



FICS sport and pediatric

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17.06.23 Paris



HELPING ATHLETES ACHIEVE THEIR OPTIMAL PERFORMANCE NATURALLY

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Age group

The youth athlete age group go from 5 to 18 / 22 years old

The highest sport participation are between 9 to 11 years old

The ATA [14] considers 18 years as the cutoff; on the other hand the American Academy of Pediatrics identifies the upper age limit as 21 years [15]. ...Nov 16, 2022

According to the International Olympic Committee, "there is no specific age limit for taking part in the Olympic Games." Rather, the age restrictions depend on each International Sports Federation and the rules of each sport. Aug 5, 2021



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Sport injury in youth athlete

They are far more frequent than you might imagine

Between 5 to 24 years of age, its roughly 65% of all sport related injury in US

'Body regions injured while engaging in sports and recreation activities included the lower extremity (42.0%), upper extremity (30.3%), and head and neck (16.4%)'

<https://www.cdc.gov/nchs/data/nhsr/nhsr099.pdf>

Female versus Male

Pediatric sports injuries: a comparison of males versus females

Overall, female athletes had a higher percentage of overuse injuries (62.5%) compared with traumatic injuries (37.5%); the opposite was seen in male athletes (41.9% vs. 58.2%, respectively; $P < .001$).

Sports injuries in young males and females differed by injury type, diagnosis, and body area. These results may be related to the referral patterns unique to the division of the hospital, including a high number of female dancers. Further investigation is required to better understand the injury risk in pediatric male and female athletes.

<https://pubmed.ncbi.nlm.nih.gov/24567251/>

The challenge of being a young athlete

We are facing new challenge in sport with the post covid period, the young athlete where left alone and without training for a long time , their condition and development have been challenged.

They need more than ever better care and follow up to be able to practice in a safe and enjoyable way.

https://www.instagram.com/reel/CVxqT33swlu/?utm_source=ig_web_copy_link&igshid=MzRIODBiNWFIZA==

Evaluation of a young athlete

- Normal assessment of a patient
- Growth chart
- Neuro development (primitive reflex, core vestibular)
- Bone growth and ossification point
- Diet
- Psychology
- Common injury

Development blueprint

Tone and Asymmetry/ROM/Flexibility

- Primitive reflexes
- Postural Core Stability
- Gross motor strength
- Dominance
- Autonomic/Social Development

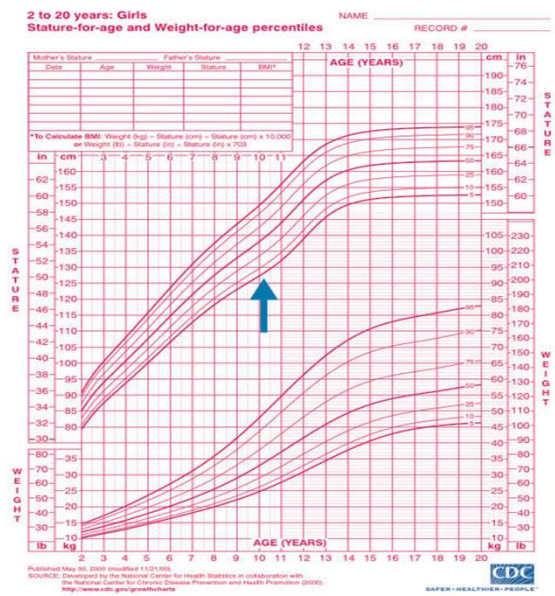
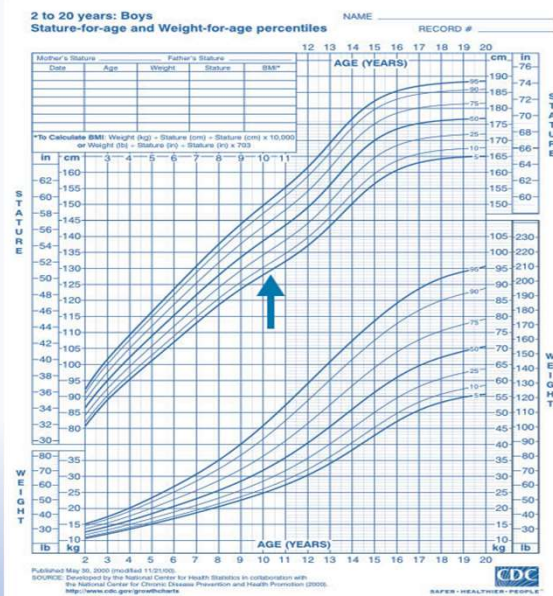
- Vestibular Otolith Head/Body stability
- Vestibular Semicircular Canals/Head/Eye stability
- Optokinetic reflexive
- Oculomotor Gaze Stability
- Frontal Lobe control of, Movement, Vision, Autonomic/Social) engagement



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Growth chart (be careful can be different according the ethnic or country of origin)



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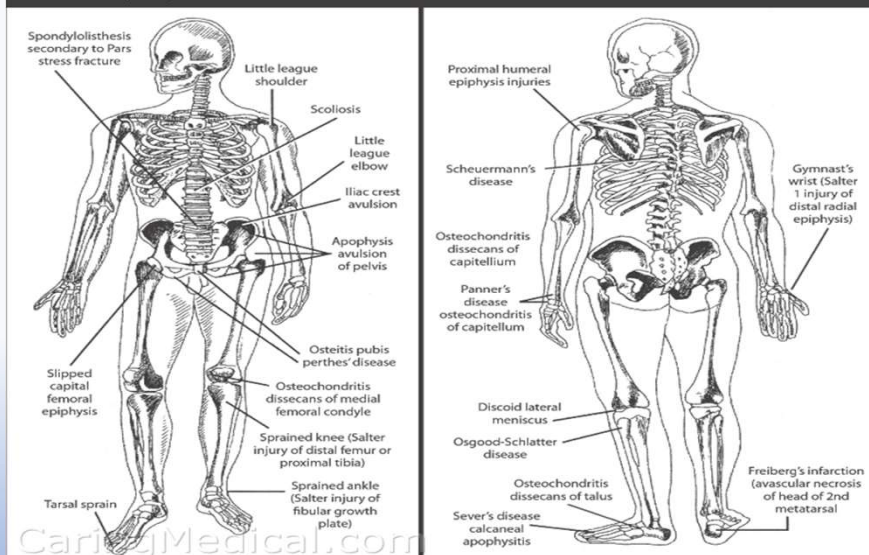
Growth Plates

Growth plates close near the end of puberty. For girls, this usually is when they're 13–15; for boys, it's when they're 15–17.

While growth plates can be found in long bones throughout the body The most common growth plate injuries occur in the long finger bones and the outer bone of the forearm near the wrist.

Other common growth plates fractures occur around the elbow, the knee, and the ankle.

Common sites of musculoskeletal injuries in adolescent athletes. Many of these injuries occur around growth plates and are called osteochondroses and include apophyseal and epiphyseal conditions. Prolotherapy is a great alternative for young athletes who have these conditions.



Brain hemisphericity

During the child development the brain have to lateralize some function so you can be right handed or left hand, the process increase between 5 y to 20 y old it's important for the right development that the body is lateralize only one side

Right ear

Right hand

Right foot

Right eye

or Left

Core muscles and stabilization

The core muscles function indicate a correct function of the brain and the coordination, an impairment of their straight can cause health and mental problem of the Youth

Easy way to test it

- curl up
- bridge
- plank
- side plank

Curl up test

Have the child lie on a flat cushioned with knees bent and feet about 12 inches from his backside.

Put your hands over his feet for support.

- Ask him to cross his arms and place his palms on his shoulder.
- Now ask him to raise his trunk and curl up until his elbows touch his highs.
- Ask him to lay back down so the shoulder blades touch the floor, for one curl up.

Continue to do this for one minute while counting aloud. The goal is to do as many as possible fluidly without error in one minute.

Curl Ups level 1

Boys and Girls

- 4 to 7 years old goal is 15 curl ups
- 8 to 12 years old goal is 25 curl ups
- 13 to 17 years old goal is 35 curl ups

Curls up level 2

Boys

- 4 to 7 years old goal is 25 curl ups
- 8 to 12 years old goal is 35 curl ups
- 12 to 17 years old goal is 45 curl ups

Girls

- 4 to 7 years old goal is 25 curl ups
- 8 to 12 years old goal is 35 curl ups
- 13 to 17 years old goal is 40 curl ups

Curl up level 3

Boys

- 4 to 7 years old goal is 35 curl ups
- 8 to 12 years old goal is 45 curl ups
- 13 to 17 years old goal is 55 curl ups

Girls

- 4 to 7 years old goal is 35 curl ups
- 8 to 12 years old goal is 45 curl ups
- 13 to 17 years old goal is 50 curl ups

(source NSCA's essentials of personal training)

Supine bridge core test

- Test 1

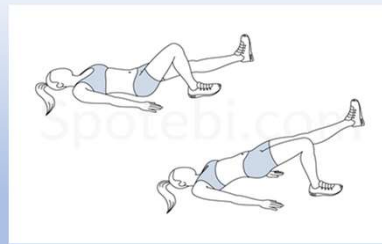
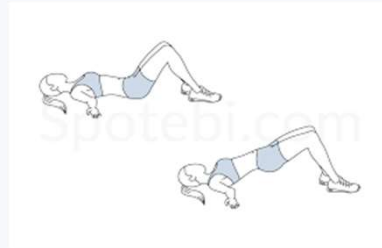
The child must hold for 1 min

- Test 2 (no stabilization with the arms)

The child must hold for 1 min

- Test 3

30 seconds both legs



Primitive's reflexes

- Babinski
- Rooting
- Palmer
- Moro
- Asymmetric tonic neck reflex
- Symmetric neck reflex
- Spinal Galant

Reflex	Purpose	Age Appears	Age Integrates	Signs of Retention
Moro Reflex	Fight or Flight reaction, sympathetic nervous system response	Birth	2-4 months	Hypersensitivity to one or more sensory systems, vestibular deficits (motion sickness, poor coordination and balance), oculomotor and visual-perceptual problems, poor pupillary reactions to light, hypersensitivity to auditory input, allergies and lowered immunity, adverse drug reactions, poor stamina, poor adaptability, reactive hypoglycemia
Rooting Reflex	Autonomic Response to locate food and breast	Birth	3-4 months	Anterior tongue tie, thumb sucking, oral hypersensitivity, poor eating, speech and articulation problems, swallowing and chewing deficits
Palmar Grasp Reflex	Autonomic Flexion of the fingers to grab when the palm is stimulated	Birth	3-6 months	Poor manual dexterity, deficits with pencil grip, poor visual coordination, poor posture during handwriting, poor writing skills, correlated speech and hand movements, dysfunction of the tactile and proprioceptive sensory systems
Asymmetric Tonic Neck Reflex (ATNR)	Assists with movement through the birth canal at delivery and is important for cross pattern movements	Birth	6 months	Decrease hand eye coordination, poor handwriting, uncoordinated gait, poor balance, poor visual motor skills and tracking, problems with math and reading, difficulty crossing midline
Spinal Galant Reflex	Important during the birthing process and helps to facilitate movement of the hips during descending the birthing canal	Birth	3-9 months	Postural issues like scoliosis, misaligned or rotated pelvis, and pain in lower back, bedwetting after potty training, hyperactivity, attention and concentration issues, decreased endurance, chronic digestive issues, decreased lower body coordination, pain and tension in legs
Tonic Labyrinthine Reflex (TLR)	Foundational for postural stability for large muscle groups	In Utero	3 ½ years	Decreased balance, poor spatial awareness, toe walking, hypermobility of joints, weak muscles, poor posture, motion sickness, poor ability to climb, atypical head position (forward or to side)
Landau Reflex	Necessary for postural development	4-5 months	1 year	Poor posture and muscle tone, summersaults are challenging, poor coordination for activities that require upper body and lower body to move together, delayed motor development
Symmetric Tonic Neck Reflex (STNR)	Foundational for crawling	6-9 months	9-11 months	Poor posture in standing, poor seated posture, ape-like walk, low muscle tone, W sitting position common, sloppy/messy eater, poor hand/eye coordination

Babinski reflex

Age integrate
it's the last one to go around 12 months

Purpose
coincide with walking
can returned after stroke or tumor

Sign of retention
toe walker
poor balance

The most common symptoms

- Anxiety
- Motion sickness/car sickness
- Clumsy
- Poor hand-eye coordination
- Poor right / left discrimination after the age of 8
- Challenges with reading at age level
- Poor handwriting at age level
- Low muscle tone
- Decreased coordination with sporting activities
- Challenges with sequencing
- W-sitting and/or toe walking
- Challenges sitting still - ADHD symptoms
- Bedwetting past the age of 7
- Poor short-term memory
- Hypersensitivity to sound, touch, movement
- Speech and articulation challenges
- Picky eating and/or oral motor challenges
- Challenges with fine motor tasks at age level
- Diagnosis of Autism
- Early Diagnosis of ADHD

Video
ASTNR
STNR
Galant



Video
Moro
ASTNR
STNR



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Video Babinski
Palmer grasp



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Diet recommendation

Benefits	Good sources	
Carbohydrates	<ul style="list-style-type: none"> Provide the glucose athletes need for energy. 	<ul style="list-style-type: none"> Whole grains, vegetables, fruits, milk and yogurt.
Protein	<ul style="list-style-type: none"> Builds and repairs muscle, hair, nails and skin. Also helps maintain glucose when doing physical activity for long periods of time. 	<ul style="list-style-type: none"> Lean meat and poultry, fish, eggs, dairy products, beans and nuts.
Fats	<ul style="list-style-type: none"> Help the body absorb vitamins A, D, E, K. Protect the body's organs and provide insulation. Is a source of energy. 	<ul style="list-style-type: none"> Lean meat and poultry, fish, nuts, seeds, dairy products, and olive and canola oils. Fat from chips, fried foods and baked goods should be minimal.

Recommended daily allowance

Calcium

- 1000 mg/day for 4 to 8 years of age
- 1300 mg/day for 9 to 18 years of age
- Calcium helps build strong bones to resist breaking and stress fractures.
- Good sources include milk, yogurt, cheese, broccoli, spinach, and fortified grain products.

Vitamin D

- 600 IU/day for 4 to 18 years of age
- Helps the body absorb calcium.
- Good sources include fortified foods such as milk, and safe sun exposure. Dairy products other than milk, such as yogurt, do not contain vitamin D.

Iron

- 8 mg/day for 9 to 13 years of age
- 11 mg/day for boys and 15 mg/day for girls 14 to 18 years of age
- Iron helps carry oxygen to all the different parts of the body that need it.
- Teens need more iron for healthy growth, increased amounts of blood and muscle.
- Good sources include eggs, leafy green vegetables, fortified whole grains and lean meat

Magnesium

8 mg/day per kilogram

Source: Dietary reference intakes: **The essential guide to nutrient requirements**; Institute of Medicine: **Dietary reference intakes for calcium and vitamin D**; Health Canada, Dietary reference intakes

Mental health

Physical activity have a positive effect on the young athlete but watch out for burnout, stress and anxiety. <https://bjsm.bmj.com/content/54/4/216>

BEST PRACTICE FOR YOUTH SPORT BY ROBIN VEALEY & MELISSA CHASE

overload factor

- overstress
- overtraining

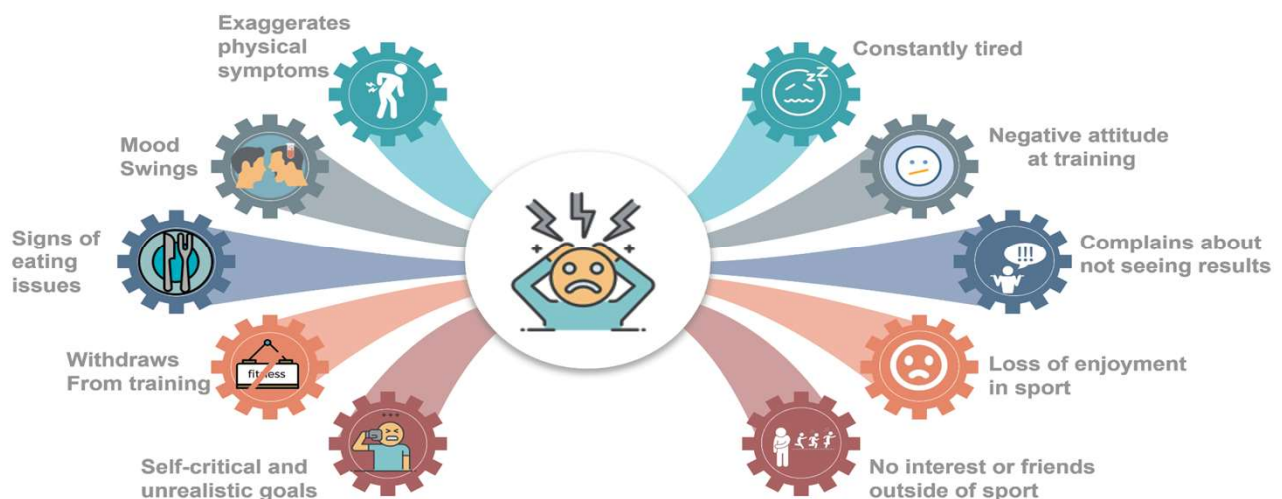
social climate

- pressure from the parent and /or coach
- feeling trap in sport
- lack of personal control

personality factor

- anxiety
- weak coping skill
- negative perfectionism
- obsessive passion
- personality disorder

Signs of athlete burnout

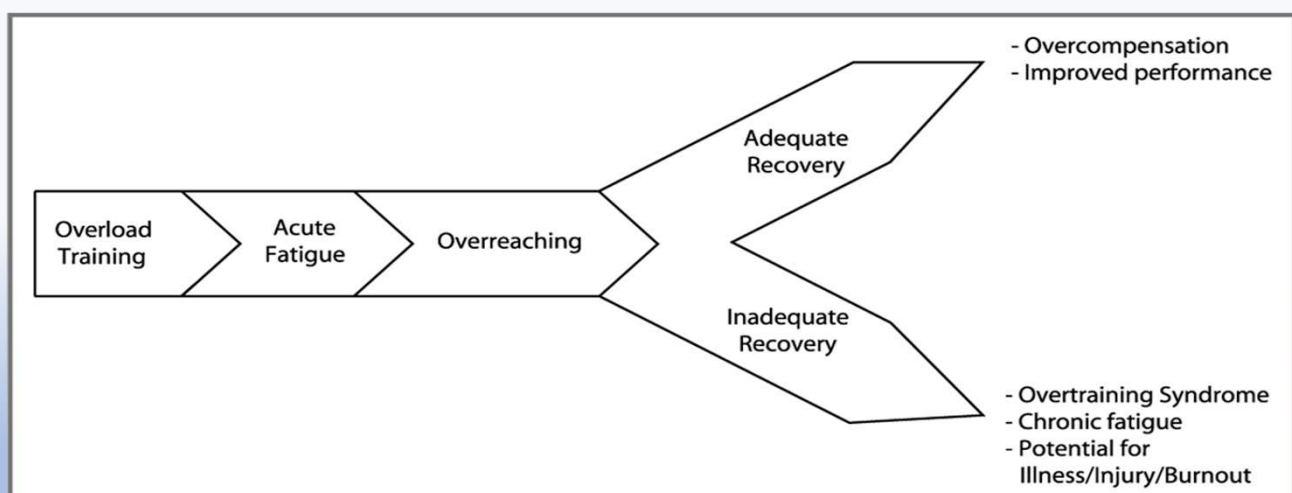


Why Injury ?

The first step toward preventing injuries is understanding how they happen. There are plenty of reasons why injuries occur:

- Improper equipment or playing surfaces
- Poor instruction on proper movement and technique
- Lack of proper warming-up, cooling-down and stretching exercises
- Missed communication from coaches and teammates during play
- Overexertion/overuse and exhaustion
- Lack of good nutrition
- Just plain bad luck!

Over training



Watch for over training

When the competitive drive takes hold, your child might start going all-in on exercising and training. Keep tabs to make sure that the young athlete workouts stay safe and reasonable. Medical professionals recommend at least one rest day per week and three months off from a sport each year.

Support different sport

We are at the time where sport specialization is more common, but to support an healthy body a mix of different sport thru the year is recommended to reduce the risk of overuse injury and tear.

Categorization of Risk Factors for Overuse Injury	
Intrinsic Risk Factors	Extrinsic Risk Factors
Growth-related factors <ul style="list-style-type: none"> • Susceptibility of growth cartilage to repetitive stress • Adolescent growth spurt 	Training workload <ul style="list-style-type: none"> • Rate • Intensity • Progression
Previous injury	Training and competition schedules
Previous level of conditioning	Equipment/footwear
Anatomic factors	Environment
Menstrual dysfunction	Sport technique
Psychological and developmental factors <ul style="list-style-type: none"> • Athlete specific 	Psychological factors <ul style="list-style-type: none"> • Adult and peer influences

DiFiori JP, Benjamin HJ, Brenner JS, et al. Overuse injuries and burnout in youth sports: a position statement from the American Medical Society for Sports Medicine. Br J Sports Med.2014;48: 287-288.

The most common injury

Contusions and strains are the most common injuries sustained by young athletes. In early adolescence, apophysitis or strains at the apophyses are common. The most common sites are at the knee (Osgood-Schlatter disease), at the heel (Sever's disease) and at the elbow (Little League Elbow).

Common Injury

- **Ankle injuries** – including sprains and growth plate fractures
- **Knee pain** – which is frequently caused by runner's knee (patellofemoral pain syndrome) or Osgood-Schlatter disease, an overuse injury of the growth plate just below the kneecap
- **ACL tears** – involving the anterior cruciate ligament, the stabilizing ligament of the knee
- **Elbow pain** – overuse can result in little league elbow (common name), an injury to the growth plate on the medial/inside of the elbow

Common Injury continue

- **Concussions** – brain injuries caused by impacts to the head, potentially resulting in serious complications
- **Broken bones** – fractures can range from overuse injuries (stress fractures) to acute breaks that may require casting or surgery
- **Shin splints** – a common overuse injury (technically called medial tibial stress syndrome) that involves inflammation of the outer edge of the shin bone
- **Vertebral stress fractures** – spondylolysis causing activity-related back pain

Red flag

- Concussion

Children's brains do not have the amount of coating, or myelination, as adult brains. Additionally, nerve fibers in children allow more acceleration of the brain with a big hit, and because the brain is lighter than an adult brain, and it can move more easily.

- Stress fracture

Scoliosis in Athletes

Prevalence of idiopathic scoliosis in athletes: a systematic review and meta-analysis
Leila Mousavi, Foad Seidi, Hooman Minoonejad, and Farshad Nikouei

The prevalence of IS in athletes was similar or higher to that as seen in other studies of the general population. IS prevalence may have a U-shaped relationship relative to level of competition. Further studies are required to determine which sports have the highest IS prevalence.

The prevalence of scoliosis is between 2 to 3% and a majority of the scoliosis start between 10 and 15 years old.

HANDS ON

*let see if
you still
have PR*



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Covid and sport

Obesity

Development problem

Low social interaction

Too much screen

Stress

Depression...



The Covid Consequence (CT)

PROFESSIONAL MINDS IS PROUD TO PRESENT

The COVID Consequence

How the pandemic has affected kids, their development, education at large and where to go from here.

- Curriculum recovery - a perspective from schools worldwide.
- Academic and developmental delays, Phobias, anxieties & Attachment disorders
- Communication, body language and facial expressions
- Socialization, social interactions & inappropriate behaviour
- Screen time and visual impairments
- Long covid and residual effects.
- Vaccine or no vaccine

WHERE TO FROM HERE?

What does the future look like?
How do we help kids?

CPD ACCREDITED- 23rd April, 2023 - Cape Town

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Athletic trainer at youth sport (source)

As it relates to COVID-19 and the challenges relating to student athlete health and safety, the AT is one of the athletic department staff's best equipped staff member to provide daily support. ATs maintain an educated perspective regarding not only injury management, but the importance of sleep, activity and social connectivity. Acting as a conduit to resources to advocate for the best interests of each individual and team, the AT acts as the liaison from the department and program to the student athlete. Challenges faced may relate to injury management and rehabilitation; coordination of follow up/compensatory medical care; referral to specialists/imaging/physical therapy; mental health (ranging from depression and anxiety to bipolar and true mental health crisis); concussion recognition, evaluation and management, insurance processing and nutrition. Current struggles may also include difficulty adjusting to the new normal, accessing resources and many other new situations that arise from the uncertainty of COVID-19. The intercollegiate student athlete will engage with an AT to find guidance.

As COVID-19 presents new and unique challenges never seen before, ATs and team physicians must prepare for an eventual safe return for all student athletes to our respective campuses. Especially in anticipation of resuming training and competition, the reliance on our ATs may be most important now considering their expertise, connections and unique skill set. The preparation for this initiative is ongoing and constant and must exist in a continuum. Interrupting this initiative, and failure to recognize the vital role of the AT, will directly impact the health and safety of all student athletes.

Safe habits

As a chiropractor, the youth athlete might respond better to you for safe habit, sleep and diet requirement.

Chiropractor can also be more aware of body difference and help the youth athlete to achieve better and decrease the risk of injury, for that it's important to understand the development of the child and his weakness.



Thanks for your attention




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Annexes



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Scoliosis

- Olympic swimmer Natalie Coughlin was diagnosed at age 30 with a 27-degree curve. She won six medals in six events at the Beijing Games.
- Eleven years after surgery to correct a 72-degree curve in her spine, Kyra Condie was one of the first U.S. Olympians to compete in sport climbing at the 2020 Tokyo Olympics.
- Junior Olympian Juliette Clark was told she would never play water polo again after her scoliosis surgery for her severe curvature. A year later, she won a gold medal at the National Junior Olympics.
- Pro golfer Stacy Lewis was diagnosed with scoliosis at age 11. She wore a brace for seven years (18 hours a day), taking it off only to play golf. She then had corrective surgery to complete her straightening process. She went on to win the NCAA Division I individual championship title in college and was named the 2012 LPGA player of the year.

Youth Athletes: Nourishing Young Bodies and Minds

[C. Rosenbloom](#)

Published 2016, Education, Nutrition Today

Youth participation in individual and team sports is high, yet little is known about the nutritional needs of children or adolescents who compete in sports. Parents and volunteer coaches are responsible for nutrition and hydration advice for youth athletes and it can be woefully incorrect. There are no predictive equations for energy needs, and research on protein intake for muscle growth and repair is conducted on adults. Currently, the best we can do is adapt nutrition guidelines for adults to young athletes, using growth and development as a guide for monitoring success with the implementation of nutrition strategies. Hydration strategies are critical for young athletes as heat illnesses occur more frequently in this group compared with adults. Young athletes are not immune to messages on enhancing muscle development, and use of performance enhancing substances is higher than previously thought. Strategies for nutrition education for young athletes are included, based on psychosocial development. Nutr Today. 2016;51(5):221Y227

Anatomical and Physiological Differences between Children and Adults Relevant to Traumatic Brain Injury and the Implications for Clinical Assessment and Care

Anthony A. Figaji

Adult physicians often underestimate the differences between adults and children. Those who work with children seldom do. Although children *are* very different from adults in physiology and disease, we commonly extrapolate data from adult traumatic brain injury (TBI) studies to pediatrics. At best this is often inappropriate; at worst it may be dangerous. The problem is that there are fewer studies in children, and so less evidence on which to base recommendations. Children are seen as a vulnerable population in ethics terms and so extrapolation from adult data is encouraged, which contributes to this practice. Its unintended consequence is weakened evidence to direct treatment for this most vulnerable population. This may be defensible if children were easier to treat than adults but unfortunately the converse is true.



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OVERTRAINING IN YOUNG ATHLETES

How Much Is Too Much?

Faigenbaum, Avery D. Ed.D., FACSM

Millions of boys and girls participate in organized and recreational sports in the United States. However, there seems to be an increasing number of young athletes who specialize in just one sport starting at a young age or compete for multiple teams year-round without adequate time for recovery between sport seasons. This type of intense training and competition can result in injuries, illness, or burnout. Qualified fitness professionals are in a unique position to design and implement age-appropriate training programs that can reduce the risk of sports-related injuries and enhance athletic performance in young athletes.



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