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Sports Injuries

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Preventing Musculoskeletal Sports Injuries in Youth: A Guide for Parents

Ms. Ramirez was sitting in her office when the phone rang. “Ms. Ramirez? Your son, Raoul, was injured during football practice. His knee may be badly hurt. He is going to County General. Please go to the emergency room right away.” She tried to remain composed, but could feel panic creeping through her body. With her breathing shallow and heart pounding, she dropped everything and tried to remember how to get to the hospital.

In the past, Raoul had only experienced scrapes and bruises, like most kids his age. Ms. Ramirez was hesitant to let him play a rough sport like football that requires considerable physical contact. But she chose not to keep him from playing his favorite sport. Now she was facing her child’s first major injury.

Childhood Sports Injuries: A Common and Serious Problem

Like Raoul, more than 38 million children and adolescents participate in organized sports in the United States each year. Still more participate in informal recreational activities. Although sports participation provides numerous physical and social benefits, it also has a downside: the risk of sports-related injuries. According to the Centers for Disease Control and Prevention, more than 2.6 million children 0 to 19 years old are treated in the emergency department each year for sports and recreation-related injuries.

These injuries are by far the most common cause of musculoskeletal injuries in children treated in emergency departments. They are also the single most common cause of injury-related primary care office visits.

The Most Common Sports-Related Injuries in Kids

Although sports injuries can range from scrapes and bruises to serious brain and spinal cord injuries, most fall somewhere between the two extremes. Here are some of the more common types of injuries.

Sprains and Strains

A sprain is an injury to a ligament, one of the bands of tough, fibrous tissue that connects two or more bones at a joint

and prevents excessive movement of the joint. An ankle sprain is the most common athletic injury.

A strain is an injury to either a muscle or a tendon. A muscle is a tissue composed of bundles of specialized cells that, when stimulated by nerve messages, contract and produce movement. A tendon is a tough, fibrous cord of tissue that connects muscle to bone. Muscles in any part of the body can be injured.

Growth Plate Injuries

In some sports accidents and injuries, the growth plate may be injured. The growth plate is the area of developing tissues at the end of the long bones in growing children and adolescents. When growth is complete, sometime during adolescence, the growth plate is replaced by solid bone. The long bones in the body include:

- the long bones of the hand and fingers (metacarpals and phalanges)
- both bones of the forearm (radius and ulna)
- the bone of the upper leg (femur)
- the lower leg bones (tibia and fibula)
- the foot bones (metatarsals and phalanges).

If any of these areas become injured, it's important to seek professional help from an orthopaedic surgeon, a doctor who specializes in bone injuries.

Repetitive Motion Injuries

Painful injuries such as stress fractures (a hairline fracture of the bone that has been subjected to repeated stress) and tendinitis (inflammation of a tendon) can occur from overuse of muscles and tendons. Some of these injuries don't always show up on x rays, but they do cause pain and discomfort. The injured area usually responds to rest, ice, compression, and elevation (RICE). Other treatments can include crutches, cast immobilization, and physical therapy.

Heat-Related Illnesses

Heat-related illnesses include:

- dehydration (deficit in body fluids)
- heat exhaustion (nausea, dizziness, weakness, headache, pale and moist skin, heavy perspiration, normal or low body temperature, weak pulse, dilated pupils, disorientation, and fainting spells)
- heat stroke (headache, dizziness, confusion, and hot dry skin, possibly leading to vascular collapse, coma, and death).

Heat injuries are always dangerous and can be fatal. Heat-related injuries are a particular problem for children because children perspire less than adults and require a higher core body temperature to trigger sweating. Playing rigorous sports in the heat requires close monitoring of both body and weather conditions. Fortunately, heat-related illnesses can be prevented.

Preventing and Treating Injuries

Injuries can happen to any child who plays sports, but there are some things that can help prevent and treat injuries.

Prevention

- Enroll your child in organized sports through schools, community clubs, and recreation areas that are properly maintained. Any organized team activity should demonstrate a commitment to injury prevention. Coaches should be trained in first aid and CPR, and should have a plan for responding to emergencies. Coaches should be well versed in the proper use of equipment, and should enforce rules on equipment use.
- Organized sports programs may have adults on staff who are certified athletic trainers. These individuals are

trained to prevent, recognize, and provide immediate care for athletic injuries.
- Make sure your child has—and consistently uses—proper gear for a particular sport. This may reduce the chances of being injured.
- Make warm-ups and cool-downs part of your child's routine before and after sports participation. Warm-up exercises make the body's tissues warmer and more flexible. Cool-down exercises loosen muscles that have tightened during exercise.
- Make sure your child has access to water or a sports drink while playing. Encourage him or her to drink frequently and stay properly hydrated. Remember to include sunscreen and a hat (when possible) to reduce the chance of sunburn, which is a type of injury to the skin. Sun protection may also decrease the chances of malignant melanoma—a potentially deadly skin cancer—or other skin cancers that can occur later in life.
- Learn and follow safety rules and suggestions for your child's particular sport. You'll find some more sport-specific safety suggestions below.

Treatment

- Treatment for sports-related injuries will vary by injury. But if your child suffers a soft tissue injury (such as a sprain or strain) or a bone injury, the best immediate treatment is easy to remember: RICE (rest, ice, compression, elevation) the injury. Get professional treatment if any injury is severe. A severe injury means having an obvious fracture or dislocation of a joint, prolonged swelling, or prolonged or severe pain.

Keep Kids Exercising

Luckily for Raoul, his injury wasn't serious. In a few weeks, he will be fully recovered and able to play again. Even though Raoul got hurt, it's important that he continue some type of regular exercise and sports involvement after the injury heals. Exercise may reduce his chances of obesity, which is becoming more common in children. It may also reduce his risk of diabetes, a disease that can be associated with a lack of exercise and poor eating habits. Exercise also helps him build social skills and provides him with a general sense of well-being. Sports participation is an important part of learning how to build team skills.

As a parent, it is important for you to encourage your children to be physically active. It's also important to match your child to the sport, and not push him or her too hard into an activity that he or she may not like or be capable of doing. Teach your children to follow the rules and to play it safe when they get involved in sports, so they'll spend more time having fun in the game and be less likely to be sidelined with an injury. You should be mindful of the risks associated with different sports and take important measures to reduce the chance of injury. For sport-specific suggestions, see the information below.

Sport-Specific Safety Information

Here are some winning ways to help prevent an injury from occurring, so you are less likely to get that alarming phone call like Raoul's mom did.

Basketball

- **Common injuries and locations:** sprains, strains, bruises, fractures, scrapes, dislocations, cuts, injuries to teeth, ankles, and knees. (Injury rates are higher in girls, especially for the anterior cruciate ligament or ACL, the wide ligament that limits rotation and forward movement of the shin bone.)
- **Safest playing with:** eye protection, elbow and knee pads, mouth guard, athletic supporters for males, proper shoes, water. If playing outdoors, wear sunscreen and, when possible, a hat.
- **Injury prevention:** strength training (particularly knees and shoulders), aerobics (exercises that develop the strength and endurance of heart and lungs), warm-up exercises, proper coaching, and use of safety equipment.

Track and Field

- **Common injuries:** strains, sprains, scrapes from falls.
- **Safest playing with:** proper shoes, athletic supporters for males, sunscreen, water.
- **Injury prevention:** proper conditioning and coaching.

Football

- **Common injuries and locations:** bruises, sprains, strains, pulled muscles, tears to soft tissues such as ligaments, broken bones, internal injures (bruised or damaged organs), concussions, back injuries, sunburn. Knees and ankles are the most common injury sites.
- **Safest playing with:** helmet, mouth guard, shoulder pads, athletic supporters for males, chest/rib pads, forearm, elbow, and thigh pads, shin guards, proper shoes, sunscreen, water.
- **Injury prevention:** proper use of safety equipment, warm-up exercises, proper coaching techniques and conditioning.

Baseball and Softball

- **Common injuries:** soft tissue strains, impact injuries that include fractures caused by sliding and being hit by a ball, sunburn.
- **Safest playing with:** batting helmet, shin guards, elbow guards, athletic supporters for males, mouth guard, sunscreen, cleats, hat, detachable, "breakaway bases" rather than traditional, stationary ones.
- **Injury prevention:** proper conditioning and warm-ups.

Soccer

- **Common injuries:** bruises, cuts and scrapes, headaches, sunburn.
- **Safest playing with:** shin guards, athletic supporters for males, cleats, sunscreen, water.
- **Injury prevention:** aerobic conditioning and warm-ups, and proper training in "heading" (that is, using the head to strike or make a play with the ball).

Gymnastics

- **Common injuries:** sprains and strains of soft tissues.
- **Safest playing with:** athletic supporters for males, safety harness, joint supports (such as neoprene wraps), water.
- **Injury prevention:** proper conditioning and warm-ups.

Treat Injuries with "RICE"

Rest: Reduce or stop using the injured area for at least 48 hours. If you have a leg injury, you may need to stay off of it completely.

Ice: Put an ice pack on the injured area for 20 minutes at a time, four to eight times per day. Use a cold pack, ice bag, or a plastic bag filled with crushed ice that has been wrapped in a towel.

Compression: Ask your child's doctor about elastics wraps, air casts, special boots, or splints that can be used to compress an injured ankle, knee, or wrist to reduce swelling.

Elevation: Keep the injured area elevated above the level of the heart to help decrease swelling. Use a pillow to help elevate an injured limb.

Play It Safe in the Heat

- Schedule regular fluid breaks during practice and games. Kids need to drink 8 ounces of fluid—preferably water—every 20 minutes, and more after playing.
- Have your child wear light-colored, "breathable" clothing.
- Make player substitutions more frequently in the heat.
- Use misting sprays on the body to keep cool.
- Know the signs of heat-related problems, including confusion; dilated pupils, dizziness, fainting; headache, heavy perspiration; nausea, pale and moist or hot, dry skin, weak pulse, and weakness. If your child experiences any combination of these symptoms or doesn't seem quite right, seek medical attention immediately.

Safety Tips for All Sports

- Be in proper physical condition to play the sport.
- Follow the rules of the sport.

- Wear appropriate protective gear (for example, shin guards for soccer, a hard-shell helmet when facing a baseball or softball pitcher, a helmet and body padding for ice hockey).
- Know how to use athletic equipment.
- Always warm up before playing.
- Avoid playing when very tired or in pain.
- Get a preseason physical examination.
- Make sure adequate water or other liquids are available to maintain proper hydration.

Adapted from *Play It Safe, a Guide to Safety for Young Athletes*, with permission of the American Academy of Orthopaedic Surgeons.

For More Information

For more information on sports injuries and prevention, contact:

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
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National Institutes of Health

1 AMS Circle
Bethesda, MD 20892-3675
Phone: 301-495-4484
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TTY: 301-565-2966
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Email: NIAMSinfo@mail.nih.gov
Website: http://www.niams.nih.gov

For more NIAMS information about knee problems, sprains and strains, growth plate injuries, and shoulder problems, visit the NIAMS website at: www.niams.nih.gov.

Other Useful Links

BAM! Body and Mind

Website: http://www.BAM.gov

President's Council on Physical Fitness, Sports & Nutrition

Website: http://www.fitness.gov

American Academy of Orthopaedic Surgeons (AAOS)

Website: http://www.aaos.org

American Academy of Pediatrics (AAP)

Website: http://www.aap.org

American College of Rheumatology

Website: http://www.rheumatology.org

American College of Sports Medicine

Website: http://www.acsm.org

American Medical Society for Sports Medicine (AMSSM)

Website: http://www.amssm.org

American Orthopaedic Society for Sports Medicine (AOSSM)

Website: http://www.sportsmed.org

American Physical Therapy Association (APTA)

Website: http://www.apta.org

Arthritis Foundation (AF)

Website: http://www.arthritis.org

National Athletic Trainers Association (NATA)

Website: http://www.nata.org

National Federation of State High School Associations (NFHS)

Website: http://www.nfhs.org/

SAFE KIDS Worldwide

Website: http://www.safekids.org

For Your Information

This publication contains information about medications used to treat the health condition discussed here. When this publication was developed, we included the most up-to-date (accurate) information available. Occasionally, new information on medication is released.

For updates and for any questions about any medications you are taking, please contact

U.S. Food and Drug Administration

Toll Free: 888–INFO–FDA (888–463–6332)
Website: http://www.fda.gov

For additional information on specific medications, visit Drugs@FDA at www.accessdata.fda.gov/scripts/cder/drugsatfda. Drugs@FDA is a searchable catalog of FDA-approved drug products.

Additional copies of this publication are available from:

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