



Warm Weather Alert - Fighting Heat Stress

Heat stress is an increase in human body temperature and metabolism caused by physical exertion and/or a heated environment which can lead to exhaustion, mental confusion, disorientation, dehydration, loss of consciousness, heart attack, stroke and other fatal illnesses.

Heat stress results from internal, metabolic heat buildup (from playing in sporting events, for example) and external stress related to environmental factors, such as football equipment. As the core temperature rises, so does the risk of heat stress. Performing strenuous tasks in the heated environment of a practice session/game or in warm or humid weather can also increase the risks of heat stress.

Simple preventative measures can be taken to avoid heat injuries, including drinking fluids frequently throughout the day to stay well-hydrated and wearing a single layer of porous cotton under uniform to keep the least amount of heat from becoming trapped near the body.

Becoming Acclimated

The rate at which people sweat is determined not only by genetics, but by hydration, state of acclimation and aerobic fitness. You can't sweat if your body doesn't have enough water. In order to maintain normal body function, players must replace fluid as soon as possible.

Acclimation is a physiological adaptation that the human body makes with repeated exposures to heat stress during exercise. It increases our rate of sweat production and shortens the time it takes for the sweating response to start and conserves sodium. Regular and sustained aerobic exercise can help with acclimation. Players who maintain an adequate level of fitness will have reduced cardiovascular strain and lower core temperature for the same level of heat stress. Fit players also tend to have reduced levels of body fat – and aren't carrying extra non-functional weight. Therefore, less energy is required by a fit person to do the same job as a less-fit person.

It is important for players to acclimate themselves to heat and know how to prepare for the summer weather. If sweat cannot evaporate, it doesn't matter how fit, how acclimated or how hydrated you are -- thermo-regulation will be compromised. In addition, it is essential that players are aware of the signs and symptoms of heat stress in order to detect it early and take the appropriate measures.

Heat Stress Symptoms

At first sign of symptoms, players should notify their coach in charge and immediately: institute work/rest cycles; keep cool and drink small amounts of the appropriate fluids; and use water spray bottles, fans and damp towels.

Some predisposing factors to heat stress include sustained exertion in the heat by unacclimatized players; lack of physical fitness and/or obesity; dehydration; individual

susceptibility; chronic cardiovascular disease; and failure to replace water lost in sweat.

To prevent heat stress, follow these guidelines:

- Acclimatize for five days by graded work in heat exposure.
- Drinking ample water frequently throughout the day and during practice.
- Ensure adequate salt intake with meals and supplement salt intake at meals for un-acclimatized players.

Players also need rehabilitation to ensure they can safely return to play. An effective rehabilitation program must include:

- Rest: a “time-out” to help players stabilize vital signs.
- Re-hydration: replacing lost fluids.
- Restoration of core temperature through “active cooling”.
- Medical monitoring and treatment if needed.

Glossary of Terms

Heat Index

Heat Index combines air temperature and relative humidity to determine an apparent temperature – or how hot it actually feels. High heat-index days can be health and life threatening, even to the non-exerciser.

Humidity

Humidity is the amount of moisture in the air. Humidity is of particular concern to those whose primary cooling mechanism is perspiration evaporating. It's the evaporation of that perspiration that causes some cooling effect, not the process of perspiring itself. In other words, in water-vapor-saturated air (high humidity), there is no evaporation of perspiration, and therefore, our principle cooling mechanism is not functioning for us.

Dew point

Dew point is the temperature at which a vapor begins to condense. Dew points are sometimes reported or used rather than relative humidity. Beware of dew points above 70.

The table below can be used to estimate the heat index. The heat index is an accurate measure of how hot it really feels when the effects of humidity are added to high temperature. When the heat index is between 90° F and 104° F, sunstroke, heat cramps or heat exhaustion are possible with prolonged exposure and physical activity. When the index is between 105° F and 129° F, sunstroke, heat cramps or heat exhaustion are likely and heatstroke is possible. Heat indices of 130° or higher will result in heatstroke or sunstroke quickly.

Stress the signs and treatment of heat-related illness.

Be sure to include this basic information in your training on heat hazards and first-aid:

- **Heat stress** is a common reaction to high temperatures, especially when accompanied by strenuous activity. Symptoms include thirst, fatigue, dizziness, and even difficulty seeing.
What to do: Take a break in a cool place and drink cool water or juice.
- **Heat cramps** are painful muscle spasms in arms, legs, or intestines that are caused by losing salt while sweating.

What to do: Cool down and drink water or juice. Also make sure the diet includes foods that will replace lost salt.

- Heat exhaustion** can make a person feel weak and possibly dizzy and/or nauseous. Other symptoms include chills, clammy skin, and profuse sweating.
What to do: Rest in a cool spot (preferably with feet slightly elevated) and drink plenty of fluids. If condition doesn't soon improve, seek medical attention. Take it easy for a few days following an incident, especially if excessive heat continues to be a work factor, and reduce the pace of activity.
- Heatstroke** is the most serious type of heat-related sickness and is, in fact, life threatening. Emergency medical attention is required. A victim of a heatstroke stops sweating, causing the body to overheat. Symptoms include hot and flushed skin, poor coordination, and confusion, possibly followed by loss of consciousness.
What to do: While waiting for the EMTs to arrive, move the person to a cool place, sponge with cold water, apply ice packs or cold drink cans, or immerse in cold water. Offer drinking water only if the person is conscious.
- Heat Index**
 The heat index (HI) is an accurate measure of how hot it really feels when the effects of humidity are added to high temperature.

The heat index is shown below in two tables. The first is a function of temperature/relative humidity (RH). The second is a function of temperature/dew point.

Heat Index Chart (Temperature & Relative Humidity)

RH (%)	Temperature (*F)															
	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
90	119	123	128	132	137	141	146	152	157	163	168	174	180	186	193	199
85	115	119	123	127	132	136	141	145	150	155	161	166	172	178	184	190
80	112	116	119	123	127	131	135	140	144	149	154	159	164	169	175	180
75	109	112	115	119	122	126	130	134	138	143	147	152	156	161	166	171
70	106	109	112	115	118	122	125	129	133	137	141	145	149	154	158	163
65	103	106	108	111	114	117	121	124	127	131	135	139	143	147	151	155
60	100	103	105	108	111	114	116	120	123	126	129	133	136	140	144	148
55	98	100	103	105	107	110	113	115	118	121	124	127	131	134	137	141
50	96	98	100	102	104	107	109	112	114	117	119	122	125	128	131	135
45	94	96	98	100	102	104	106	108	110	113	115	118	120	123	126	129
40	92	94	96	97	99	101	103	105	107	109	111	113	116	118	121	123
35	91	92	94	95	97	98	100	102	104	106	107	109	112	114	116	118
30	89	90	92	93	95	96	98	99	101	102	104	106	108	110	112	114

Note: Exposure to full sunshine can increase HI values by up to 15° F

Heat Index Chart (Temperature & Dewpoint)

Dewpt (° F)	Temperature (° F)															
	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
65	94	95	96	97	98	100	101	102	103	104	106	107	108	109	110	112
66	94	95	97	98	99	100	101	103	104	105	106	108	109	110	111	112
67	95	96	97	98	100	101	102	103	105	106	107	108	110	111	112	113
68	95	97	98	99	100	102	103	104	105	107	108	109	110	112	113	114
69	96	97	99	100	101	103	104	105	106	106	109	110	111	113	114	115
70	97	98	99	101	102	103	105	106	107	109	110	111	112	114	115	116
71	98	99	100	102	103	104	106	107	108	109	111	112	113	115	116	117
72	98	100	101	103	104	105	107	108	109	111	112	113	114	116	117	118
73	99	101	102	103	105	106	108	109	110	112	113	114	116	117	118	119
74	100	102	103	104	106	107	109	110	111	113	114	115	117	118	119	121
75	101	103	104	106	107	108	110	111	113	114	115	117	118	119	121	122
76	102	104	105	107	108	110	111	112	114	115	117	118	119	121	122	123
77	103	105	106	108	109	111	112	114	115	117	118	119	121	122	124	125
78	105	106	108	109	111	112	114	115	117	118	119	121	122	124	125	126
79	106	107	109	111	112	114	115	117	118	120	121	122	124	125	127	128
80	107	109	110	112	114	115	117	118	120	121	123	124	126	127	128	130
81	109	110	112	114	115	117	118	120	121	123	124	126	127	129	130	132
82	110	112	114	115	117	118	120	122	123	125	126	128	129	131	132	133

Note: Exposure to full sunshine can increase HI values by up to 15° F