



# SAFETY

*Prevention of Common Ice Hockey Injuries*



REVISED 2/19



## OBJECTIVES

- To explain the important role that equipment plays in injury prevention
- To show how we can make facilities safer for ice hockey
- To explain the effect warm-ups, cool downs, and conditioning have on preventing injuries
- To explain to coaches how they can keep their players safe during drills
- To introduce coaches to injury prevention techniques that can be implemented over the course of a season

## INTRODUCTION

Hockey is a contact sport, although the contact in ice hockey has a different purpose than the contact in football and lacrosse. There will be collisions between individual players, players and sticks, players and the boards, or players and goal posts at all ages, in spite of the prohibition of body checking at the 12 and under and below age groups. In addition, the slippery ice surface is also conducive to injuries. Another source of injury is the puck. However, injuries do not have to be part of the game. As youth coaches and administrators, we must do everything possible to provide players with the opportunity to compete in an environment that is healthy and safe. We cannot eliminate all injuries and all contact from ice hockey without significantly altering the game. However, by examining the techniques for preventing injuries and the use of protective equipment, and by developing a plan to follow in case an injury occurs, we can decrease the number of injuries that occur and the severity of the injury.

*As a youth ice hockey coach, you are responsible for doing everything reasonable to provide participants the opportunity to compete in an environment that is healthy and safe.*

### Eliminating Injuries in Ice Hockey

There are four approaches to eliminating injuries in ice hockey:

1. proper coaching techniques
2. wearing protective equipment
3. playing by the rules
4. awareness by players, coaches, and parents of the possible injuries in ice hockey

## INJURY PREVENTION TECHNIQUES

### Classification of Sports

#### Contact/Collision Sports

|                |              |
|----------------|--------------|
| Boxing         | Martial Arts |
| Field Hockey   | Rodeo        |
| Football       | Rugby        |
| Ice Hockey     | Soccer       |
| Boys' Lacrosse | Wrestling    |

#### Limited Contact/Impact Sports

|              |                      |
|--------------|----------------------|
| Baseball     | Racquetball          |
| Basketball   | Softball             |
| Bicyling     | Figure Skating       |
| Cheerleading | Roller Skating       |
| Diving       | Field Events         |
| Equestrian   | Gymnastics           |
| Squash       | Girls' Lacrosse      |
| Volleyball   | Downhill Skiing      |
| Water Skiing | Cross Country Skiing |

#### Noncontact Sports

##### Strenuous

|                |          |
|----------------|----------|
| Running        | Shot Put |
| Swimming       | Discus   |
| Rowing         | Javelin  |
| Tennis         | Dancing  |
| Weight Lifting |          |

##### Moderately Strenuous

|           |              |
|-----------|--------------|
| Badminton | Table Tennis |
| Curling   | Hiking       |

##### Nonstrenuous

|         |         |
|---------|---------|
| Golf    | Riflery |
| Archery |         |

Source: *Pediatrics* 81 (1988): 737. American Academy of Pediatrics.



Coaches serve as the first line of defense in eliminating injuries in ice hockey. Coaches who emphasize proper warm-up and stretching exercises and cooling-down exercises will help to eliminate many muscle pulls and tendon injuries. Similarly, coaches who emphasize skill development will help players to avoid situations that lead to injuries. Players should be taught the types of body contact (body checking) that are legal, as well as how to perform proper body checking. But, possibly more important, players should also be trained how to protect themselves when they take a body check to minimize any injury that may occur.

Protective equipment is very important, and two of the most important pieces of protective equipment are the helmet and the full face shield. Blinding injuries have been eliminated, and the incidence of trauma to the head and face have been greatly reduced. Standards for helmets, face masks, and skate blades written by ASTM (American Society for Testing Materials) and other standards organizations have been accepted by HECC (Hockey Equipment Certification Council). USA Hockey (and the high school federation and the NCAA) has accepted some of these standards and recommends (and in some cases requires) that certified equipment be worn.

Playing rules are evaluated every two years in USA Hockey. Changes in playing rules may sometimes be dictated by the occurrence rate of specific injuries. An example of this is the increased penalties levied for hitting from behind, and the relationship of this type of penalty with the increased incidence of cervical spine fracture (about one-third of the players with paralyzing cervical [neck] spine fracture had been hit from behind).

Players and parents must be aware of what possible injuries can occur, and how the players themselves can lessen the occurrence of these type of injuries. Coaches, players, and parents should take time out before the season starts to watch video on the dangerous practice of hitting from behind and what the player can do to avoid or decrease the occurrence of injuries. This should be emphasized before the season starts as well as several times during the season at team meetings.

## **SEVERE INJURIES AND ILLNESSES**

### **Neck Fractures and Lacerations**

Fractures or broken bones are always a serious injury. It takes time for bones to mend. However, broken bones involving the spine can cause permanent damage such as paralysis. The neck bones (cervical vertebrae) are especially susceptible to injury, and there is no piece of equipment that will protect the player from this type of injury. This injury, which did not appear in hockey in any great numbers until the early 1980s, is very similar to the “spearing” injury in football, where a player puts his head down and essentially uses his head to tackle or block another player. It is somewhat different in ice hockey, in that the player is not trying to tackle or attack another player but is trying to protect himself from a collision with the boards or goal posts. Players must be instructed to protect themselves in an imminent collision with something other than their own heads. Helmets will not protect players from cervical spine fracture. Players going into the boards should try to get an arm up to take the brunt of the collision. If they can’t get an arm up, then they should extend their head (keep their head UP, rather than ducking or flexing their neck). It has been shown that one of the major mechanisms for neck fractures in football and ice hockey is when the neck is flexed (chin to the chest) causing the normal neck curve to be straightened out and allowing the full brunt of the collision to be absorbed by the cervical vertebrae resulting in a fracture. This is called axially loading, and fractures can occur with surprisingly little force (as little as a few miles per hour). In this case, teaching players the proper way to protect themselves is NOT to be equated with “an ounce of prevention is worth a pound of cure.” In this case it should be “an ounce of prevention is worth a TON of cure.” Broken bones can mend, but it is almost an impossible task to repair broken nerves and severed spinal cords.

It is important for players, parents, and coaches to understand that protective equipment will not protect the player from all injuries.

Neck guards (wrap-around neck protectors) will only protect against skate blade lacerations of the neck and will NOT protect against neck fractures or a blow to the neck from a puck, a stick or a goal post. Some youth leagues in the United States, and



the Canadian Hockey Association have made neck guards mandatory. Neck guards are NOT a substitute for the goalkeeper's hanging throat protectors that some leagues recommend or require.

### **Asthma**

Asthma is a lung disorder that is characterized by difficulty breathing. This difficulty is caused by constriction or narrowing of the bronchial or breathing tubes. An acute attack of difficulty breathing can be triggered by a number of things including certain pollens or allergens (such as might trigger hay fever), lung infections, cold air and plain exercise. Most cases of exercise-induced asthma begin in childhood.

There are a number of medications that are available to enable children and adults to participate in competitive sports. Asthma itself is no reason to avoid sports. The vast majority of asthmatics show no deterioration of lung function even after repeated attacks. If the player with asthma takes medication to prevent attacks during and sometimes before exercise, his or her capacity to exercise should be as great as the player without asthma. The International Olympic Committee has sanctioned several anti-asthma drugs for competition, including terbutaline sulfate and cromolyn sodium. The nebulizer (or spray) to dilate the bronchial tubes (include the following: albuterol sulfate, pirbuterol acetate, isotharine mesylate, terbutaline sulfate and metaproterenol sulfate). These medications are available with a doctor's prescription and can be used on the bench (if the parents and player's doctor agrees). If the player needs to use the medication more than two or three times during a game or practice, he may need to be seen by his doctor. However, there should not be any danger in using the medication as prescribed by the player's doctor.

Medication is essential to the asthmatic, but it has been demonstrated that physical training can dramatically improve the asthmatic's ability to resist attacks. Through a graduated exercise program, asthmatics can increase their heart-lung endurance considerably. Hockey, because of its short duration of high-speed exercise for 30 to 120 seconds and a work ratio of one to three or four, is actually better suited for asthmatics compared to soccer and

basketball, which require high-speed exercise for longer times.

### **Facilities**

Inspection of a rink for safety hazards is the responsibility of the adults in charge. For practice, the coach is responsible. For games, both the officials and coaches are responsible. Therefore, you or your assistant coach must inspect the facilities before permitting your players to participate in practices or games. Whoever is responsible for inspecting the facilities should arrive approximately 10 minutes before the players to carry out the inspection.

***If a safety hazard is present, it must be avoided by rescheduling, restricting the activity or removing the hazard, and informing the facility manager.***

There are a few hazards associated with ice rinks. These are: ice conditions, boards, plexiglass, goal posts, gates, improper lighting, and bad air quality due to an ice resurfacing machine's exhaust fumes. Safety hazards that are not easily rectified must be reported to the league program administrators and rink managers. If corrections are not made quickly, you should resubmit your concerns in writing.

Some of the things that coaches should be concerned about include:

- doors at the bench areas that do not fit flush with the boards, thereby leaving sharp edges exposed
- loose doors that may pop open when hit
- ruts or holes in the ice
- exposed edges on the goal cage
- uneven ice level at the sideboards
- proper testing for toxic gas fumes, specifically carbon monoxide (CO)

### **Management of Practices and Games**

Every physical activity that occurs during practices and games has some potential to result in an injury. Fortunately, in ice hockey, most practice and game activities have only a rare chance in resulting in an injury. Injuries that do occur are the result of interactions between the situation in which the activity occurs and the physical status of the player. In addition to having an influence over the equipment and facilities in reducing the risk of injuries, you



have a major influence over the physical activities of your players during practices and games. There are several steps you can take to properly manage the physical activities that occur at practices and games to reduce the rate and severity of the injuries. These steps include the following:

### Teaching Safety to Players

Whenever appropriate, inform your players about the potential risks of injury associated with performing certain ice hockey activities, and methods for avoiding injury. For example, hitting from behind is not only a penalty, but it can be extremely dangerous especially when the players are close to the boards. By informing your players of this danger and establishing a team rule that does not permit hitting from behind, you will reduce the risk of injury to all players.

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*The key to teaching safety to your players is to prudently interject safety tips in your instruction whenever appropriate.*

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### Warming Up

A warm-up at the beginning of your team's practices and before games provides several important benefits. These benefits are:

- increases the breathing rate, heart rate, and muscle temperature to exercise levels
- reduces the risks of muscle pulls and strains
- increases the shock-absorbing capabilities of the joints
- prepares players mentally for practices and games

Warm-up exercises, which include alternating stretching and motion exercises, should start in the dressing room (or any available space around the rink) and will provide several benefits. Before going on the ice, 10 minutes of stretching and light calisthenics followed by a skating warm-up of five to seven minutes should be performed.

Stretching should be done slowly (up to 30 seconds for each muscle group stretched) and to mild tension (DON'T OVERSTRETCH). The purpose of stretching is to minimize the risk of muscle strains and tendon pulls as well as to prepare the joints for greater shock

absorption. Visualization exercises can be done during stretching to enable the players to better prepare for games and for skills drills.

Calisthenics, such as jumping jacks or jogging in place, will increase the heart rate and breathing rate, as well as increase the blood flow to the muscles. Skating will also produce the same increase in heart and breathing rates.

Warm-ups should be done before skill-oriented drills.

### Cool Down

Muscles tend to tighten up during periods of inactivity following hard work. To minimize this muscle stiffness that usually follows a workout and the soreness that may become evident the following day, players should take time to adequately cool down at the end of practice. A gradual reduction of activity (the reversal of the warm-up procedure) facilitates the dissipation of waste products (such as lactic acid) associated with muscular activity. Letting the body cool off gradually will help to decrease muscle pain and to enable players to function better at high levels during the next practice.

### Teaching Appropriate Techniques

The instructions you provide during practices on how to execute the skills of ice hockey have an influence on the risks of injuries to your players as well as their opponents. Teach your players the proper ways to perform ice hockey techniques, and avoid any temptation to teach how to intentionally foul opponents. Keep in mind that:

First, an improper technique often results in a greater chance of injury to the performer than the correct execution. Acceptable techniques in sports usually evolve with safety as a concern.

Second, techniques involving intentional penalties should never be taught or condoned. Coaches who promote an atmosphere in which intentional violent acts are acceptable must be eliminated from all youth ice hockey programs. You should promote fair and safe play in practices and games with strict enforcement of the rules to encourage skill as the primary factor in determining the outcome of the game.



### Selecting Proper Drills

Drills that you select or design for your practices and the ways in which they are carried out have an influence on the risk of injuries for your players. Drills should be selected and designed with safety as a primary feature. Before implementing a new drill into your practice, several safety questions should be considered:

- Is the drill appropriate for the level of maturation of the players?
- Are the players sufficiently skilled to execute the drill properly?
- Are the players sufficiently strong enough to handle the physical demands of the drill?
- Are other, less risky drills available that achieve the same results?
- Can the drill be modified to make it less risky and yet achieve the desired result?

### Burn-Out

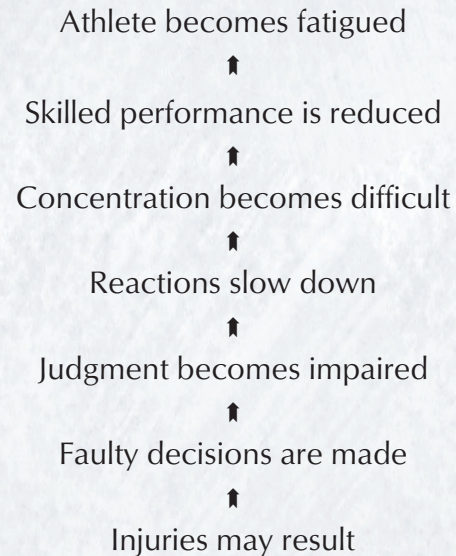
Coaches must be aware that players who engage in intense, frequent practices and games may need time off as the season wears on. It is possible to overtrain and predispose to, rather than prevent, injuries. Injuries caused by overtraining have grown to represent an increased portion of reported sports injuries. Some telltale signs of overtraining and burn-out include:

- sloppy execution of skills
- loss of enthusiasm
- depression
- higher incidence of injury
- longer time to recover from injury

Antidotes to overtraining and burn-out include time off from practice, shorter practices, alternating intense practices with lighter workouts, or any combination of these suggestions. Burn-out is not usually a problem when players are practicing two or three times a week, unless they are also: a) playing two or more games per week, b) playing on more than one

ice hockey team, or c) playing on a different sport team during the same season.

### Avoiding Contraindicated Exercises



**Figure 22-1.** How fatigue is linked to an increased potential for injuries and burn-out.

Over the past several years, researchers and physicians have identified a list of exercises that are commonly used by coaches but are potentially harmful to the body. These are called contraindicated exercises. This information has been slow in reaching coaches and their players. Table 22-1 contains a list of these exercises and how contraindicated exercises can be modified to eliminate their undesirable characteristics. Also included in Table 22-1 are substitute hockey exercises that accomplish the same purpose in a safer manner.



| Exercises                     | Muscles and Joints Affected                     | Problems  | Adaptations   | Hockey Exercises               |
|-------------------------------|---|---|---|--------------------------------|
| Toe touches                   | Hamstrings, lower back, knee                    | Puts excessive strain on lower back and overextends the knee joint  | Seated straight-leg stretch   | High road-low road             |
| Straight leg sit-ups          | Abdominals, lower back                          | Puts excessive strain on lower back throughout the exercise; strengthens muscles that contribute to pelvic tilt, thus promoting back problems | Abdominal curls: bent legs, arms across chest; curl 2/3 of the way up slowly  | Bent leg sit-ups with the ball |
| Straight leg lifts            | Abdominals, lower back                          | Same as straight leg sit-ups  | Bent leg abdominal curls  |                                |
| Deep squats                   | Quadriceps                                      | Opens knee and stretches ligaments  | Squat only until thigh is parallel to ground  | Jumping over the ball          |
| Hurdler's stretch             | Hamstring (straight leg); knee joint (bent leg) | Stretches the ligaments of the bent knee  | V-sit with legs spread 90° and both legs straight, or leave one leg straight and place the bottom of the foot of the bent leg up on the straight leg (next to knee) | High road-low road             |
| Standing one-leg quad stretch | Quadriceps, knee of bent leg                    | Stretches the ligaments of the bent knee  | Hold leg with opposite hand and extend the hip joint  |                                |

**Table 22-1.** *Contraindicated exercises.*

## POTENTIAL SAFETY HAZARDS

### Hydration-Water Intake

All athletes, including young athletes, lose water during practices and games. While water loss through sweating and exhaled air is greater in warm weather sports, water loss is also a major factor in cold weather sports such as ice hockey. Water loss or dehydration can develop into a life threatening situation. Many young athletes and coaches don't realize that thirst can be a very late indicator of dehydration, and many new coaches don't realize that drinking water during practices and games will NOT detract from the player's performance, and actually can improve it.

- Water must always be readily available during practices and games.
- Water can be taken freely without worry.
- Cold water is more rapidly ingested than warm water. Special electrolyte drinks (such as Gatorade) are not necessary. Plain water provides the same benefits for a lot less money.
- Sports medical experts do not recommend salt tablets before or during a game or practice.
- Players should drink a glass of water (two or three good swallows) every 15 minutes.
- Ideally, each player should have his own water bottle so that there would be less risk of spreading communicable diseases.



Athletes should avoid “energy drinks” that contain stimulants in addition to sugars and electrolytes. Although these drinks provide a short-term energy boost, they also accelerate consumption of fuel stores and deplete the energy that comes from carbohydrates, fats, proteins, hydration and rest.

### **Drug Abuse**

The statistics on drug abuse among children are frightening. Alcohol-related auto accidents are the leading cause of death among teens. One in 10 teens is dependent on drugs or alcohol. One in 10 male adolescents has used steroids.

One of the major solutions to the problem is to meet it head on. Coaches of young athletes have a unique opportunity to educate their players and parents about drug abuse. Drug abuse is dangerous and undesirable.

- Youth athletics can help in many ways to conquer the problem of drug abuse.
- Sports keep children busy.
- Sports can give the player a feeling of self worth.
- Sports can give the player a feeling of identification with a team.
- But drug abuse must also be discussed with coaches, players, and parents.
- Talk about alcohol and other drug abuse.
- Open a dialogue with the players about drugs and alcohol. Get the players to use peer pressure on teammates to refrain from taking alcohol and drugs.
- Enforce all training rules and school regulations pertaining to drugs and alcohol.

### **Blood-Borne Pathogens in Athletics**

The growing worldwide epidemic of AIDS has heightened concern from sport governing bodies about the risks of transmission of blood-borne pathogens between competing athletes and those closely associated with athletic competition. HIV (Human Immunodeficiency Virus—AIDS) and HBV (Hepatitis B Virus) have been found to be the most prevalent and lethal of infectious blood-borne agents. Transmissions of these agents have only been documented by sexual, percutaneous and perinatal exposure. However, there have been reports of cutaneous and mucosal transmission. Review of

studies of health care workers and individuals who lived with infected patients have identified that there is a 0.29% per exposure risk of seroconversion for percutaneous contact. Other routes are even at lower risk for seroconversion.

Very specific tests exist for identification of HIV and HBV. Testing for blood-borne pathogen infection should be administered to individuals thought to be exposed to infected people. Some sports are at higher risk because of the chance that blood will be exposed during competition. Although sports in general are a low risk activity for transmission, prevention guidelines are addressed for sports at greater risk and all activities where blood may be exposed. Post-exposure prophylaxis is recommended for individuals who have direct blood contact from others thought to be infected. Recommendations for follow-up testing and care are discussed.

### **Transmission of blood-borne pathogens between competing athletes is a rare and unusual event.**

#### **Specific Precautions for Sport**

Precautions can be undertaken during or prior to athletic competition to reduce the risk of HIV and HBV transmission, which include:

1. Voluntary testing for HIV and HBV is made available to all athletes in the greatest and moderate risk sports. Other athletes perceived to be at risk should also have testing available to them.
2. Educational information, including activities that place individuals at high risk because of lifestyle, geographic location or a specific sport, should be made available to participants and those deemed at risk associated with the athlete/athletic event (e.g., manager, coaches).
3. Gloves should be worn when contact with blood or other body fluids is anticipated. Gloves should also be worn for touching mucous membranes or non-intact skin (e.g., abrasion, dermatitis) of all athletes and for handling items or surfaces soiled with blood or body fluids. Gloves should be changed after contact with each athlete.
4. Hands and other skin surfaces should be washed immediately and thoroughly if contaminated with blood and other body



fluids. Hands should also be washed after gloves are removed. Athletes should shower immediately after competition.

5. Surfaces contaminated with blood or body fluid should be cleaned with a solution known to inactivate the virus after each game or more often as needed.
6. To minimize contact, emergency mouth-to-mouth resuscitation bags or other ventilation devices should be available for use in emergencies.
7. Soiled linen, towels, uniforms, etc., should be tagged and washed in hot water with a detergent that is known to inactivate HIV and HBV. When possible, disposable towels should be used and proper disposal procedures employed for soiled materials.
8. All athletes in the greatest risk sports should be required to wear mouth pieces, and it should be strongly recommended for athletes competing in moderate risk sports.
9. Spittoons or similar receptacles where bloody sputum or saliva may be spit should contain a solution known to inactivate the virus.
10. Games should be interrupted when an athlete has a wound in which a large amount of exposed blood is present to allow the blood flow to be stopped, the area cleaned and the athletes cleaned.
11. Athletes who have an open lesion, wound, dermatitis, etc., should cover them with a dressing that will prevent contamination from other sources.
12. Where possible, athletes and officials in the greatest risk sports should wear protective eyewear to reduce the possibility of blood or bloody body fluids entering the eyes.
13. Review all athletes' medical history to make sure that all routine vaccinations including tetanus and MMR (Measles, Mumps, Rubella) are up to date.

### **Disinfection of Surfaces and Equipment**

During practice and competition, surfaces and equipment become contaminated with blood and other body fluids. Because potentially dangerous microorganisms can survive on these contaminated surfaces for various periods of time, it is necessary

to apply disinfection procedures to interrupt cross-infection.

Solution of 5/25 percent sodium hypochlorite (household bleach) at a 1:10 dilution is recommended, but not required as the agent of choice for cleaning hard surfaces after all spills of blood or body fluids. These solutions should be prepared fresh, not older than 24 hours. It is not recommended to use sodium hypochlorite solutions on carpets or rugs. However, sanitary absorbent cleansers may be used on these items. Agents labeled as "hospital disinfectants" are also acceptable cleaning agents and will eliminate HIV and HBV. HIV and HBV are not resistant to many commonly used agents. Common agents that eradicate HIV and HBV include, but are not limited to: Lysol, hydrogen peroxide, betadine, glutaraldehyde, isopropyl alcohol, and Np-40 detergent. Chemical germicides registered with the Environmental Protection Agency (EPA) as sterilants are recommended for high-level disinfection.

The mechanics of scrubbing are much more important in eliminating organisms than the selected cleansing agent. The end result of scrubbing and rinsing should be the thorough removal of all contaminated materials.

The following simple precautions set forth the necessary elements for handling spills of blood or other body fluids:

1. Wear rubber medical gloves.
2. Contain the spill in the smallest area possible by absorbing the spill with paper towels.
3. If the spill is on a hard surface, decontaminate with a 5.25 percent (1:10 dilution) of hypochlorite bleach or a comparable solution.
4. Re-clean the area with fresh towels.
5. If the spill is on a rug or carpet, use a sanitary absorbent agent according to directions.
6. Place all soiled waste in a moisture resistant bag.
7. Wash your hands.
8. Trash and waste contaminated with blood or bloody body fluids should be regarded as potentially infectious and treated as biohazardous material.



9. Soiled linens and uniforms should be handled as little as possible to prevent microbial contamination of the air and persons handling the linen and uniforms. All soiled material should be bagged where it was used (double bagged if there is a chance of leakage) and transported to the laundry. If hot water is used, the soiled articles should be washed with detergent in water at least 71 degrees Celsius (160 degrees Fahrenheit) for 25 minutes. If low temperature ( $\leq 70$  degrees Celsius) laundry cycles are used, solutions known to inactivate the virus should be used.

### Frostbite

**Definition** — Superficial frostbite involves localized freezing of the skin and the superficial tissues below it. The nose, ears, toes, and fingers are especially prone to superficially but advances to deep tissues such as muscles and tendons.

#### FOR FROSTBITE, DO NOT...

- rub or massage frostbitten areas
- apply ice to frostbitten areas
- allow frostbitten tissue to refreeze

**Cause** — Exposure of body parts to cold, causing tissues to freeze and blood vessels to constrict.

**Symptoms** — Painful, itchy, burning, or tingling areas that may become numb as the frostbite worsens. These symptoms may recur when the affected areas are rewarmed.

**Signs** — First-degree frostbite — red or flushed skin that may turn white or gray. Second-degree frostbite — firm, white, and waxy skin. Blisters and purple tint to skin may appear when the area is rewarmed. Third-degree frostbite — blisters, bluish skin. The area feels very cold and stiff.

**First Aid** — Move the athlete to a warm area. Remove wet and cold clothing.

**First- and Second-Degree Frostbite** — Rewarm frostbitten areas by soaking them in clean, warm water (100 to 150 degrees Fahrenheit). Call the

athlete's parents or guardian to take the athlete to a physician.

**Third-Degree Frostbite** — Monitor the ABCs and cover the frostbitten areas with sterile gauze.

**Playing Status** — The athlete cannot return to activity until he or she is released by a physician.

### Prevention of Frostbite

1. Do not touch bare metal with bare skin. Cover all metal with cloth, tape, leather or a similar material.
2. Keep wiggling cold toes; as long as you can move them, you have not frozen your toes.
3. Beware of any localized skin numbness and protect it from further exposure.
4. Consider the air temperature, wind speed, and precipitation at the time of cold exposure. Consult a wind chill factor chart and determine a safe exposure time for training or competition.
5. Utilize information about weather conditions to select the proper layers of clothing. The inner layer ought to consist of a non-wettable fiber that transports sweat away from the skin surface. The outer layer should be windproof and waterproof, yet allow sweat to evaporate. When immobilized, or during low intensity exercise, a middle layer of clothing may be necessary for insulation. During high intensity exercise, the outer layer (or head covering) may be loosened or removed for brief periods to prevent excessive heat storage. It is important to keep clothing dry. Tight fitting clothing or shoes reduce blood flow to skin and increase the potential for peripheral cold injury.
6. Consider differences in metabolic heat production, especially during team competition. Top lines may produce large amounts of internal heat, while reserve players may suffer from hypothermia because they are inactive. Avoid situations in which athletes stand outdoors in wet clothing or footwear. Provide shelter from the wind and precipitation, whenever possible.



7. Supply athletes with liquids to avoid dehydration, just as you would in a hot environment.

## EQUIPMENT

### Guidelines for Selection and Fitting

1. **Helmet and Face Mask:** Obtain a helmet and mask that provide full facial protection and fits snugly on the head. All helmets and masks must be HECC-certified.
2. **Shoulder Pads:** The cap of the pad should cover the shoulder. Straps under the arms should attach securely. The front flap should come down far enough to cover the collarbone.
3. **Elbow Pads:** The straps should remain tight, providing a snug fit over the elbow. Some pads have adjustable straps, while some have only elastic straps. When straps become loose, the pad may slip off of the elbow, leaving it unprotected. There should be no space between the shoulder pads, elbow pads, and the hockey gloves.
4. **Shin Pads:** The knee is a primary area of concern for protection. The pad should cover the knee when the leg is straight and when it is bent. Pads should bend just below knee in order to conform to the bent leg.
5. **Ankle Guard:** Ankle guards are considered optional equipment. They are recommended for puck protection, however, particularly for defensemen. The protective part of the guard should cover the top five eyelets on the front of the skate and the inside and outside ankle bones.
6. **Gloves:** Gloves range in price from inexpensive to very expensive. They should have ample room for the fingers and thumb and must not be too snug in the wrist area. Be sure the cuff comes up far enough to adequately cover the wrist.
7. **Stick:** Sticks come in different lies. The most common lie is a five or six for skaters and a 12 to 13 for goalies. Lie refers to the angle between the blade of the stick and the shaft. The smaller the angle, the higher the lie. When choosing a stick, the entire bottom portion of the blade should be on the ice when the player assumes a ready position. If just the heel of the stick is touching, try a lower lie. If just the toe is touching, try a higher lie.  
Stick length can be determined by placing the front, bottom edge of the stick on the ice between the skates. The top of the shaft should touch the player's face between the chin and the tip of the nose. It should touch closer to the nose if the player is wearing shoes, not skates.
8. **Pants:** Pants are usually six sizes larger than the normal waist size. The top padded portion of the pants should cover the hips, lower ribs, and kidneys. The legs should be an inch or two above the knees, overlapping with the top of the knee pads. The area above the knee is often hit by the puck. Therefore, make sure there is no gap between the pants and knee pads. If a gap exists, loosen the suspenders and lower the pants or obtain others that fit appropriately.
9. **Skates:** Skates are the hockey player's most important piece of equipment. Without properly fitted skates, the young hockey player is at a tremendous disadvantage. Skates should not be bought several sizes too large so a player may "grow into them." Oversized skates will retard the skating development of the youngster. Skates should be slightly smaller (approximately one-half size) than the normal shoe size. They should fit snugly with just one pair of socks. Push the toes all the way to the front of the boot. At the heel area there should only be enough room for a pencil to fit between the heel and the back of the boot. When properly laced, players should not be able to lift their heels and their toes should be able to move. Rapidly growing youngsters may outgrow more than one pair of skates in a season. Look for good buys on used skates, but make sure they fit properly.
10. **Jock (Athletic Support):** Fitted according to waist size. It should fit snugly but not so tight as to be uncomfortable. The protective



cups come in men's and boys' sizes as well as women's and girls' sizes.

11. **Sports Bra:** Any girls should wear a sports bra when participating in vigorous activity. Sized by chest width and cup size as with a regular bra.
12. **Female Shoulder Pads:** For female players, a combination shoulder and chest protector combines shoulder pads with extra protection in the breast area.
13. **Mouthguard:** Use of an internal mouthguard reduces the risk of a brain concussion (from a blow to the jaw) and minimizes chances of chipping teeth should the lower jaw be struck.

### Goalkeeper's Equipment

14. **Goalkeepers Pads:** These are designed for blocking shots and protecting the front and side of the goalkeepers legs. A properly fitted set of goalkeeper pads extend from the toe of the skate to about four inches above the knee. The large vertical roll is always on the outside of each leg. Goalkeepers pads should always be left standing, so as to prevent flattening of the padding and "molding" as the pads dry out. The straps should be checked regularly for cuts or cracking, and replaced as needed. Any cuts in the leather of the pads should be repaired immediately.
15. **Goalkeepers Knee Pads:** These can afford additional protection when the goalkeeper is in such a position that the goalie pads do not cover the knee area.
16. **Goalkeepers Athletic Support:** Goalkeepers should wear the specially designed cup because of the extra padding and protection it provides.
17. **Goalkeepers Pants:** These have several additional protective pieces, and the padding is heavier than in the regular skater pants. The inner section, which protects the kidney, tail bone, groin, and waist area, also is fitted with heavier weight padding and protection.
18. **Belly Pad:** This is designed to protect the collar bone and the entire chest and abdominal areas. Ensure the pants are loose

enough around the waist to allow the belly pad to tuck into the pants comfortably.

19. **Goalkeepers Shoulder and Arm Pads:** These are designed to protect the shoulders and the arms right to the wrists. Many goalkeepers adjust or add padding to their arms and the front of their shoulders to suit their individual preferences. Pads that are too small (not reaching the cuff of the glove) leave the forearm open to injury.
20. **Catching Glove (Trapper):** This has a heavily padded protective cuff, which should overlap the protection of the arm pad.
21. **Blocker:** This is composed of a large protective fiber back pad, which should not be warped thus exposing the fingers. The glove should be pliable for easy gripping of the stick.
22. **Throat Protection:** Throat protection is vitally important for the goalkeeper. Three types of throat protection are predominantly used—hanging shield (attached to bottom of the face mask), hinge shield (attached to the helmet) and collar (worn around the neck). While the collar does offer greater protection from accidental skate cuts to the throat area, it does not provide as much protection from impact by the puck (shots) or sticks, as do the hinge or hanging shields.

### Care of Hockey Equipment

1. **Helmet:** Tighten all screws. Wash the interior with soap and a damp cloth before the season starts and several times during the season.
2. **Mouthguard:** Keep your mouthguard in its own case and rinse it thoroughly before and after each use.
3. **Shoulder Pads:** Check the straps for wear. Make sure the shoulder caps are securely attached.
4. **Elbow Pads:** Check the straps for wear and/or elastic fatigue.
5. **Shin Pads:** Check the knee area for cracks. Make sure the padding is not ripped or torn.
6. **Gloves:** Oil the leather, especially the palms. If the palms are worn, make sure the fingers cannot come out through the palm area. New palms may be necessary.



## Other Maintenance Tips

- After a game or practice, the equipment should be immediately hung up to dry. Leather should not be placed over any source of direct heat, as forced drying will cause cracking.
- After every game or practice, wipe off the skate blades and holders until they are completely dry to prevent rust.
- Leave skates unlaced with the tongues pulled down so that air can circulate inside and evaporate moisture. With most plastic skates the “liners” are removable, and should be taken out to dry.
- Check your blades for sharpness – a sharp skate will plane a fine white shaving off your thumbnail.
  - Nicks: Sometimes a nick in the blade can be removed with a small wet stone.
  - Bends: A bent or loose blade can often be detected by the squeaking noise it will make when gliding to a stop. Most skate sharpeners have a device for straightening blades.
- Make regular checks after each use to see that the rivets that attach the blade holders to the boot of your skates are secure.
- All equipment should be visually inspected at regular intervals. In most cases, a shoemaker can repair fabric tears or do patch stitching. In the case of cracked padding or plastic, a replacement part can usually be purchased.

## ENFORCE THE RULES

### Strict Enforcement of the Rules

Olympic hockey, college hockey, junior hockey, high school hockey, and youth hockey are all played according to different but similar playing rules that emphasize finesse rather than force. Protective equipment, such as helmets, are mandatory at all of the aforementioned levels of hockey. Full face masks are mandatory at all of the aforementioned except Olympic and junior hockey. Professional hockey has

undergone a philosophical change since 1988, with the emphasis on speed and finesse, but fighting and physical aggressiveness continues to be part of the professional game.

At the amateur level, we want to emphasize skill development, strategy, conditioning, and fair play rather than size, physical aggressiveness, or violence. It is important that coaches and officials work to strictly enforce the playing rules at all levels of hockey. The Zero Tolerance Program, implemented by USA Hockey in 1992, has helped to develop better understanding between players, coaches, officials, and parents. Coaches, officials, and league administrators should meet periodically during the season to review player behavior. Suggestions as to how to do a better job in controlling overaggressive play should be considered and discussed. Coaches, officials, parents, and players must remember that hockey is a game that involves contact, NOT violence. Strict enforcement of the playing rules will reduce injuries to players.

## SUMMARY

This chapter has focused on three areas in which you can exert an influence to reduce the potential number and severity of injuries in hockey. The first area involves your insistence that your players wear appropriate protective equipment. Avoiding safety hazards associated with the ice rinks is the second area. Management of practices and games is the third area. Proper management includes teaching your players safety, appropriate ice hockey techniques, and proper drills; and running practices with warming up, conditioning, and cooling down exercises; but exclude known contraindicated exercises. Safety and injury prevention should be a primary factor to consider in whatever plans you make for your youth ice hockey team. You will be more than compensated for the extra time and effort required to implement the suggestions found in this chapter by the comfort of knowing that you have done as much as you can to ensure that your players will have a safe season.