Common Causes of Decreased Brain Function: STOP-EATS

By: Clifton Castleman, WEMT

After a three hour nap along the Appalachian Trail, it's time to wake your friend Sam to start heading out again so that you both can make camp before nightfall. He doesn't answer your shouts from a few feet away. Now what? You find him asleep in the in his tent, fly zipped up. Maybe he didn't hear you, or maybe he's just really tired. But in spite your vigorous attempts to arouse him, Sam makes only a half-hearted attempt to open his eyes and nothing intelligible in the way of a verbal response. He may not always be the brightest crayon in the box, but this is definitely abnormal! Something is wrong with Sam's brain.

The brain is exquisitely sensitive to oxygen deprivation, metabolic derangement, and toxins. Changes in brain function are often the first clue to an evolving systemic problem. Mental status changes are early symptoms. A person may be awake but irritable, confused, and complacent as is seen in early mild hypothermia. Or, a person may exhibit reduced inhibitions and jovial behavior, as often develops on the third or fourth long island iced tea.

As more serious problems develop, a person's level of responsiveness changes. We describe this as being "V", "P", or "U" on the AVPU scale: A = alert & oriented, V = responsive to verbal stimuli, P = responsive to painful stimuli, and U = completely unresponsive. It appears that Sam is "V" on the AVPU scale and you have no idea what could be wrong with him.

Since you're out on the trail, you don't have access to the luxuries of a hospital or even thoroughly equipped first aid kid, and you don't have much in the way of lab tests and instruments to evaluate your friend-turned-patient. You do, however, remember some of your training from Wilderness First Responder.

Yes… there was a clever mnemonic to help sort out what might be wrong when somebody's brain is not working the way it should. "STOP-EATS" covers the generic problems associated with changes in brain function.

S = *Sugar*
Low blood sugar in diabetics can cause mental status changes and even loss of consciousness. But, you've known this guy for years and he's not a diabetic. Besides, he just ate a hearty lunch three hours ago.

T = *Temperature*
Hypothermia and heat stroke both result in mental status changes and sometimes loss of consciousness when severe. A quick exam determines that his skin appears to be "unremarkable"(normal). This can't be a temperature problem.

O = *Oxygen*
There's nothing to indicate he's been asphyxiated or has drowned. His skin color is very pink, not blue as you might expect with asphyxia. This is probably not an oxygen-related problem.

P = *Pressure*
This refers to elevated intracranial pressure (ICP) from brain swelling that can develop after a traumatic brain injury (TBI) such as a concussion, etc. As far as you know, there's been no trauma. You eliminate pressure as a factor.

E = *Electricity*
This refers to amount electrical activities that can disrupt the way your body normally functions. A very common examples would be a stroke, where electrical pulses in the brain may be disrupted. A stroke normally affects just one side of the body; which Sam doesn't seem to be exhibiting.

A = *Altitude*
You're only at 1000 feet and have been hiking at that altitude for about three days now. Plus, altitude sickness doesn't usually happen under 8000 feet elevation. Another possibility crossed off.

T = *Toxins*
How about toxins? Could he have taken something or been poisoned? A quick look around the tent reveals no pill bottles or Smirnoff empties. He's not the kind of guy that would do that, anyway. But, can't rule it out yet. Toxins remain possible.

S = *Salts*
This refers to amount of salts in the body that can become too diluted when a person drinks way too much water and doesn't eat enough food; or if they are dehydrated and have not been drinking enough water. Not Sam; he certainly eats plenty and has been drinking lots of water.

That leaves toxins. All other possibilities have been eliminated. What about the air? It does smell in here. Suddenly it becomes obvious. He's been using his pack as a pillow and you realize that it appears wet all around his head. The fuel bottle is leaking inside his pack! Carbon monoxide! That explains Sam's nice pink skin and the headache you've developed since you came to check on him. You haul him out of the tent into the fresh air and call for help. Another life saved by a simple mnemonic!