



Kentucky High School Athletic Association

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KENTUCKY MEDICAL ASSOCIATION / KENTUCKY HIGH SCHOOL ATHLETIC ASSOCIATION PROCEDURE FOR AVOIDING HEAT INJURY / ILLNESS THROUGH ANALYSIS OF HEAT INDEX AND RESTRUCTURING OF ACTIVITIES

Complete listing of support documents available at <http://www.khsaa.org/sportsmedicine/>

Original Procedure Made by the Kentucky Medical Association Committee on Physical Education and Medical Aspects of Sports to and for the Kentucky High School Athletic Association and adopted by the KHSAA Board of Control as recommendation for all schools, May, 2002

On site Procedures Revised by KHSAA Board of Control, February 13, 2003

On site procedures further Revised and Made Mandatory for all schools by the KHSAA Board of Control, May, 2005

On site procedures further revised with respect to testing instruments, March, 2007

INTRODUCTION

Following months of study, after one year of implementation and in an effort to help protect the health and safety of student-athletes participating in high school sports, the Kentucky Medical Association Committee on Physical Education and Medical Aspects of Sports issued a recommended procedure to the Kentucky High School Athletic Association for immediate implementation in 2002. This procedure called for the determination of the Heat Index (using on site devices to measure Temperature and Relative Humidity), and a guideline for activity to be conducted at that time based on the Heat Index reading. Though other procedures and measurements were considered, the application of the Heat Index appeared to be most readily implementable on a state wide basis, and appeared to be reliably tested in other areas.

Through the first five years of use of the procedure, minor adjustments were made in the reporting requirements, and the on site devices to be used. In May, 2005, the Board of Control through its policies directed that all member school comply with the testing and reporting requirements. In October, 2006, the member schools of the Association overwhelming approved at their Annual Meeting, a proposal to make such reporting not simply a Board of Control policy, but a school supported and approved Bylaw as it approved Proposal 9 to amend KHSAA Bylaw 17 (full details are available at

<http://www.khsaa.org/annualmeeting/20062007/annualmeetingproposals20062007.pdf>)

In March, 2007, the Kentucky Medical Association Committee on Physical Education and Medical Aspects of Sports recommended the elimination of all devices with the exception of the Digital Sling Psychrometer as a means of measuring at the competition/practice site.

GENERAL PROCEDURE

The procedure calls for the determination of the Temperature and Relative Humidity at the practice / contest site using a Digital Sling psychrometer. It is important to note that media-related temperature readings (such as the Weather Channel, local radio, etc.), or even other readings in the general proximity are not permitted as they may not yield defensible results when considering the recommended scale. The readings must be made at the site.

Neither the KHSAA nor KMA has endorsed any particular brand of psychrometer and receives no endorsement fee or other consideration for any device sold. There are several models on the market that will properly perform the functions, including companies such as Medco and others. The KHSAA or your local Certified Athletic Trainer has easy access to catalogs with this type of equipment. In addition, the KHSAA web site has a variety of links to various dealers.

INDOOR AND OUTDOOR VENUES

While much of the original discussion concerning this package centered on outdoor sports, the Kentucky Medical Association Committee on Physical Education and Medical Aspects of Sports has advised the KHSAA that indoor sports, particularly in times of year or facilities where air conditioning may not be available, should be included in the testing. Such has been approved by the Board of Control as policy requirement. The recommendations contained in this package clearly cover both indoor and outdoor activity, as well as contact and non-contact sports.

PROCEDURE FOR TESTING

Thirty (30) minutes prior to the start of activity, temperature and humidity readings should be taken at the practice / competition site.

The information should be recorded on KHSAA Form GE20 and these records shall be available for inspection upon request. All schools will be required to submit this form. For 2007, there will be online reporting for submitting this form.

The temperature and humidity should be factored into the Heat Index Calculation and Chart and a determination made as to the Heat Index. If schools are utilizing a digital sling psychrometer that calculates the Heat Index, that number may be used to apply to the regulation table.

If a reading is determined whereby activity is to be decreased (above 95 degrees Heat Index), then re-readings would be required every thirty (30) minutes to determine if further activity should be eliminated or preventative steps taken, or if an increased level of activity can resume.

Using the following scale, activity must be altered and / or eliminated based on this Heat Index as determined –

Under 95 degrees Heat Index	<ul style="list-style-type: none"> ❖ All sports <ul style="list-style-type: none"> ➤ Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. ➤ Optional water breaks every 30 minutes for 10 minutes in duration ➤ Ice-down towels for cooling ➤ Watch/monitor athletes carefully for necessary action.
95 degrees to 99 degrees Heat Index	<ul style="list-style-type: none"> ❖ All sports <ul style="list-style-type: none"> ➤ Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. ➤ Mandatory water breaks every 30 minutes for 10 minutes in duration ➤ Ice-down towels for cooling ➤ Watch/monitor athletes carefully for necessary action. ❖ Contact sports and activities with additional equipment <ul style="list-style-type: none"> ➤ Helmets and other possible equipment removed while not involved in contact. ❖ Reduce time of outside activity. Consider postponing practice to later in the day. ❖ Re-check temperature and humidity every 30 minutes to monitor for increased Heat Index.
100 degrees to 104 degrees Heat Index	<ul style="list-style-type: none"> ❖ All sports <ul style="list-style-type: none"> ➤ Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. ➤ Mandatory water breaks every 30 minutes for 10 minutes in duration ➤ Ice-down towels for cooling ➤ Watch/monitor athletes carefully for necessary action. ➤ Alter uniform by removing items if possible ➤ Allow for changes to dry t-shirts and shorts. ➤ Reduce time of outside activity as well as indoor activity if air conditioning is unavailable. ➤ Postpone practice to later in day. ❖ Contact sports and activities with additional equipment <ul style="list-style-type: none"> ➤ Helmets and other possible equipment removed if not involved in contact or necessary for safety. If necessary for safety, suspend activity. ❖ Re-check temperature and humidity every 30 minutes to monitor for increased Heat Index.
Above 104 degrees Heat Index	<ul style="list-style-type: none"> ❖ All Sports <ul style="list-style-type: none"> ➤ Stop all outside activity in practice and/or play, and stop all inside activity if air conditioning is unavailable.

This procedure is to be used until such time as the temperature is below 80 degrees as no combination of heat and humidity at that level will result in a need to curtail activity. The KHSAA will use September 15 as the standard date for the return of the Heat Index forms but reminds its member schools that the monitoring shall continue until such a time that no combination of heat and humidity at that level will result in a need to curtail activity.

SUMMARY

Though much more scientific information and other alternative methods for determining Heat Index and participation restrictions are being studied, these initial steps should help ensure the health and safety of the participants in high school sports. Adherence to these guidelines represents a conscious effort by the interscholastic community to emphasize health and safety on a much higher level than any loss of competitive preparation. Any further revisions or enhancements will be distributed to the members of the KHSAA.

Heat Index Calculation and Chart

Temperature (in Fahrenheit)

Relative Humidity at Site

	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
100	84	87	91	95	99	103	107	112	116	121	126	132	137	143	149	155	161	168	174	181	188
99	84	87	91	94	98	102	106	111	116	120	125	131	136	142	147	153	160	166	172	179	186
98	84	87	90	94	98	102	106	110	115	120	124	130	135	140	146	152	158	164	171	177	184
97	84	87	90	94	97	101	105	110	114	119	124	129	134	139	145	151	157	163	169	176	182
96	83	87	90	93	97	101	105	109	113	118	123	128	133	138	144	149	155	161	167	174	180
95	83	86	90	93	97	100	104	108	113	117	122	127	132	137	142	148	154	160	166	172	179
94	83	86	89	93	96	100	104	108	112	116	121	126	131	136	141	147	152	158	164	170	177
93	83	86	89	92	96	99	103	107	111	116	120	125	130	135	140	145	151	157	162	169	175
92	83	86	89	92	95	99	103	106	111	115	119	124	129	133	139	144	149	155	161	167	173
91	83	86	89	92	95	98	102	106	110	114	118	123	127	132	137	143	148	154	159	165	171
90	83	86	88	91	95	98	102	105	109	113	117	122	126	131	136	141	147	152	158	164	170
89	83	85	88	91	94	98	101	105	109	113	117	121	125	130	135	140	145	151	156	162	168
88	83	85	88	91	94	97	101	104	108	112	116	120	125	129	134	139	144	149	155	160	166
87	83	85	88	91	94	97	100	104	107	111	115	119	124	128	133	138	143	148	153	159	164
86	83	85	88	90	93	96	100	103	107	110	114	118	123	127	132	136	141	146	152	157	163
85	83	85	87	90	93	96	99	102	106	110	113	117	122	126	130	135	140	145	150	155	161
84	82	85	87	90	93	96	99	102	105	109	113	117	121	125	129	134	139	144	149	154	159
83	82	85	87	90	92	95	98	101	105	108	112	116	120	124	128	133	137	142	147	152	158
82	82	85	87	89	92	95	98	101	104	108	111	115	119	123	127	132	136	141	146	151	156
81	82	84	87	89	92	94	97	100	104	107	110	114	118	122	126	131	135	140	144	149	155
80	82	84	86	89	91	94	97	100	103	106	110	113	117	121	125	129	134	138	143	148	153
79	82	84	86	89	91	94	96	99	102	106	109	113	116	120	124	128	133	137	142	146	151
78	82	84	86	88	91	93	96	99	102	105	108	112	115	119	123	127	131	136	140	145	150
77	82	84	86	88	90	93	96	98	101	104	108	111	115	118	122	126	130	135	139	144	148
76	82	84	86	88	90	93	95	98	101	104	107	110	114	117	121	125	129	133	138	142	147
75	82	84	85	88	90	92	95	97	100	103	106	109	113	116	120	124	128	132	136	141	145
74	82	83	85	87	89	92	94	97	100	103	106	109	112	116	119	123	127	131	135	140	144
73	82	83	85	87	89	91	94	96	99	102	105	108	111	115	118	122	126	130	134	138	143
72	82	83	85	87	89	91	93	96	99	101	104	107	111	114	117	121	125	129	133	137	141
71	81	83	85	87	89	91	93	96	98	101	104	107	110	113	116	120	124	127	131	136	140
70	81	83	85	86	88	90	93	95	98	100	103	106	109	112	116	119	123	126	130	134	138
69	81	83	84	86	88	90	92	95	97	100	102	105	108	111	115	118	122	125	129	133	137
68	81	83	84	86	88	90	92	94	97	99	102	105	108	111	114	117	121	124	128	132	136
67	81	83	84	86	88	90	92	94	96	99	101	104	107	110	113	116	120	123	127	131	135
66	81	82	84	86	87	89	91	93	96	98	101	103	106	109	112	115	119	122	126	129	133
65	81	82	84	85	87	89	91	93	95	98	100	103	105	108	111	114	118	121	125	128	132
64	81	82	84	85	87	89	91	93	95	97	99	102	105	108	110	114	117	120	123	127	131
63	81	82	84	85	87	88	90	92	94	97	99	101	104	107	110	113	116	119	122	126	130
62	81	82	83	85	86	88	90	92	94	96	98	101	103	106	109	112	115	118	121	125	128
61	81	82	83	85	86	88	90	91	93	96	98	100	103	105	108	111	114	117	120	124	127
60	81	82	83	84	86	88	89	91	93	95	97	100	102	105	107	110	113	116	119	123	126
59	81	82	83	84	86	87	89	91	93	95	97	99	102	104	107	109	112	115	118	122	125
58	81	82	83	84	85	87	89	90	92	94	96	99	101	103	106	109	111	114	117	120	124
57	80	81	83	84	85	87	88	90	92	94	96	98	100	103	105	108	111	113	116	119	123
56	80	81	83	84	85	86	88	90	92	93	95	98	100	102	105	107	110	113	115	118	122
55	80	81	82	84	85	86	88	89	91	93	95	97	99	101	104	106	109	112	114	117	120
54	80	81	82	83	85	86	87	89	91	93	94	96	99	101	103	106	108	111	114	116	119
53	80	81	82	83	84	86	87	89	90	92	94	96	98	100	103	105	107	110	113	116	118
52	80	81	82	83	84	86	87	88	90	92	94	96	98	100	102	104	107	109	112	115	117
51	80	81	82	83	84	85	87	88	90	91	93	95	97	99	101	104	106	108	111	114	116
50	80	81	82	83	84	85	86	88	89	91	93	95	97	99	101	103	105	108	110	113	115
49	80	81	82	83	84	85	86	88	89	91	92	94	96	98	100	102	105	107	109	112	115
48	80	81	81	82	84	85	86	87	89	90	92	94	96	97	100	102	104	106	109	111	114
47	80	81	81	82	83	85	86	87	88	90	92	93	95	97	99	101	103	105	108	110	113
46	80	80	81	82	83	84	86	87	88	90	91	93	95	96	98	100	103	105	107	109	112
45	80	80	81	82	83	84	85	87	88	89	91	92	94	96	98	100	102	104	106	109	111
44	80	80	81	82	83	84	85	86	88	89	91	92	94	96	97	99	101	103	106	108	110
43	79	80	81	82	83	84	85	86	87	89	90	92	93	95	97	99	101	103	105	107	109
42	79	80	81	82	83	84	85	86	87	88	90	91	93	95	96	98	100	102	104	106	109
41	79	80	81	82	82	83	85	86	87	88	90	91	93	94	96	98	100	101	104	106	108
40	79	80	81	81	82	83	84	85	87	88	89	91	92	94	95	97	99	101	103	105	107

Under 95 degrees Heat Index	<ul style="list-style-type: none"> All sports Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. Optional water breaks every 30 minutes for 10 minutes in duration Ice-down towels for cooling Watch/monitor athletes carefully for necessary action.
95 degrees to 99 degrees Heat Index	<ul style="list-style-type: none"> All sports Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. Mandatory water breaks every 30 minutes for 10 minutes in duration Ice-down towels for cooling Watch/monitor athletes carefully for necessary action. Contact sports and activities with additional equipment Helmets and other possible equipment removed if not involved in contact. Reduce time of outside activity. Consider postponing practice to later in the day. Re-check temperature and humidity every 30 minutes to monitor for increased Heat Index.

100 degrees to 104 degrees Heat Index	<ul style="list-style-type: none"> All sports Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. Mandatory water breaks every 30 minutes for 10 minutes in duration Ice-down towels for cooling Watch/monitor athletes carefully for necessary action. Alter uniform by removing items if possible Allow for changes to dry t-shirts and shorts. Reduce time of outside activity as well as indoor activity if air conditioning is unavailable. Postpone practice to later in day. Contact sports and activities with additional equipment Helmets and other possible equipment removed if not involved in contact or necessary for safety. If necessary for safety, suspend activity. Re-check temperature and humidity every 30 minutes to monitor for increased Heat Index.
Above 104 degrees Heat Index	<ul style="list-style-type: none"> All Sports Stop all outside activity in practice and/or play, and stop all inside activity if air conditioning is unavailable.

Heat Index Calculation and Chart

Temperature (in Fahrenheit)

Relative Humidity at Site

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99	84	87	91	94	98	102	106	111	116	120	125	131	136	142	147	153	160	166	172	179	186
98	84	87	90	94	98	102	106	110	115	120	124	130	135	140	146	152	158	164	171	177	184
97	84	87	90	94	97	101	105	110	114	119	124	129	134	139	145	151	157	163	169	176	182
96	83	87	90	93	97	101	105	109	113	118	123	128	133	138	144	149	155	161	167	174	180
95	83	86	90	93	97	100	104	108	113	117	122	127	132	137	142	148	154	160	166	172	179
94	83	86	89	93	96	100	104	108	112	116	121	126	131	136	141	147	152	158	164	170	177
93	83	86	89	92	96	99	103	107	111	116	120	125	130	135	140	145	151	157	162	169	175
92	83	86	89	92	95	99	103	106	111	115	119	124	129	133	139	144	149	155	161	167	173
91	83	86	89	92	95	98	102	106	110	114	118	123	127	132	137	143	148	154	159	165	171
90	83	86	88	91	95	98	102	105	109	113	117	122	126	131	136	141	147	152	158	164	170
89	83	85	88	91	94	98	101	105	109	113	117	121	125	130	135	140	145	151	156	162	168
88	83	85	88	91	94	97	101	104	108	112	116	120	125	129	134	139	144	149	155	160	166
87	83	85	88	91	94	97	100	104	107	111	115	119	124	128	133	138	143	148	153	159	164
86	83	85	88	90	93	96	100	103	107	110	114	118	123	127	132	136	141	146	152	157	163
85	83	85	87	90	93	96	99	102	106	110	113	117	122	126	130	135	140	145	150	155	161
84	82	85	87	90	93	96	99	102	105	109	113	117	121	125	129	134	139	144	149	154	159
83	82	85	87	90	92	95	98	101	105	108	112	116	120	124	128	133	137	142	147	152	158
82	82	85	87	89	92	95	98	101	104	108	111	115	119	123	127	132	136	141	146	151	156
81	82	84	87	89	92	94	97	100	104	107	110	114	118	122	126	131	135	140	144	149	155
80	82	84	86	89	91	94	97	100	103	106	110	113	117	121	125	129	134	138	143	148	153
79	82	84	86	89	91	94	96	99	102	106	109	113	116	120	124	128	133	137	142	146	151
78	82	84	86	88	91	93	96	99	102	105	108	112	115	119	123	127	131	136	140	145	150
77	82	84	86	88	90	93	96	98	101	104	108	111	115	118	122	126	130	135	139	144	148
76	82	84	86	88	90	93	95	98	101	104	107	110	114	117	121	125	129	133	138	142	147
75	82	84	85	88	90	92	95	97	100	103	106	109	113	116	120	124	128	132	136	141	145
74	82	83	85	87	89	92	94	97	100	103	106	109	112	116	119	123	127	131	135	140	144
73	82	83	85	87	89	91	94	96	99	102	105	108	111	115	118	122	126	130	134	138	143
72	82	83	85	87	89	91	93	96	99	101	104	107	111	114	117	121	125	129	133	137	141
71	81	83	85	87	89	91	93	96	98	101	104	107	110	113	116	120	124	127	131	136	140
70	81	83	85	86	88	90	93	95	98	100	103	106	109	112	116	119	123	126	130	134	138
69	81	83	84	86	88	90	92	95	97	100	102	105	108	111	115	118	122	125	129	133	137
68	81	83	84	86	88	90	92	94	97	99	102	105	108	111	114	117	121	124	128	132	136
67	81	83	84	86	88	90	92	94	96	99	101	104	107	110	113	116	120	123	127	131	135
66	81	82	84	86	87	89	91	93	96	98	101	103	106	109	112	115	119	122	126	129	133
65	81	82	84	85	87	89	91	93	95	98	100	103	105	108	111	114	118	121	125	128	132
64	81	82	84	85	87	89	91	93	95	97	99	102	105	108	110	114	117	120	123	127	131
63	81	82	84	85	87	88	90	92	94	97	99	101	104	107	110	113	116	119	122	126	130
62	81	82	83	85	86	88	90	92	94	96	98	101	103	106	109	112	115	118	121	125	128
61	81	82	83	85	86	88	90	91	93	96	98	100	103	105	108	111	114	117	120	124	127
60	81	82	83	84	86	88	89	91	93	95	97	100	102	105	107	110	113	116	119	123	126
59	81	82	83	84	86	87	89	91	93	95	97	99	102	104	107	109	112	115	118	122	125
58	81	82	83	84	85	87	89	90	92	94	96	99	101	103	106	109	111	114	117	120	124
57	80	81	83	84	85	87	88	90	92	94	96	98	100	103	105	108	111	113	116	119	123
56	80	81	83	84	85	86	88	90	92	93	95	98	100	102	105	107	110	113	115	118	122
55	80	81	82	84	85	86	88	89	91	93	95	97	99	101	104	106	109	112	114	117	120
54	80	81	82	83	85	86	87	89	91	93	94	96	99	101	103	106	108	111	114	116	119
53	80	81	82	83	84	86	87	89	90	92	94	96	98	100	103	105	107	110	113	116	118
52	80	81	82	83	84	86	87	88	90	92	94	96	98	100	102	104	107	109	112	115	117
51	80	81	82	83	84	85	87	88	90	91	93	95	97	99	101	104	106	108	111	114	116
50	80	81	82	83	84	85	86	88	89	91	93	95	97	99	101	103	105	108	110	113	115
49	80	81	82	83	84	85	86	88	89	91	92	94	96	98	100	102	105	107	109	112	115
48	80	81	81	82	84	85	86	87	89	90	92	94	96	97	100	102	104	106	109	111	114
47	80	81	81	82	83	85	86	87	88	90	92	93	95	97	99	101	103	105	108	110	113
46	80	80	81	82	83	84	86	87	88	90	91	93	95	96	98	100	103	105	107	109	112
45	80	80	81	82	83	84	85	87	88	89	91	92	94	96	98	100	102	104	106	109	111
44	80	80	81	82	83	84	85	86	88	89	91	92	94	96	97	99	101	103	106	108	110
43	79	80	81	82	83	84	85	86	87	89	90	92	93	95	97	99	101	103	105	107	109
42	79	80	81	82	83	84	85	86	87	88	90	91	93	95	96	98	100	102	104	106	109
41	79	80	81	82	82	83	85	86	87	88	90	91	93	94	96	98	100	101	104	106	108
40	79	80	81	81	82	83	84	85	87	88	89	91	92	94	95	97	99	101	103	105	107

Under 95 degrees Heat Index	<ul style="list-style-type: none"> All sports Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. Optional water breaks every 30 minutes for 10 minutes in duration Ice-down towels for cooling Watch/monitor athletes carefully for necessary action.
95 degrees to 99 degrees Heat Index	<ul style="list-style-type: none"> All sports Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. Mandatory water breaks every 30 minutes for 10 minutes in duration Ice-down towels for cooling Watch/monitor athletes carefully for necessary action. Contact sports and activities with additional equipment <ul style="list-style-type: none"> Helmets and other possible equipment removed if not involved in contact. Reduce time of outside activity. Consider postponing practice to later in the day. Re-check temperature and humidity every 30 minutes to monitor for increased Heat Index.

100 degrees to 104 degrees Heat Index	<ul style="list-style-type: none"> All sports Provide ample amounts of water. This means that water should always be available and athletes should be able to take in as much water as they desire. Mandatory water breaks every 30 minutes for 10 minutes in duration Ice-down towels for cooling Watch/monitor athletes carefully for necessary action. Alter uniform by removing items if possible Allow for changes to dry t-shirts and shorts. Reduce time of outside activity as well as indoor activity if air conditioning is unavailable. <ul style="list-style-type: none"> Postpone practice to later in day. Contact sports and activities with additional equipment <ul style="list-style-type: none"> Helmets and other possible equipment removed if not involved in contact or necessary for safety. If necessary for safety, suspend activity. Re-check temperature and humidity every 30 minutes to monitor for increased Heat Index.
Above 104 degrees Heat Index	<ul style="list-style-type: none"> All Sports <ul style="list-style-type: none"> Stop all outside activity in practice and/or play, and stop all inside activity if air conditioning is unavailable.

