First 2011
VIVA 1

Composition of Hartmann's Solution? As this viva developed it sought an understanding of "balanced solutions", difference, adverse effects of intravenous solutions and difference between crystalloids and colloids and distribution of common intravenous solutions within the body. Candidates mostly had difficulty defining and differentiating a colloid from a crystalloid. A colloid is defined as a substance dispersed evenly throughout another substance. The hydrocolloids consist of colloid particles dispersed in water and as such the solid particles may be unable to pass through a semi-permeable membrane, thus exerting a colloid osmotic force and preferentially expanding the intravascular volume.

"What is the composition of hartman's solution?"

Sodium 129, Chloride 109, Lactate 29, Potassium 5, Calcium 2

"What is the definition of a crystalloid?"

is a solution with characterised by a solute that can pass through a semi permiable membrane

"How are 5% dextrose and normal saline redistributed following administration of 1000ml?"

dextrose distributes to the TBW in terms of the ICF:ECF ratio about 5/42 or 120ml IV extra volume
normal saline distributes within the ECF therefore the IV ratio is 3/11 or 250 IV extra volume

"What is the definition of a colloid?"

is a solution characterised by a solute that cannot pass through a semi permiable membrane
they thus exert a colloid osmotic force which will preferentially draw fluid into the intravascular space

"What is the plasma oncotic pressure?"

it is the osmotic pressure exerted by the colloids and is about 25-30 mmHg
it is less than <1% the total osmotic pressure of 5500 mmHg

"What is the Starling Equation?"

this describes the net fitration across a semi permiable membrane
filtration = capillary filtration coeff(hydrostatic pressure difference) + reflection coeff(oncotic press diff)

"What is the reflection coefficient?"

this is a measure of the membrane's permiability to albumin and is usually 0.6-0.9 (glomerulus = 1.0)

"How can you estimate osmolarity?"

osmolarity = 2(Na) + blood glucose + urea

"How do you measure osmolarity?"

via a osmometer which uses the colligative properties of a fluid (freezing or vapour point depression)

"When might you see a difference greater than 10 between estimated or measured?"

when there is contrast medium, alcohols or complex sugars in the bloodstream