

Youth Football: Heat Stress and Injury Risk Recommendations and Guidelines

To safely and sufficiently acclimatize in the early season and improve the safety profile for each player, teams should use graduated repeated exposure to heat stress, training intensity and volume, and the football uniform, combined with appropriate alterations of practice intensity and duration, equipment cover, and between-practice recovery time. This will allow players to adapt more safely and effectively.

Acclimatization During the Football Preseason

Many athletes will report to preseason practice with minimal conditioning and without sufficient acclimatization to the heat. To minimize heat strain and allow a safe transition to full-intensity practice in full gear, gradual and increasing exposure to practice intensity and duration and gradual introduction of the different uniform configurations are critical. *Two-a-day conditioning and training sessions should not be introduced in the first week of preseason practice.*

If two-a-day sessions are introduced in the second week of practice, they should not be scheduled on consecutive days. A minimum of three hours with specific instructions should be given for the athletes to cool down, rest, eat, and sufficiently restore fluids between same-day sessions.

A suggested practice schedule emphasizing acclimatization during the first 14 days:

- Initial 6-day acclimatization period:
 - **Days 1 and 2** – Single practice session with helmets only, no live contact, and not to exceed three hours of warm-up, conditioning, instruction, breaks, and cool-down.
 - **Days 3, 4, and 5** – Single practice session with helmets and shoulder pads only, no live contact, and not to exceed three hours of warm-up, conditioning, instruction, breaks, and cool-down. Limited contact may be initiated with blocking sleds and tackling dummies on days four and five.
 - A second 60-min. walk-through may be scheduled each of the first five days for instruction in team formations and plays—however, there should be no running, conditioning, weight-room work, protective equipment (e.g., helmets, shoulder pads), or equipment related to football (e.g., footballs, blocking dummies, blocking sleds) during these sessions.
 - **Day 6** – Single practice session with full pads allowed not to exceed three hours of warm-up, conditioning, instruction, breaks, and cool-down, with no live contact drills (use sleds and tackling dummies only).
- **Day 7** – Off.
- **Days 8-13** – Allow multiple practice sessions on a two-a-day, one-a-day alternating rotation, with the option of full pads based on practice modification parameters (see next section), not to exceed three hours in one practice session (including warm-up, conditioning, instruction, breaks, and cool-down) and five hours a day combined practice duration (including all within-session breaks), with at least three continuous hours of recovery time between same-day sessions.
- Intra-squad scrimmages should not be scheduled before day 12 of the 14-day period.
- **Day 14** – Off.

Practice Modifications to Reduce Heat Exhaustion or Exertional Heat Stroke Risk

With increasing levels of heat and humidity, the risk for heat exhaustion or exertional heat stroke can increase dramatically, especially if practice intensity is high. Insulating football protective equipment further increases the risk.

- Practices should be modified for the safety of the athletes, in relation to the degree of environmental heat stress on the practice field.
- Midday (12–4 p.m.) is often the hottest part of the day, especially on a bright, sunny day. However, late afternoon or early evening (4–7 p.m.) can be just as hot or hotter during the summer months.
- When conditions are too extreme (i.e., unusual high heat and humidity), practice should be canceled, moved into air-conditioned spaces, or held outside as walk-through

sessions with no protective gear or conditioning activities, with regular breaks for fluid consumption and reduced sun exposure.

- Adjust the work-to-rest ratio by lowering the activity duration and/or intensity and increasing the frequency and duration of breaks to lessen the thermal strain on players.
- Many activities can be continued safely by removing equipment and having players in shorts with helmets and shoulder pads only (not full equipment) or shorts only (with all protective equipment removed), as heat stress increases.
- Players should wear as little covering as is appropriate and helmets should be taken off whenever possible (e.g., during instruction).
- Players should wear light-colored clothing during practice and use shade (if available) during breaks.
- Regular breaks should be included in each practice session schedule, to allow rest, cooling, and fluid replacement, at least every 30–45 min. Breaks should be more frequent, as heat and humidity rise.
- Provide easy access (not too far away and plenty of fluid stations) to chilled fluids and adequate time for drinking.
- Athletic trainers or volunteer staff should bring fluid to players on the field between “official” breaks, using portable fluid delivery systems.
- Practice parameters should be individualized for athletes known to be at greater risk for heat injury.
- Players with acute gastrointestinal or febrile (feverish) illness should not be allowed to participate.
- Players should not use stimulants such as ephedrine, Ma Huang (Chinese ephedra), and high-dose caffeine that are often found in certain dietary supplements and “energy” drinks.

Monitoring Players During Practice

All players should be closely monitored for signs and symptoms of developing heat-related injury. Players who are not acclimated or aerobically fit, especially large linemen with excessive body fat, warrant closer and constant scrutiny for heat illness.

- Pre-practice daily body weight and urine-specific gravity or urine color can be used as indirect indicators of hydration status.
- Pre- and post-practice body weight measurements can help in determining how much fluid should be replaced before the next practice and to educate players regarding better fluid intake during practice.
- There should be enough coaches, staff, and athletic trainers to effectively monitor all athletes on the field for signs of heat illness.
- Changes in performance or personality might be early indications of developing heat injury.
- For any changes in player performance, personality, or well-being, including pale color, bright red flushing, dizziness, headache, excessive fatigue, fainting, vomiting, or complaints of feeling hot or cold during practice or conditioning drills, immediately stop practice for all affected players.
- In addition to all the above, prudent special

precautions for players with sickle-trait should include no day-one fitness runs and no timed miles or sustained sprints over 500 meters. Any cramping should be treated as sickling, until proved otherwise.

- Teams should use the “buddy” system (two players who play the same position are assigned to “keep an eye on” each other).
- If heat stroke is suspected, the player should be stripped of equipment and cooled in a tub of cold water or by using rapidly rotating ice water towels to the extremities, trunk, and head and ice packs in the armpits, groin, and neck areas, until emergency personnel can assume care and evacuate the athlete to the nearest emergency facility. Importantly, cooling should continue en route.
- If urine becomes tan or brown in the first hour up to several days after practice, players should immediately seek medical attention.
- Coaches and support staff should have annual education on heat-related illness reduction, identification, and first aid.

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