

# HEAT EXCHANGE

The body cools mainly by **evaporation, convection, and radiation.**

**Evaporation** of sweat works best in dry heat, diminishing with rising humidity.

Humid environments inhibit evaporation of sweat, diminish cooling, and create heat rashes.

**Convection** of heat works when the air temperature is lower than body temperature, and when there is air movement. When it is very hot, with no air movement, little cooling takes place through convection.

Fans cool partially by convection, and partly by evaporation. In humid environments, most of the cooling effect felt from moving air is because of convection.

**Radiation** depends on the difference in temperature between the body and surrounding surfaces. Air temperature, air movement, and humidity have little effect. It is the “normal” method of heat exchange, and except for the very hottest days, 40-60% of body heat loss is through normal radiation of heat.

Especially when working outdoors, radiation is usually your enemy in the summer, you absorb more heat than you radiate. (“Sunstroke”)

**AIR CONDITIONING**--Feels so good when you’re hot, because it enhances all 3 methods of heat exchange--

Dehumidified, dry air from air conditioning is ideal for evaporation of sweat to occur.

Cool air from air conditioning enhances convection of heat from the surface of the skin. Breezes felt from moving, conditioned air are a “bonus.”

Air conditioning cools objects in a room, allowing them to receive the heat our bodies radiate.