

June, July, Aug, 2011

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Volume 2, Issue 6

Upcoming Events

- Dates are confirmed for the next Austere Medic Course
- Class size is limited to 10 students, so SIGN UP EARLY!!

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Tip: Print and store hard copies of Disaster Medical Preparedness News in case there is a long term power outage. Having the info available on your computer won't help!!

Oral Rehydration

Many illnesses such as Cholera and Dystentary have fluid loss as their primary method of causing harm. It does not take long for a person to dehydrate and die when loosing fluids and electrolytes through diarrhea and/or vomiting.

Survivalists and preppers usually know about and perhaps even stock Oral Rehydration Solution ingredients, but how does one know when enough has been given? How much should a person have to drink a day to maintain their fluid level? What if they have a fever? What if the ambient temperature is high?

Let's start with the basics: The formula for **Oral Rehydration Solution (ORS)** is:

- 1 liter of clean water
- ¾ teaspoon of table salt
- ¼ cup of sugar
- ¼ teaspoon "Salt Substitute" (Potassium Chloride)
- ½ teaspoon of baking soda

Now, let's cover another basic point: *How do we know the victim is dehydrated?* Without laboratory tests, we rely on our assessment of how the person looks.:

MILD DEHYDRATION:

A quick and general rule of thumb is to take a look in the mouth. If the mouth is moist, with plenty of saliva, or if the top of the tongue is

dry but moist underneath the patient is probably mildly dehydrated. The pulse and respiration rate may be above normal. This level of dehydration represents about 3% of body fluid loss.

Signs and Symptoms of dehydration include

- **Thirst**
- **Muscle cramps**
- **Concentrated or no urine**
- **Weakness**
- **Lightheadedness**
- **Heart palpitations**
- **Confusion**

MODERATE DEHYDRATION:

If the tongue is dry above and below, there is moderate to severe dehydration. There may be grooves on the tongue, pulse and respirations may be rapid, and the person may become lightheaded or faint easily, especially going from sitting to standing. This is stage represents roughly 7% body fluid loss.

SEVERE DEHYDRATION:

Usually the person is very lethargic or unconscious, and may even have a fever from dehydration. Skin will be loose, remaining tented when gently pinched. Pulse is very fast and respirations are fast and deep. Urine -if any- will be very dark and concentrated. If the patient is allowed to get to this point, there may be long-term complications (such as kidney failure) or even death. This level represents 10% or more fluid loss.

There are two parts to the process of treating dehydration. Part one is the correction of the fluid loss. Part two is maintaining adequate fluids. The fluid we will be using to treat the patient is half-strength ORS. For every liter of ORS, mix with another liter of clean water.

To correct the fluid loss, use the formula of:

MILD: 30mL fluid per kilogram of patient body weight.

MODERATE: 70mL/Kg

SEVERE: 100mL/kG

This is the amount to be given over 24 hours. It's best if you can have the patient drink 20ml/kg as quickly as practical, then the rest over the 24 hours.

Oral Rehydration Cont.

Here's an example:

Your patient weighs 165 pounds, and he's only mildly dehydrated. To convert to kilograms, simply divide the weight in pounds by 2.2. So the patient is 75kG. We then multiply 75 (the kG) by 30 (mL) to get 2250. That's the number of milliliters (mL) we need to give the patient over 24 hours to correct the dehydration. 2.25 liters.

As mentioned, it's best if the patient can drink 20mL/kG as quickly as tolerated. In this case 20mL times 75kG is 1500ml or 1.5 liters.

So ideally we should give 1.5 liters now, 750mL later over the rest of 24 hours.

But wait! The very act of living uses water. This must be accounted for, as well! Imagine the patient is a leaky 5 gallon bucket. We've just figured out how many gallons to fill it, but we need to take the leak into account as well, and add a bit extra for that, too.

To figure the patient's maintenance amount, you need to use the following formula:

- For the first 10kG of body weight, give 100mL/kG
- For the second kG, give 50mL/kG
- For the remaining weight, give 20mL/kG.

So to use the same 75kG patient above;

- the first 10kG is 100mL/kG = 1000mL
- Second 10kG is 50ml/kG = 500mL
- Remaining 55kG (75 -10 -10 = 55) at 20mL/kG
= 1100mL
Total: = 2600mL/day

Admittedly, that can be a lot of arithmetic. And it's not over yet, though we're in the home stretch. There needs to be a modifier for conditions in which the patient is using more than the "normal" amount of fluids. The two big ones are increased ambient temperature and fever. If the patient has a fever of 102°F or above, add 1/3 to the amount of maintenance fluid. If the ambient temperature is 90°F or higher, add another 1/3.

So on Day 1, we add the rehydration amount of 2250mL with the maintenance amount of 2600mL, and get the total amount of 4850mL over 24 hours. If you divide this by 16 (the

number of hours the patient is awake in a day, more or less) you get about 303mL per hour. A soft drink can holds 355mL, for reference. So it's not as bad as it sounds to drink that much in a day.

According to Rehydrate.org, over 2.2 million people will die of dehydration caused by diarrhea causing illnesses this year.

Now on to Day 2! Let us say that the patient was not able to drink all 4850mL on Day 1. You need to roll that leftover amount over into Day 2. Additionally, the same amount of maintenance fluid (2600mL in this example) we figured for Day 1 will need to be given on Day 3, Day 4, etc. Finally, we need to replace losses due to diarrhea and vomiting. If possible, a measurement of these amounts will make the calculation more accurate than an estimation.

Here is the "Cliff Notes" version:

REHYDRATION:

Mild:	30mL/kG
Moderate:	70mL/kG
Severe:	100mL/kG (20mL/kG quickly, rest over 24 hours)

MAINTENANCE:

1 st 10kG:	100mL/kG
2 nd 10kG:	50mL/kG
Remainder:	20mL/kG

Oral Rehydration Cont.

- Ambient temp. 90°F and above, add 1/3 of Maintenance volume
- Fever 102°F and above, add 1/3 of Maintenance volume
- Fever AND >90°F ambient add 2/3 of Maintenance volume

SCHEDULE:

Day 1: Rehydration volume + Maintenance Volume

Day 2: Maintenance + Leftover + Loss

Days 3+: Maintenance + Leftover + Loss

FINAL NOTES:

The largest impediment to rehydrating the dehydrated patient with ORS is nausea. Quite often this is a side effect of the dehydration itself, and forms a vicious circle: Dehydration leads to nausea, which leads to inadequate fluid intake, which leads to more dehydration, more nausea, less fluid intake, etc.

The Austere Medic should hand the nauseous patient a teaspoon instead of a full glass of water! Many times, when the nauseous patient tries to drink a glass of water, it all comes back up. It can also be difficult to convince the nauseous patient to TRY to drink a glass of water. If, on the other hand, you ask the patient to drink a teaspoon a minute, the patient will often tolerate this much better.

Prescription “Zofran” (ondanestron) is a powerful anti-nausea medication first developed for chemotherapy patients. It has since come “off patent” making generic formulations available at a lower cost. It is available in “melt away” tablets which dissolve in the mouth. This medication has very few side effects, mostly a

Although we tend to think of the summer's heat as the main culprit, dehydration can occur even in winter. The air is drier, and the body must work harder to warm and humidify the incoming dry air. As well, we don't seem psychologically inclined to remember to drink fluids often during cold-weather outdoor activities.

slight drowsiness. Your family physician may prescribe these if you are going on a ocean cruise or deep sea fishing. This medication may alleviate the patient's nausea enough so fluid intake is no longer problematic.

If the patient cannot or will not drink a nasogastric tube can be a solution. This thin tube is passed from the nose, into the back of the throat, and swallowed. The insertion process is only mildly unpleasant for the patient, and brief. After that, fluids can be given even in a sleeping (but not unconscious) patient.

In a severely dehydrated patient who is unconscious, the Austere Medic's choices are limited to IV infusion, hypodermoclysis (both techniques are taught by Midwest Disaster Medical) or interosseous infusion.

Especially in dehydration, an ounce of prevention is worth a pound of cure. Prompt recognition and treatment of mild dehydration will prevent

difficult treatment and a poor patient outcome later.