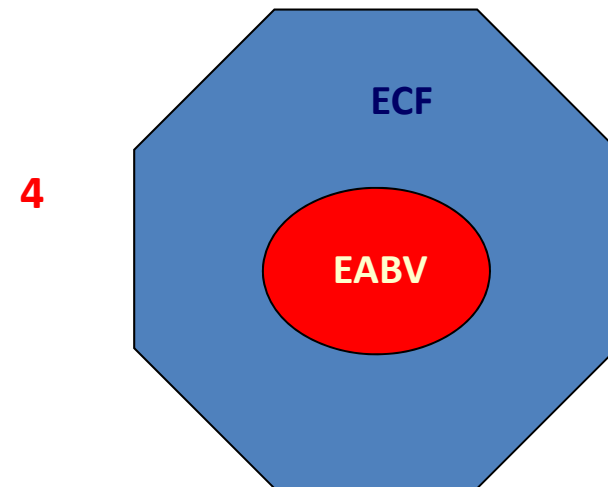
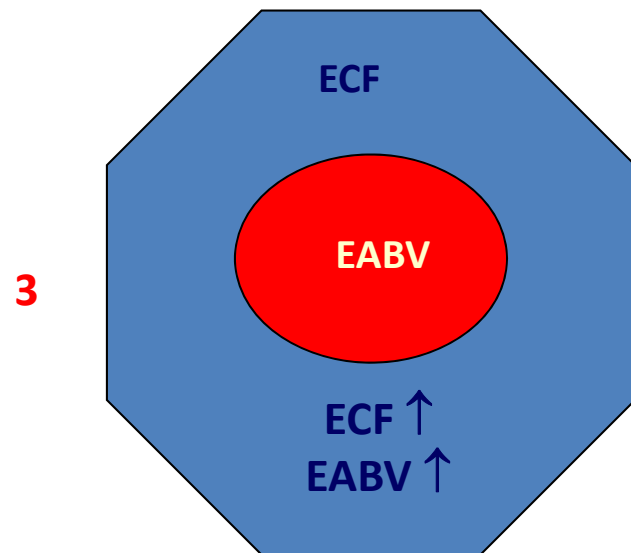
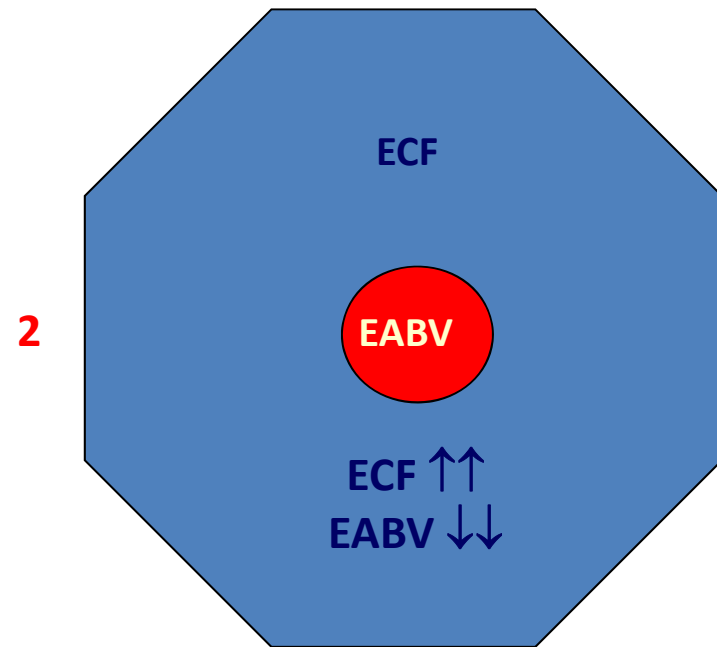
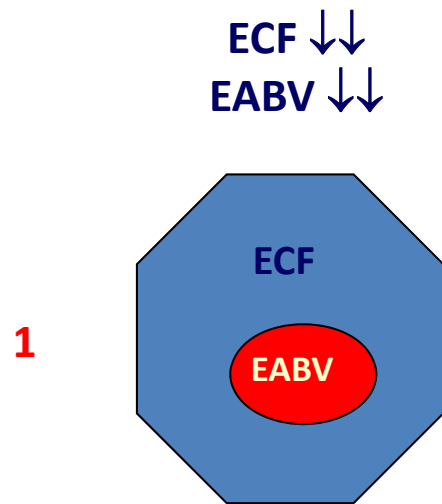
* large molecules

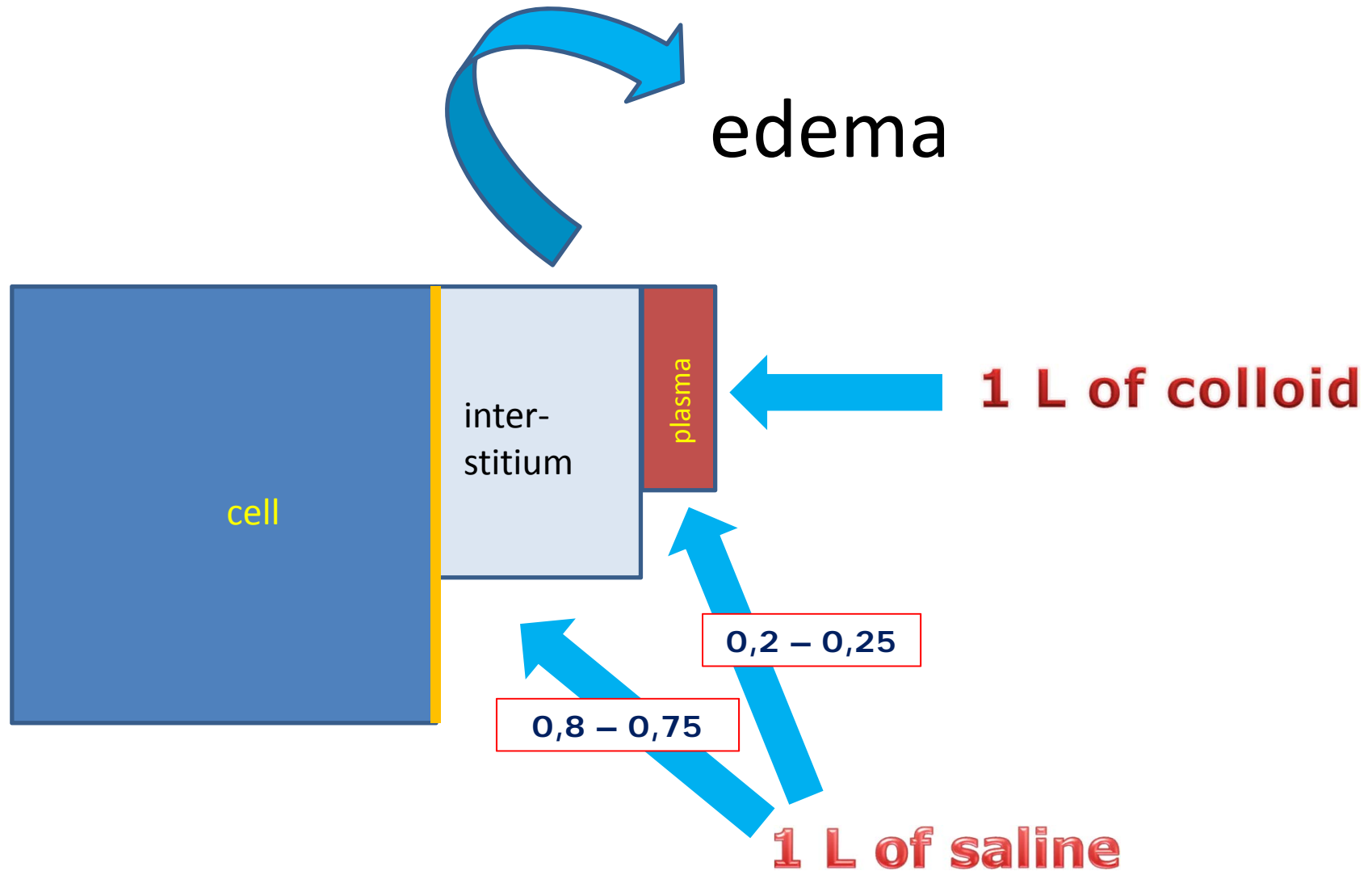
Tissues Perfusion

Evaluate volume status

→ ECF volume

→ EABV





However, this model is
not consistent with the observed effects

Gluc. 5%	0
NaCl 0,45%	77
Ringer	130
NaCl 0,9 %	154

National Clinical Guideline Centre

Intravenous fluid therapy

Intravenous fluid therapy in adults in hospital

Clinical Guideline <CG174>

Methods, evidence and recommendations

December 2013

*Commissioned by the National Institute for
Health and Care Excellence*

GIFTAHo; an improvement on GIFTASuP? New
NICE guidelines on intravenous fluids

Woodcock T Anaesthesia 2014, 69, 399–419

The **pathophysiology of the host response to stress** includes activation of the neurohumoral system that is targeted at conserving both sodium and water through the *renin–angiotensin–aldosterone axis, natriuretic peptides, the sympathetic nervous system and antidiuretic hormone*.

The **amount and type of fluid administered** by clinicians to critically ill patients *affects this acute adaptative response* and , through this, may affect subsequent survival and recovery.

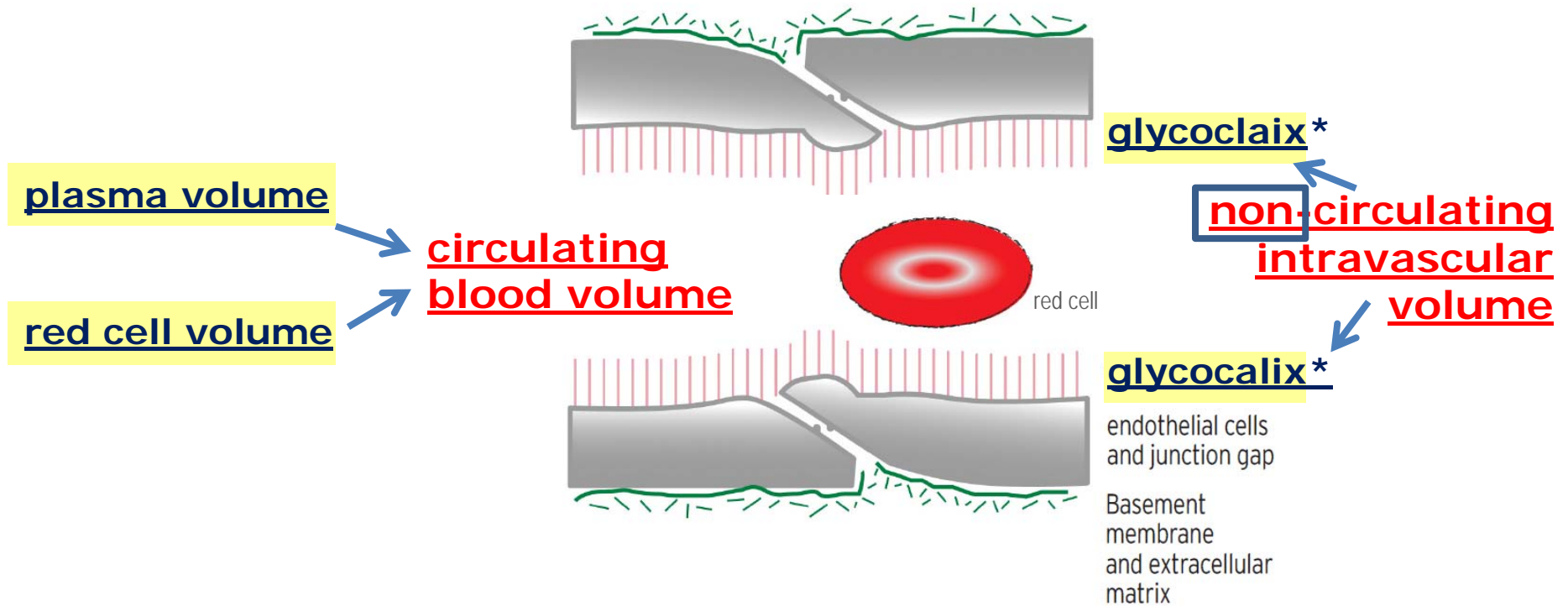
RSE&GM

Bye, bye Starling?

Revised Starling equation (**RSE**) and the glycoocalyx model (**GM**) of transvascular fluid exchange: **an improved paradigm for prescribing intravenous fluid therapy**

There are **three intravascular volumes:**

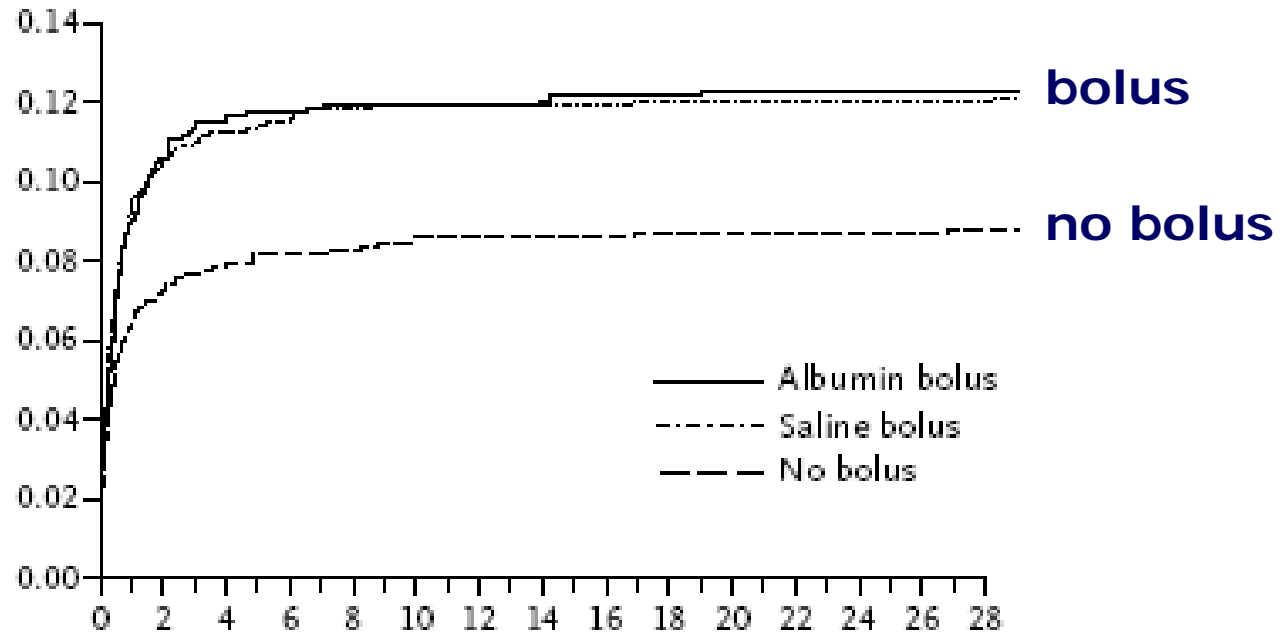
- plasma volume
- red cell volume
- glycocalix



** 1.5 litres of the intravascular volume in health*

Fluid Expansion as Supportive Therapy (FEAST) trial

Maitland K, Kiguli S, Opoka RO, et al.
Mortality after fluid bolus in African children with severe infection
N Engl J Med 2011, 64: 2483-2495.



the trial was stopped after the recruitment of 3141 patients when bolus-fluid resuscitation with albumin or saline was shown to increase the **absolute risk of death** at 48 hours by **3.3 %** and the risk of death, neurologic sequelae, or both at 4 weeks by **4%**.

“Should we just carry on doing what we have always done, which is essentially giving **too much fluid**?”

“Or should we make some effort to be a bit more thoughtful in what we are doing and **reduce the amount of fluid**?”

Finfer S Issue 1 18 March 2014 ISICEM News

To the Executive Director of the European Medicines Agency

We are concerned that the European Medicines Agency's (EMA) Pharmacovigilance Risk Assessment Committee's (PRAC) recent conclusions on the use of hydroxyethyl starch (HES) **will result in harm to patients.**

R. Bellomo

J. Bion*

S. Finfer

J. Myburgh

A. Perner

K. Reinhart

on behalf of all co-signatories

The end of saline solutions?

I think its only real role is in replacing sodium and chloride in patients that are both volume depleted and have a deficit in sodium and chloride.

Lactated Ringer's solution is perfectly reasonable as an alternative, and if clinicians were to make that change, one would expect to see a drop in the rate of AKI and dialysis.

J.Kellum

ATTENZIONE
L'informazione contenuta in questo messaggio è riservata. Se non siete il destinatario del messaggio, è responsabilità del ricevente, a cui si rivolge, la conferma di aver ricevuto il messaggio, e di averne conoscenza. Il messaggio non deve essere divulgato, copiato o ristampato. In caso di necessità, il messaggio deve essere distrutto e non deve essere conservato. Per informazioni, si prega di contattare l'Ufficio di Informazione e Comunicazione - ufficioinformazione@comune.roma7.it

CONSENSUALITÀ
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Humans evolved as long distance persistence hunters on the arid savannahs of south and east Africa.

Because of our evolutionary history, we are **delayed drinkers** and correct the fluid deficits generated by exercise at, for example, the next meal, when the electrolyte (principally sodium but also potassium) deficits are also corrected.

As a result, there is no need to completely replace any fluid deficit as it develops either at rest or during exercise.

Instead people optimise their hydration status by drinking according to the dictates of thirst.

Mythbusters

Dar da bere agli assetati.

Soprattutto quelli che non possono farlo e non possono chiederlo.