



Jenny is suffering from heat exhaustion that is exacerbated by her sunburn. Ultra violet radiation damages skin cells and stimulates an inflammatory response that causes local vasodilation and permeability changes in the microvascular bed; this, in turn, causes plasma (water) to shift from the blood vessels into the damaged tissue. These changes result in the redness, pain, and swelling typically associated with sunburn. The fluid shift exacerbates her dehydration and therefore her heat exhaustion (heat exhaustion can be defined as dehydration in a significant heat challenge). While the night is warm, it is still cooler than normal body temperature. Because inflammation from her sunburn prevents her from constricting her peripheral blood vessels, she is unable to thermoregulate; hence, the shivering. The vomiting is a result of her dehydration, probably combined with sodium depletion. Her "fever" results from a combination of the earlier heat challenge and her shivering (which although counter productive is pretty darn effective at producing heat).

She needs assistance with her thermoregulation. Add clothing until she is no longer shivering and remove layers if she becomes too warm. While she is awake, give her cool water mixed with oral rehydration salts at a one liter per hour to replace lost fluids and electrolytes until her urine is clear or pale yellow; this may take a day or two. Keep her out of the sun during treatment. As her sunburn heals the plasma will gradually shift back into the vessels and it will be easier to keep her hydrated. When she is feeling normal, she may continue with your trip...but take it easy for another week or so to permit her to acclimate to the desert heat. Consider resting in a cool spot during the hottest part of the day and exercising in the early morning and at night when it's cooler. Get some light colored commercial sun block clothing and have her use a waterproof zinc oxide-based sun block on any exposed skin.