APPROACH TO IV FLUIDS IN THE MEDICAL PATIENT

First let’s review the equation for estimating serum osmolality:

\[
\text{Serum osmolality} = 2 \times \text{Na}^+ + \frac{\text{Glucose}}{18} + \frac{\text{BUN}}{2.8}
\]

*See how much more sodium adds to your osmolality than glucose does? That’s why D₅½NS is inappropriate for most medical patients who are hypovolemic. They need isotonic fluids (normal saline). Also, remember that dextrose gets almost immediately metabolized to water and CO₂ when it enters the circulation so it is not osmotically active for too long.*

When considering appropriate IV fluids as you are writing admission order, keep in mind that in general, there are 4 types of medical patients when it comes to administering IV fluids:

1. The hypovolemic patient (most common). Examples include sepsis, pneumonia, intractable nausea/vomiting, etc.
2. The hypervolemic patient (also very common). Examples include CHF, cirrhosis, renal failure, etc.
3. The patient awaiting a procedure (e.g. ERCP).
4. The patient here for an elective reason (expedited work-up of possible malignancy, etc).

Steps to determine appropriate IV fluids for your patient:

**Step 1:** Assess the volume status of your patient and figure out why they’re being admitted to the hospital. Will they be NPO?

**Step 2:** Based on the type of patient they are, write for IV fluids as follows:

**Hypovolemic patient:** fluid of choice is *normal saline*. Your goal here is to volume resuscitate that patient and normal saline is the best choice. Pearl: if you are planning to give more than 3-4 liters of normal saline, switch to plasmalyte or lactated ringer’s (LR) because of the risk of “expansion acidosis”. These fluids are isotonic, just like normal saline.

**Hypervolemic patient:** avoid fluids at all costs.

**Pre-procedure or NPO patient:** treat this patient like a surgical patient if the patient is going to be NPO for longer than 6-12 hours. Administer D₅½ NS at 75-100 cc/hour (don’t have to be too accurate). Don’t give fluids blindly (if the patient is pre-procedure but is old (predisposed to fluid overload because of stiff LV) or has history of CHF, *don’t give fluids!* Pearl: the reason for giving dextrose (D5) is to prevent catabolism.

**Patient healthy, here for elective reason:** no need for fluids if they are taking PO’s.

**Step 3:** Write for a rate for IV fluids:

In medical patients, the rate is somewhat arbitrary and you have to use your judgement. If you are trying to fluid resuscitate that patient, you might be giving fluids “wide open” or 500 cc/hr. If you are just giving fluids to the NPO patient, give fluids at 75-100 cc/hr.