KidSports:

Prevention and treatment of overuse injuries in children and adolescents

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In the first part of this article, we talked about the causes of sports overuse injuries in children and the nature of these injuries. In this article, we talk about what parents can do to prevent these injuries and what to do if they occur.

Prevention of overuse sports injuries

Parental expectations and conduct. Be realistic about your child's physical ability and help your child set realistic goals.[1] Letting young athletes set their own goals and their own pace is a good way to avoid overuse injury.[7] When children are trying to meet an expectation imposed by their friends, parents, or coaches, injuries occur more often.[7] Emphasize and praise improved performance, not winning.[1,12] Don't relive your own athletic past through your child.[1] Make sure your child knows that, win or lose, you love them and are not disappointed with their performance.[1]

Sports specialization. Children under 10 years should avoid specializing in one sport.[3,6,7,15] Kids who play different sports throughout the year are much less likely to suffer overuse injuries.[6] They should participate in a variety of activities with other children who are matched in age, ability and interest.[3] Experimentation with different sports allows children to develop fitness and motor skills, enjoy the social aspects of sport, and choose the sports they prefer.[2] Alternating sports that use the upper body, such as gymnastics, with sports that use the lower body, like soccer can help avoid overuse injuries by distributing the use of body parts.[7] Specialization should be saved until the late teens.[15] There are many outstanding athletes who didn't become involved in their specific sport until mid- to late-teens.[2]

Coaching. Find out about the coaches for your child's team.[1,2] What emergency plan do they have in case of injury? Find out what is to be expected of your child physically at practice and make sure that your child is in proper physical condition before participating.[1] Respect the coaches, but communicate openly with them if you disagree with their approach and discuss it with them.[1] Ask for a copy of the coach's conditioning plan and certification.[1,11] If coaches don't appear to have adequate training, parents can lobby local organizations to sponsor coaches' attendance at coaching and safety seminars (see Reference 10).[2] The Sport Safety Training Course, developed by the U.S. Olympic Committee and the American Red Cross, is a 6 1/2 hour course given in cities all over the country and costs just $25-$50.[6] It can be taken all in one day or in three 2-hour sessions, or any other arrangement that works for the coach. The program covers basic first-aid skills, CPR, how to prevent common sports injuries (minor sprains, cuts, bruises) and how to handle serious injuries until professional help arrives.[6]

Sports Equipment. Ensure that equipment fits properly and is up-to-date.[1] The condition of shoes is more important that the price or brand name.[15] It's often better to buy two $50 pairs of shoes

rather than one $100 pair so the shoes can be rotated to avoid rapid wear and deterioration.[15] Allow at least one finger's width from the end of the longest toe when buying shoes to allow for growth and make sure the shoes fit well.[15] Under the age of 10, an all-purpose shoe works well for most sports. Running shoes are not all-purpose shoes.[15] After age 10, sport-specific shoes can help improve performance and protect the feet. Some crossover between sporting shoes is usually OK, though again, running shoes should only be used for running.[15] Moving laterally in a running shoe is more difficult and presents greater risk of injury for children.[15]

Pre-participation screening. Pre-participation screening by a sports physician or chiropractor is recommended to determine whether your child is physically able to meet the demands of the sport chosen.[1,2,6] This alone could reduce overuse injuries by 50% according to the American College of Sports Medicine.[2] Children develop at different rates, so children of the same age may not be ready for the same level of competition. The American Academy of Pediatrics Committee on Sports Medicine has compiled a list of recommendations to assist physicians in deciding whether athletes with medical conditions should be allowed to play in particular sports.[8] This Committee has also compiled a guide for physicians, nurses and athletic trainers from elementary through high school on many topics including the increasing problems of anabolic steroid use, and specific problems unique to females.[9]

Developmental considerations. Sometimes parents introduce their children under the age of 5 to sports such as soccer, t-ball, martial arts.[5] Starting a child in sports too young does not benefit the child physically.[12,15] The American Academy of Pediatrics recommends that children begin participation in team sports no earlier than age 6, when they are able to understand the concept of teamwork. However, some children may not be ready physically or psychologically even at age 6.[12] Slower maturing children are often at greater risk of injury because they are competing with peers who are larger and physically more developed.[14] Late developing teens should avoid contact sports until their bodies have developed sufficiently.[12]

The following factors should be considered when deciding whether a child should participate in a particular sport:[12]

- age
- weight
- build
- physical development
- emotional development
- child's interest in the sport

Training and overtraining. Help your child get into shape before beginning a sport.[4] Joining them yourself as a positive role model is a great idea. A strength training program and aerobic exercise is an important component of any injury prevention program for children, just as for adults.[4,11]

Coaches and other adults should avoid setting rigid expectations about training intensity.[2] Generally, children shouldn't train more than 18-20 hours a week.[11] If a child is engaged in elite competition and is training more than 20 hours a week, a qualified sports doctor with expertise in young athletes should monitor the child to make sure that abnormalities in growth or maturation do not occur.[11]

A general guide is the 10% rule: Total training (intensity, frequency, duration, or any combination of these) should increase no more than 10% at a time.[2,11] For example, a young runner who runs 20 miles a week should run no more than 22 miles the next week, without

changing pace.[2,11] Training should accentuate general fitness and technique and avoid excessive volume.[2,11,15] Once good technique is mastered, power and speed can be introduced.[11] Tables 1, 2, and 3 at the end of this article for pitchers, swimmers, and runners, respectively, should be followed precisely in the training of young athletes.[3]

Given two children of the same age and ability, a sports program that overtaxes one child may be acceptable for another.[3,4] A good way to determine if your child is over training is to determine the discomfort or soreness after the activity. A pain rating of 2 or 3 on a scale of 1-10 is common. If pain exists during activity or if pain after activity is rated higher than 3, the activity may be too much, too fast, or too soon for that child.[3] In addition, be aware of the following signs of overtraining, a common precursor to overuse injury:[11]

- Slower times in distance sports
- Deterioration in execution of sports plays or routines
- Decreased ability to achieve training goals
- Lack of motivation to practice
- Getting tired easily
- Irritability and unwillingness to cooperate with teammates

Training should be carefully monitored during the adolescent growth spurt, possibly modifying training during this period, because growth-related factors can predispose children to injury.[1,2]

Heed pain and get treatment. If your child is injured during practice or a game, get proper medical attention quickly and go through proper rehabilitation if necessary.[1,4] Make sure your child knows not to play or train when they are in pain and to tell you if they have pain after playing.[1,6] Permanent damage can be avoided.[1] The primary symptom in overuse or stress injury is pain only during activity.[13] Pain can persist after activity and even during everyday activities with continued damage and more severe injuries.[13]

Treatment of overuse sports injuries

We are not discussing specific types of injury in this article because it is critical that diagnosis and treatment be performed by a sports physician or chiropractor who is knowledgeable about pediatric sports injuries.[12] All information regarding diagnosis, treatment and rehabilitation should be obtained and followed from this type of professional rather than attempting to self-diagnose or self-treat children. What may act like a simple sprain may actually be a growth plate injury.[12] In general, overuse injuries in children heal quickly.

Basically, the treatment will likely involve similar measures as for adults including PRICE: Protecting the injured area, Resting the injury, applying Ice, Compression, and Elevation. In addition, anti-inflammatories and other measures will likely be recommended during the acute phase of the injury. Gradual return to movement as the injury heals is usually suggested. Again, it is critical to follow the guidance of the physical or chiropractor in rehabilitation to avoid re-injury and potential damage to your child's development.

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REFERENCES:

1. "Children, Sports and Injuries: What Parents Should Know", ©2001-2004 National PTA, excerpted from the National Youth Sports Foundation for the Prevention of Athletic Injuries. http://www.pta.org/parentinvolvement/healthsafety/hs_sport_injuries.asp
2. "Overuse Injuries in Children and Adolscents", DiFiori, J.P., *The Physician and Sportsmedicine*, 27(1), January, 1999. ©1999 McGraw-Hill. http://www.physsportsmed.com/issues/01-99/difiori.htm
3. "Overuse Injuries", Koutures, C.G., ©2002 Healthcare South, http://www.healthcaresouth.com/pages/overuseinjuries.htm
4. "Sports Injuries, A Growing Problem in Kids", "Kid's Health" supplement in the October 18-20, 2002 weekend edition of USA Today, ©2002 American Academy of Pediatrics. http://www.aap.org/advocacy/releases/sportsinjury.htm
5. "A Comprehensive Study of Sports Injuries in the U.S.", ©American Sports Data, Inc., http://www.americansportsdata.com/sports_injury1.asp
6. "Overuse Injuries: The New Scourge of Kids Sports", Micheli, L.J., SportsParents, http://www.sikids.com/sportsparents2/medical/overuse.html
7. "Overuse Injuries", HealthWeek, a production of Newsweek Productions, Inc. in association with Maryland Public Television. http://www.pbs.org/healthweek/featurep2_322.htm
8. "Preparticipation Physical Evaluation", American Academy of Pediatrics, P.O. Box 927, Elk Grove Village, IL 60009-0927.
9. "Sports Medicine: Health Care for Young Athletes", American Academy of Pediatrics, P.O. Box 927, Elk Grove Village, IL 60009-0927.
10. Sport Safety Training Course, Contact your local Red Cross chapter.
11. Boston Children's Hospital Sports Medicine Division Fact Sheet, http://web1.tch.harvard.edu/cfapps/sportsmed/factSheet_overtraining.pdf
12. "Child Health A to Z: Sports Injury Prevention", ©2001 Children's Hospital Boston. http://www.childrenshospital.org/cfapps/A2ZtopicDisplay.cfm?Topic=Overuse%20Injuries
13. "Recognizing Upper-Extremity Stress Lesions", Cervoni, T.D., Martire, J.R., Curl, L.A., and McFarland, E.G. The Physicial and Sportsmedicine, 25(8), August 1997, ©1997 McGraw Hill. http://www.physsportsmed.com/issues/1997/08aug/cervoni.htm
14. "Children and Sports Injuries" ©1992 Foundation for Chiropractic Education and Research, http://www.hands-on-health.com/children.htm
15. "Your Podiatric Physician Talks About Sports and Your Children's Feet", American Podiatric Medical Association in cooperation with the American Academy of Podiatric Sports Medicine. http://www.apma.org/sports/children.html

TABLE 1
Pitching recommendations for young baseball players[3]

Age (yr)	Pitches permitted
8-10	52 +/-15
11-12	68 +/-18
13-14	76 +/-16
15-16	91 +/-16
17-18	106 +/-16

TABLE 2
Progressive development of the swimmer[3]

Age (yr)	Frequency and duration of swim	Development
5-7	2 sessions/wk of 20-60 min	Introduce basic water skills and stroke technique
8-9	2 or 3 sessions/wk of 45-60 min	Develop more advanced skills and technique
10-12	3-5 sessions/wk of 60-90 min	Introduce competition, improve technique
13-16	5-9 sessions/wk of 90-120 min	Maximize development of all

TABLE 3
Recommended maximum running distances per day[3]

Age (yr)	Distance (km)
<9	3
9-11	5
12-14	10
15-16	21.1 (half-marathon)
17	30
18	42.2 (marathon)