



FLUID BALANCE AND RECOVERY IN ADOLESCENT ICE HOCKEY PLAYERS

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Abstract

Hydration management in adolescent ice hockey requires more than a fixed daily water target. Repeated high-intensity shifts, protective equipment, individual sweat losses and limited time between bouts can influence fluid balance even in a cool arena. This narrative review summarizes practical prevention principles for adolescent players, coaches, parents and sports-health professionals. Evidence from position statements, pediatric beverage guidance and ice-hockey studies was considered. The literature supports reliable access to fluids, an individualized plan informed by the athlete's experience and, when appropriate, supervised pre- and post-training body-mass observations. Both inadequate replacement and excessive drinking can be harmful. Water is an appropriate routine beverage for most young athletes; carbohydrate-electrolyte drinks may have a limited role in prolonged, vigorous activity, while energy drinks containing caffeine or other stimulants are inappropriate for adolescents. The review proposes a simple before-during-after framework and emphasizes that hydration should be assessed alongside nutrition, recovery, health and training conditions. No new participant data are reported.

Keywords: Adolescent athletes; ice hockey; hydration; fluid balance; sweat rate; sports drinks; prevention.

1. Introduction

Ice hockey combines repeated accelerations, skating, rapid changes of direction and short recovery periods. Although the sport is played in a cool arena, intense exercise and protective equipment can promote sweating. In a study of elite Canadian junior male players, sweat rates during intense on-ice practice varied



and a substantial subgroup lost more than 1% of body mass despite access to fluids [1]. This finding illustrates why ambient cold alone should not be used to assume that an athlete's fluid needs are negligible.

Hydration advice for adolescents must also account for growth, maturation, individual health and the distinct risks of beverage products. Daily water needs vary with diet, climate, body size and activity; therefore, a universal volume cannot accurately prescribe every player's needs [2]. The practical goal is to support normal hydration and training safety without encouraging forced drinking or unnecessary stimulant and sugar intake.

2. Aim and Review Approach

This focused narrative review examines how adolescent ice-hockey programs can organize hydration education and day-to-day monitoring. It draws on the source manuscript topic, hockey-specific observational studies, a sports-medicine position statement, pediatric beverage recommendations and relevant reviews. The article does not present a new survey or report new participant data.

3. Why Hockey-Specific Hydration Planning Matters

Sweat losses vary between athletes and can change with exercise intensity, shift duration, equipment, arena conditions, acclimatization and access to drink breaks. Hockey studies in junior and adult players report meaningful fluid and sodium losses during practice or competition, but samples and protocols differ; these studies should not be converted into a single intake prescription for all adolescents [1,3,4]. A player who finishes a session with little net body-mass loss may still have started underhydrated, while a player who drinks excessively may increase the risk of exercise-associated hyponatremia [5].

Fatigue is also multifactorial. It can reflect training load, sleep, illness, inadequate energy intake, stress, conditioning or hydration, among other causes. A questionnaire association between reported drinking and fatigue cannot establish that low fluid intake caused fatigue. Teams should therefore avoid diagnosing dehydration from tiredness alone and consider patterns across several training sessions.



Table 1. Factors that shape hydration needs in adolescent hockey

Factor	Why it matters	Practical implication
Individual sweat loss	Sweat rate and sweat composition differ among athletes and sessions.	Avoid assigning one fixed fluid volume to every player; use supervised, repeated observations when appropriate.
Training intensity and duration	Repeated high-intensity efforts can increase sweat loss and carbohydrate use.	Make drinking opportunities predictable and match beverage choice to the session, not to marketing claims.
Protective equipment and rink conditions	Equipment and workload may increase thermal strain despite a cool arena.	Check comfort, symptoms and recovery; do not assume cold conditions eliminate fluid loss.
Age and development	Adolescents are still growing and may need adult support to recognize symptoms and make safe choices.	Coordinate advice among the player, caregiver, coach and qualified health professional.
Access and timing	Short breaks, limited bottle access or poorly planned practice transitions can restrict drinking.	Build brief drink opportunities into practice design and ensure safe, personal bottles are available.
Beverage type	Sports drinks, energy drinks and water are not interchangeable.	Use water as the routine default; reserve specialized sports drinks for a specific prolonged, vigorous exercise need; avoid energy drinks.

4. A practical before-during-after framework

4.1. Before training or competition

Players should arrive with normal daily hydration habits, regular meals and convenient access to drinking water. A small drink immediately before activity cannot reliably compensate for inadequate intake across the day. Coaches can normalize water breaks and remind athletes to bring a clean, labeled bottle. Medical conditions, medication use, recent illness and unusual symptoms should be discussed with a parent or qualified clinician rather than managed through a generic team rule.



4.2. During Activity

Provide opportunities to drink during breaks and let athletes respond to thirst, while avoiding pressure to consume a predetermined large volume. In long or especially vigorous sessions, a sports dietitian or sports-health professional may determine whether a carbohydrate-electrolyte drink is useful for an individual athlete. For most routine activity, water is sufficient. Fluid plans should never encourage drinking at a rate that exceeds losses; overconsumption of water or sports drinks can also be dangerous [5].

4.3. After Activity

After training, athletes should have access to water and a normal meal or snack that supports recovery. When an individualized assessment indicates substantial sweat loss, the athlete's broader recovery plan can address fluids and sodium through food and drink. Repeated body-mass checks, if used, should be voluntary, private, conducted with appropriate equipment and interpreted by trained personnel; they should not become a weight-control practice or a source of shame.

Table 2. Hydration actions across a hockey session

Stage	Core action	What to observe	Safety note
Before	Maintain usual fluid and meal routines; confirm bottle access and readiness.	Recent illness, unusually dark urine, headache, dizziness, or a marked change from the athlete's normal state.	Symptoms may have several causes; involve a parent or clinician when persistent or concerning.
During	Offer regular, practical drink breaks; allow access to water and individual choice.	Thirst, heat discomfort, performance changes, missed breaks and equipment-related strain.	Do not force a fixed volume or encourage rapid drinking beyond losses.
After	Rehydrate through normal drinking and recovery food; review the session if concerns recur.	Repeated pre/post session patterns, symptoms, and recovery before the next training session.	If estimating body-mass change, use trained supervision and protect privacy.
Across the season	Educate players and caregivers; review the plan when training load, climate or health changes.	Repeated fatigue complaints, cramps, nausea, dizziness, poor recovery or unusual drinking behavior.	Escalate severe or persistent symptoms for medical assessment; never treat energy drinks as hydration.



5. Choosing Beverages for Young Players

The 2025 healthy-beverage recommendations developed by leading nutrition, pediatric and cardiovascular organizations prioritize plain water and plain milk for children and adolescents, while advising against sugar-sweetened and stimulant-containing beverages [6]. For sport, pediatric guidance distinguishes sports drinks from energy drinks: a sports drink may have a limited role during prolonged vigorous activity when carbohydrate or electrolyte replacement is needed, but it is generally unnecessary for routine activity. Energy drinks are a different category and are inappropriate for children and adolescents because of caffeine and other stimulants [7,8].

The label “sports” or “performance” does not establish that a beverage is suitable for a minor. Coaches and parents should check ingredients, serving size and caffeine content, and should avoid using energy drinks to counter sleep deprivation or fatigue. Adequate sleep, regular meals, sensible training progression and clinical review of persistent tiredness are safer priorities.

Table 3. Beverage choices in youth hockey

Beverage	Typical role	Guidance for adolescent players
Plain water	Routine hydration before, during and after most practices.	Default choice; make it freely and conveniently available.
Carbohydrate-electrolyte sports drink	May be useful in selected prolonged, vigorous sessions or tournament conditions.	Use selectively for a clear exercise-related purpose and with adult or professional guidance; not as an everyday drink.
Energy drink or energy shot	Contains caffeine and/or other stimulant ingredients.	Avoid for adolescents; not an appropriate hydration or recovery product.
Soft drinks and sweetened beverages	Provide added sugars or sweeteners without a specific hydration advantage for sport.	Do not substitute for water; limit in the overall diet.
Milk and recovery foods	Can contribute to ordinary nutrition and recovery after activity.	Include according to dietary needs, tolerance and family guidance.



6. Monitoring Without Overmedicalizing

A simple approach combines education, observation and referral. Coaches can record whether water was available, whether breaks occurred and whether athletes repeatedly report symptoms. If the sports-health team chooses to estimate sweat rate or body-mass change, it should explain the purpose, use consistent conditions and avoid interpreting one session as a diagnosis. Urine color or specific gravity may provide contextual information but can be affected by timing, diet, supplements and other factors; no single field measure should be treated as definitive [5].

A team policy should define who responds to dizziness, confusion, fainting, vomiting, severe headache or collapse. These signs require stopping exercise and prompt assessment; suspected heat illness or other emergencies require urgent medical care. Hydration advice is preventive, but it is not a substitute for clinical evaluation.

7. Implications for Tashkent Youth Sport

For youth hockey programs in Tashkent, a feasible starting point is to make potable water accessible at practices, schedule breaks, discourage energy-drink use and provide short educational sessions for players, coaches and parents. Facilities should also consider travel and tournament schedules, outdoor heat before or after rink sessions, and the availability of safe drinking water. A monitoring record can focus on access, session conditions and recurring symptoms rather than claiming a universal daily fluid target.

Future local research should use a clearly defined sample, consistent age and sex reporting, a validated beverage and symptom questionnaire, and direct measurements where feasible. A prospective design could record pre- and post-session body mass, fluid intake, session duration and environmental conditions over multiple practices. Fatigue and performance outcomes should be defined in advance. Such a study would allow local recommendations to reflect the variability of young athletes rather than extrapolating from adult elite cohorts.



8. Limitations

This article is a narrative review and practical framework, not a systematic review, clinical guideline or original field study. Hockey-specific published evidence includes small or highly selected samples and often involves adult or elite junior athletes, limiting direct generalization to all 14–17-year-old players. Pediatric beverage guidance and sports-medicine recommendations should be applied with attention to individual health and current local regulations.

9. Conclusion

Safe hydration management for adolescent hockey players is individualized, practical and supervised. Programs should ensure routine access to water, create predictable drink breaks, avoid forced overconsumption, distinguish sports drinks from energy drinks and investigate repeated symptoms rather than assuming dehydration is the cause. Where training demands are prolonged or unusually intense, a qualified professional can help tailor fluid and fueling advice to the athlete. These steps support performance while protecting health during growth and development.

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