

NCHSAA HEAT GUIDELINES

The fundamentals of a Heat Acclimatization Program are as follows:

- 1) A Certified Athletic Trainer or 1st Responder **MUST** be in attendance at all football practices and games.
- 2) Physical exertion and training activities should begin slowly and continue progressively. An athlete cannot be conditioned in a period of only two to three weeks.
 - a. Begin with shorter, less intense practices and training activities, with longer recovery intervals between bouts of activity.
 - b. Minimize protective gear (helmets only, no shoulder pads) during first several practices, and introduce additional uniform and protective gear progressively over successive days.
 - c. Emphasize instruction over conditioning during the first several practices.
- 3) Keep each athlete's individual level of conditioning and medical status in mind and adjust activity according. These factors directly affect exertional heat illness risk. For example, there is an increased risk if the athlete is obese, unfit, has been recently ill, has a previous history of exertional heat illness, or has Sickle Cell Trait.
- 4) Adjust intensity (lower) and rest breaks (increase frequency/duration), and consider reducing uniform and protective equipment, while being sure to monitor all players more closely as conditions are increasingly warm/humid, especially if there is a change in weather from the previous few days.
- 5) Athletes must begin practices and training activities adequately hydrated.
- 6) Recognize early signs of distress and developing exertional heat illness, and promptly adjust activity and treat appropriately. First aid should not be delayed.
- 7) Recognize more serious signs of exertional heat illness (clumsiness, stumbling, collapse, obvious behavioral changes and /or other central nervous system problems), immediately stop activity and promptly seek medical attention by activating the Emergency Medical System. On-site rapid cooling should begin immediately.
- 8) An Emergency Action Plan (EAP) with clearly defined written and practiced protocols should be developed and in place ahead of time.
- 9) Prior to season all coaches, athletic training personnel and first responders working with team should review signs and symptoms of heat illness and the emergency action plan for their school.

Precautions must be taken to prevent heat-related problems. Please pay particular attention to the following:

- A Heat Index chart should be available at practices and contests
- A copy of the Emergency Action Plan that outlines steps to take in case of severe environmental conditions, should be on-site.
- Supplies for rapid cooling should be on-site. These should include a simple "toddler swimming pool" or tank for rapid immersion.

Management and Prevention Guidelines and Recommendations

1. Measure WBGT reading if this can be done accurately onsite. If not, determine this from weather station or reliable airport site within 5 to 10 miles of practice site. If WBGT is not available, determine temperature in F/C and Relative Humidity and refer to the following Heat Index Chart.
2. As temperatures increase, minimize clothing and equipment.
3. Provide unlimited drinking opportunities during hotter practices. NEVER withhold water from athletes.
4. If and when possible, pre and post-practice weigh-ins should be conducted. (NOTE: an athlete who is not within 3% of the previous pre-practice weight should be withheld from practice. These athletes should be counseled on the importance of re-hydrating.)

Note: The color code below for WBGT is the same as NCHSAA. The NOAA Heat Index color code has been changed to match up with the WBGT color code for consistency. Color codes are for your use if desired.

WBGT and Heat Index - Physical Exercise Chart		
WBGT Index (F)	Heat Index	Athletic Activity Guidelines
Less than 80	Less than 80	Unlimited activity with primary cautions for new or unconditioned athletes or extreme exertion; schedule mandatory rest / water breaks (5 min water / rest break every 30 min)
80 - 84.9	80 - 90	Normal practice for athletes; closely monitor new or unconditioned athletes and all athletes during extreme exertion. Schedule mandatory rest / water breaks. (5 min water / rest break every 25 min)
85 - 87.9	91 - 103	New or unconditioned athletes should not practice. Well conditioned athletes should have more frequent rest breaks and hydration as well as cautious monitoring for symptoms of heat illness. Schedule frequent mandatory rest / water breaks. (5 min water / rest break every 20 min) Have immersion pool on site for practice.
88 - 89.9	104 - 124	All athletes must be under constant observation and supervision. Remove pads and equipment. Schedule frequent mandatory rest / water breaks. (5 min water / rest break every 15 min) Have immersion pool on site for practice.
90 or Above	125 and up	SUSPEND PRACTICE

NOAA's National Weather Service
Heat Index

Humidity	Temperature															
	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Green - Caution Yellow - Extreme Caution Red - Danger Black - Extreme Danger

Management of Suspected or Possible Heat Stroke

Activate emergency medical system immediately; if appropriate medical staff is on-site, cool first and transport second whenever possible.

Remove all equipment and excess clothing.

Immerse the athlete in a tub of cold water (the colder the better); water temperature should be between 35 to 60°F (2 to 15°C); ice water is ideal but even tepid water is helpful; maintain an appropriately cool water temperature; stir the water vigorously during cooling.

Monitor vital signs (rectal temperature, heart rate, respiratory rate, blood pressure) and mental status continually. Maintain patient safety.

Cease cooling when rectal temperature reaches 101 to 102°F (38.3 to 38.9°C).

NOTE: Since rectal temperature measurement is essential for diagnosis and management of a heat stroke, when possible a Rectal Thermometer should be accessible on-site.

Alternative cooling

- When immersion is not available follow all other steps above and do the following:
- Place icepacks at head, neck, axillae and groin
- Bathe face and trunk with iced or tepid water
- Fan athlete to help the cooling process
- Move to shaded or air conditioned area if available near the practice site.

HEAT EXHAUSTION

The clinical criteria for heat exhaustion generally include the following:

- Athlete has obvious difficulty continuing with exercise
- Body temperature is usually 101 to 104°F (38.3 to 40.0°C) at the time of collapse
- No significant dysfunction of the central nervous system is present (e.g, seizure, altered consciousness, persistent delirium)

If any central nervous system dysfunction develops, such as mild confusion, it resolves quickly with rest and cooling.

Patients with heat exhaustion may also manifest:

- Tachycardia and hypotension
- Extreme weakness
- Dehydration and electrolyte losses
- Ataxia and coordination problems, syncope, light-headedness
- Profuse sweating, pallor, "prickly heat" sensations
- Headache
- Abdominal cramps, nausea, vomiting, diarrhea
- Persistent muscle cramps

SIGNS AND SYMPTOMS OF HEAT STROKE

The two main criteria for diagnosing exertional heat stroke:

- Rectal temperature above 104°F (40°C), measured immediately following collapse during strenuous activity
- CNS dysfunction: possible symptoms and signs: disorientation, headache, irrational behavior, irritability, emotional instability, confusion, altered consciousness, coma, or seizure.

CLINICAL FINDINGS:

- Most patients are tachycardic and hypotensive.
- Hyperventilation, dizziness, nausea, vomiting, diarrhea, weakness, profuse sweating
- Dehydration, dry mouth, thirst, muscle cramps, loss of muscle function, and ataxia.
- Absence of sweating with heat stroke is not typical and usually indicates additional medical issues.

Ref. Oconor and Casa UpToDate 2012

WCPSS - Following NCHSAA Heat Guidelines

The Wet Bulb Globe Temperature (WBGT) is a composite temperature used to estimate the effect of temperature, humidity, wind speed (wind chill) and solar radiation on humans. The Wet Bulb Globe Temperature Index accounts for the impact that direct sunlight has on the human body. The WBGT Index combines wet and dry temperatures with a "Black Globe" temperature to accurately reflect the current risk. The American College of Sports Medicine and many state athletic associations recognize the value of WBGT readings in assessing the risk of heat-related illness.

Each high school will be provided a Wet Globe Kit to measure WBGT. Each middle school will be paired up with a high school athletic trainer to receive the WBGT measurement prior to middle school practice daily while hot weather conditions persist. High school athletic trainers will be provided training on the use of the Wet Globe Kit at the annual athletic director/athletic trainer meeting in July.

Per NCHSAA Heat Guidelines, WBGT measurement will be used when available. If WBGT is not available, heat index will be used to determine the current risk.

Measuring Heat Index

- There are many devices that can measure heat index (Precision Heat Index Instrument, Heat and Humidity Monitor, SkyScan Ti-Plus Weather Monitor and Heat Index Warning System).
- Heat Index can be determined by entering the zip code at your location at these websites: <http://www.osaa.org/heatindex/> or <http://www.ihsaa.net/HeatIndex/Default.aspx>.
- Heat index can also be found by entering air temperature and relative humidity at this website: <http://www.hpc.ncep.noaa.gov/html/heatindex.shtml>.
- Heat index can be found at most weather websites, and most local television weather stations and websites.

Athletic Participation Form

- Board Policy 6860 requires that all athletes receive a medical examination once every 365 days.
- The athletic trainer shall insure that no athlete participates without fully completing the athletic participation form and being cleared to participate by authorized medical personnel.
- If an athlete's medical history shows that the athlete has suffered from a heat-related illness, the athlete shall receive one-on-one instruction from the athletic trainer or designee about symptoms of heat illness and the importance of hydration.

Pre and Post Weigh-Ins (Football Only)

1. Daily pre and post practice weigh-ins should be taken and any athlete who is not within 3% of the previous days pre-practice weight should be withheld from practice. Athletes who lose more than 3% of their weight during a practice should also be counseled on the importance of pre-hydrating, drinking more fluids during the practice session, and post practice re-hydration. For high schools, weigh-ins must be done under the supervision of the head athletic trainer or designee beginning with the first day of fall practice and continuing to Labor Day. On or after Labor Day, weigh-ins must be done any time the wet-bulb temperature is in the Code Yellow or Code Red category, and for athletes susceptible to heat illness (see #2 below). For middle schools, weigh-ins must be done under the supervision of the athletic trainer or designee beginning with the first day of fall practice and continuing through September 30th. After September 30th, weigh-ins must be done any time the wet-bulb temperature is in the Code Yellow or Code Red category, and for athletes susceptible to heat illness (see #2 below). Note: Supervision means making sure that pre and post weigh-ins are properly taken, recorded, and evaluated for 3% weight loss. The football coach will help set provisions for weigh-ins for players (must include no weigh-in/no practice rule and weigh-ins for players late to practice).
2. A list of athletes most susceptible to heat illness must be maintained by the athletic trainer and communicated to the coaching staff. This list should include, but not be limited to, athletes with a medical history of heat illness, athletes losing more than 3% of their weight during a practice, and athletes that have reported symptoms of heat illness during the season to the athletic trainer. Others more susceptible to heat illness are febrile illness (current or recent fever), taking medications (especially ones with a diuretic effect or that act as a stimulant), and sickle cell trait.
3. The athletes most susceptible to heat illness should receive one-on-one instruction from the athletic trainer or designee about symptoms of heat illness and the importance of hydration.
4. The athletic trainer or designee should recommend to athletes most susceptible to heat illness that they consult with their doctor for additional guidance. If an athlete's doctor informs the coaching staff or athletic trainer that the athlete has suffered a heat-related illness during the season, the athlete may not participate until cleared in writing by the doctor.

Coaches and Athletes Education

- The athletic trainer will provide the coaches with information on heat illness including heat illness symptoms and proper hydration. In case a middle school does not have a person filling the athletic trainer position, the athletic director will provide this information.
- Athletes should be informed of the importance of hydration, the symptoms of heat illness, and their personal responsibility to inform the athletic trainer or coaching staff if they suffer any symptoms of heat illness.
- Teams should use the "buddy" system (two players who play the same position are assigned to "keep an eye on" each other).
- Any coach notified or aware of any athlete exhibiting a symptom of heat illness shall notify the athletic trainer.

HEAT ILLNESS PREVENTION THE 3% LIMIT

Appendix I-1

<u>Weight</u>	<u>Less 3%</u>	<u>Weight</u>	<u>Less 3%</u>	<u>Weight</u>	<u>Less 3%</u>	<u>Weight</u>	<u>Less 3%</u>	<u>Weight</u>	<u>Less 3%</u>
100	97.00	151	146.47	202	195.94	253	245.41	304	294.88
101	97.97	152	147.44	203	196.91	254	246.38	305	295.85
102	98.94	153	148.41	204	197.88	255	247.35	306	296.82
103	99.91	154	149.38	205	198.85	256	248.32	307	297.79
104	100.88	155	150.35	206	199.82	257	249.29	308	298.76
105	101.85	156	151.32	207	200.79	258	250.26	309	299.73
106	102.82	157	152.29	208	201.76	259	251.23	310	300.70
107	103.79	158	153.26	209	202.73	260	252.20	311	301.67
108	104.76	159	154.23	210	203.70	261	253.17	312	302.64
109	105.73	160	155.20	211	204.67	262	254.14	313	303.61
110	106.70	161	156.17	212	205.64	263	255.11	314	304.58
111	107.67	162	157.14	213	206.61	264	256.08	315	305.55
112	108.64	163	158.11	214	207.58	265	257.05	316	306.52
113	109.61	164	159.08	215	208.55	266	258.02	317	307.49
114	110.58	165	160.05	216	209.52	267	258.99	318	308.46
115	111.55	166	161.02	217	210.49	268	259.96	319	309.43
116	112.52	167	161.99	218	211.46	269	260.93	320	310.40
117	113.49	168	162.96	219	212.43	270	261.90	321	311.37
118	114.46	169	163.93	220	213.40	271	262.87	322	312.34
119	115.43	170	164.90	221	214.37	272	263.84	323	313.31
120	116.40	171	165.87	222	215.34	273	264.81	324	314.28
121	117.37	172	166.84	223	216.31	274	265.78	325	315.25
122	118.34	173	167.81	224	217.28	275	266.75	326	316.22
123	119.31	174	168.78	225	218.25	276	267.72	327	317.19
124	120.28	175	169.75	226	219.22	277	268.69	328	318.16
125	121.25	176	170.72	227	220.19	278	269.66	329	319.13
126	122.22	177	171.69	228	221.16	279	270.63	330	320.10
127	123.19	178	172.66	229	222.13	280	271.60	331	321.07
128	124.16	179	173.63	230	223.10	281	272.57	332	322.04
129	125.13	180	174.60	231	224.07	282	273.54	333	323.01
130	126.10	181	175.57	232	225.04	283	274.51	334	323.98
131	127.07	182	176.54	233	226.01	284	275.48	335	324.95
132	128.04	183	177.51	234	226.98	285	276.45	336	325.92
133	129.01	184	178.48	235	227.95	286	277.42	337	326.89
134	129.98	185	179.45	236	228.92	287	278.39	338	327.86
135	130.95	186	180.42	237	229.89	288	279.36	339	328.83
136	131.92	187	181.39	238	230.86	289	280.33	340	329.80
137	132.89	188	182.36	239	231.83	290	281.30	341	330.77
138	133.86	189	183.33	240	232.80	291	282.27	342	331.74
139	134.83	190	184.30	241	233.77	292	283.24	343	332.71
140	135.8	191	185.27	242	234.74	293	284.21	344	333.68
141	136.77	192	186.24	243	235.71	294	285.18	345	334.65
142	137.74	193	187.21	244	236.68	295	286.15	346	335.62
143	138.71	194	188.18	245	237.65	296	287.12	347	336.59
144	139.68	195	189.15	246	238.62	297	288.09	348	337.56
145	140.65	196	190.12	247	239.59	298	289.06	349	338.53
146	141.62	197	191.09	248	240.56	299	290.03	350	339.50
147	142.59	198	192.06	249	241.53	300	291.00	351	340.47
148	143.56	199	193.03	250	242.50	301	291.97	352	341.44
149	144.53	200	194.00	251	243.47	302	292.94	353	342.41
150	145.50	201	194.97	252	244.44	303	293.01	354	343.38

