



## Child Runners Are Not Just Small Adult Runners! by Richard Beauchamp, M.D.

Fellow runners often asked me: “When can my son/daughter run in a road race?”

The answer to this question involves many factors. Probably the most important issue is the age and maturity of the child. Child runners are not just small adult runners! Because they are still growing, children have a unique anatomical and psychological make-up. Adolescent children are in the end phase of their growth periods (around ages 12 to 14 for girls and 15 to 17 for boys). Pre-adolescent children are younger than that. Children are most susceptible to athletic injuries during their period of maximum growth velocity.

Sports injuries to an adolescent and preadolescent child can involve many anatomical areas.

### Bony Injuries:

Bones grow through their growth centres. These are usually located at the ends of long bones. In the leg the growth centre is around the knee (70% of the growth of the leg is from here), the ankle and the hip joint. These growth centres are comprised mainly of cartilage rather than bone and thus are weaker than bone (see Figure 1). This makes them more susceptible to shearing forces and fractures (breaks). These growth centres are especially vulnerable to overuse and repetitive injuries. In some situations, although rare, injuries to the growth centre can result in a growth disturbance leading to the development of a leg length difference or angulation of the leg causing it to grow crooked. Children can also develop stress fractures, as adults do, in areas not associated with growth centres.

### Soft Tissue Injuries:

Ligaments attach bones to bones across a joint and provide stability to that joint. The anterior cruciate ligament is a ligament that joins the thigh bone (femur) to the shank (tibia). We have all heard of athletes damaging their career with an ACL tear, which necessitated surgical repair. While ACL injuries in children are rare they nonetheless can occur. Both with the advent of MRI and with more children running and participating in sports, more children are being diagnosed with this condition than before.

Tendons attach muscles to bones. They are the anchors for the muscles allowing them to tighten and relax thereby providing movement to the adjacent joint. E.g., the achilles tendon attaches



### About Richard

Richard Beauchamp is a runner as well as an orthopedic surgeon. His running career has spanned about 10 years and involved seven marathons. His orthopedic surgery career extends over 25 years. He is the medical director of the Shriner’s Gait Lab at the Sunny Hill Health Centre in Vancouver and a clinical professor in the Department of Orthopaedics at the University of British Columbia. He runs out of the Alma Running Room along with his wife and “cookie maker” Dorothy.



the calf muscle to the heel and allows the foot to push down when a runner pushes off with each step. Tendons can be the source of some inflammatory events (e.g., patellar tendonitis) or from some injury or degeneration (e.g., Achilles tendonosis).

**Other Factors:**

Children have a much more sensitive circulation system. Both the relative size of the child to their body mass as well as the circulation volume of a child renders them much more susceptible to the effects of hydration problems. Both over- and under hydration can occur. Children have much poorer control of their water loss through sweating than adults do and may suffer more sudden onset of these conditions particularly in adverse weather, both hot and cold.

Psychological factors play a bigger role in children's involvement in sports than previously thought. Too early, too aggressive introduction to sports, including running, has been associated with a "burn-out phenomenon" that may discourage the then-older child or young adult from re-pursuing further running activities.

The American Academy Of Pediatrics has identified several time periods that may be associated with the onset of injuries in children:

- (1) in the first four to six months of the onset of a running program
- (2) upon returning to running following an injury
- (3) when running quantity (distance) of running is increased
- (4) when running quality (speed, terrain) of running is increased.

I believe we have all heard of these times in dealing with adult runners but obviously they must also be considered when dealing with a young runner.

The American Academy of Pediatrics has also established some guidelines for those involved with training and coaching children in sports:

- (1) Encourage athletes to strive to have at least one to two days off per week from competitive athletics, sport-specific training and competitive practice (sprinting) to allow them to recover both physically and psychologically.

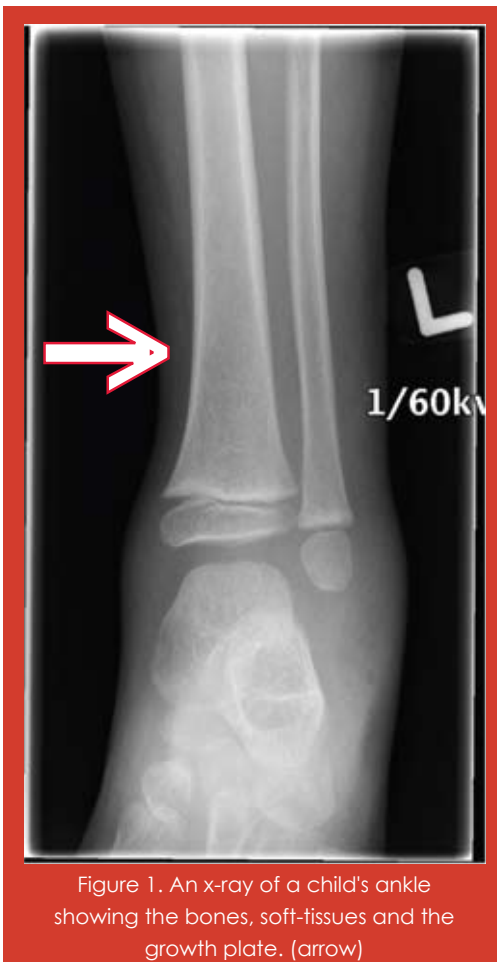


Figure 1. An x-ray of a child's ankle showing the bones, soft-tissues and the growth plate. (arrow)

- (2) Advise athletes that the weekly training time, number of repetitions or total distance should not increase by more than 10% each week (e.g., increase total running mileage by two miles if currently running a total of 20 miles per week).
- (3) Encourage the athlete to take at least two to three months away from a specific sport during the year.
- (4) Emphasize that the focus of sports participation should be on fun, skill acquisition, safety, sportsmanship and socializing.
- (5) If the athlete complains of nonspecific muscle or joint problems, fatigue, or poor academic performance, be alert for possible burnout. Questions pertaining to sport motivation may be appropriate.

To answer the opening question regarding the participation in a road race for children, I think it could be wisely said not to attempt "too much, too soon or too quickly." But can a child run a road race or even a marathon? Expert opinion among the International

Marathon Medical Directors Association is split. There have been thousands of finishers under 18 years of age in the Los Angeles Marathon, but these runners have been in an organized program for youth running. There were nearly 300 young runners at the Twin Cities Marathon—the youngest being seven years of age! So clearly young runners have been participating. Perhaps it is a program that should be studied more actively.

To this end, the Association of International Marathon and Distance Races began a children's running series in 2006. These have included the Sahara Marathon, Kathmandu Peace Run in Nepal and the Great Ethiopian Run in Addis Ababa. Their goal is to promote fitness and health to young people throughout the world. The most recent AIMS Children's Series was in Delhi, India, in October 2011.

In the BMO Vancouver International Marathon in May 2012, minors under 19 years of age are allowed to participate only if a waiver is signed by the child's parent or guardian. Children must be over 16 years to run in the marathon and over 12 years to run in the half-marathon.

The knee jerk reaction by some race directors and medical advisors historically has been to NOT allow adolescents and pre-adolescents to participate in organized road races, including marathons and beyond. But why? I have rarely seen any injuries in children as a result of distance running. On the other hand, I have seen many injuries incurred in contact sports, i.e., hockey, as well as overuse, repetitive injuries in gymnastics.

To date, there is no scientifically proven distance or duration recommendations for young runners. Hopefully, in the future, properly researched and conducted training programs will be established to allow and encourage youth participation in organized races. These programs should encompass fluid and electrolyte balance, proper graduated increase in mileage, injury prevention, flexibility, health, nutrition and, most importantly, enjoyment. In general, parents of children who wish to participate should encourage the sport but with some cautions, like all training programs, adults and others included, about not doing "too much, too soon, too quickly"! 🍌