Role of Sports Specialization on Overtraining, Burnout, and Mental Health Considerations



Tamara C. Valovich McLeod, PhD, ATC, FNATA John P. Wood, D.O., Endowed Chair for Sports Medicine

Professor and Director, Athletic Training Programs Research Professor, School of Osteopathic Medicine in Arizona

Overview

- Benefits of sports on psychological health
 - Social
 - Cognition
 - Academics
- Impact of early sports specialization
 - Overtraining
 - Burnout
 - Mental health
- Positive paths forward



Benefits of Physical Activity and Sport



ACTIVE KIDS DO BETTER IN LIFE WHAT THE RESEARCH SHOWS ON THE COMPOUNDING BENEFITS



EARLY CHILDHOOD ADOLESCENCE ADULTHOOD

Aspen Institute: https://www.aspenprojectplay.org/the-facts/

Social and Psychological Benefits



Positive correlation between regular physical activity and mental health



Athletes less likely to engage in smoking compared to peers



Sports can improve overall personal development

Women's Sports Foundation, 2014, 2018; GAO, 2012; McDowell, 2017

Cognitive Health Benefits Organized sport activity associated with better cognitive skills and selfregulation in children (Piche, 2015)

More likely to attend college if participated in sport in high school (US Dept of Education, 2005)

Over 90% of surveyed female executives report playing organized Sport (EY Women Athletes Business Network)



Sports Participation Positively Associated with



Academic achievement in English



Academic achievement in math





High School GPA

Fox, 2010; Dyer, 2017; Van Boekel, 2016

Academic and Behavioral Performance

Lower at-risk dropout	 Athletes 35.2% vs Non-Athletes 52.3% 6.8-18.3% risk reduction for dropping out among various ethnicities 	
Higher passing rates	 On all components: math, English, reading, writing, science, social studies 19.7-49.4% differences 	
Higher commendable rate	 90th percentile 11.8-18.4% differences 	
Fewer disciplinary actions	Athletes 0.85 vs Non-Athletes 1.23 / day	

Eldridge, 2014

Quality of Life: Adolescent Athlete vs. Non-Athlete



SF-36 mental composite Physical functioning General health Social functioning Mental health

Snyder, 2010

Quality of Life: Adolescent Athlete vs. General Population



Total PedsQL Psychosocial summary Emotional functioning Social functioning School functioning

Lam, 2013

Early Sports Specialization





Typical Aspects of Early Sports Specialization



National Athletic Trainers' Association Position Statement: Prevention of Pediatric Overuse Injuries

Tamara C. Valovich McLeod, PhD, ATC*; Laura C. Decoster, ATC†; Keith J. Loud, MDCM, MSc‡; Lyle J. Micheli, MD§; J. Terry Parker, PhD, ATC||; Michelle A. Sandrey, PhD, ATC¶; Christopher White, MS, ATC#

Delayed Specialization

- 1. Pediatric athletes should be encouraged to participate in multiple sports and recreational activities throughout the year to enhance general fitness and aid in motor development.^{5,13} *Evidence Category: C*
- 2. Pediatric athletes should take time off between sport seasons and 2 to 3 nonconsecutive months away from a specific sport if they participate in that sport year-round.³¹ *Evidence Category: C*
- 3. Pediatric athletes who participate in simultaneous (eg, involvement in high school and club sports at the same time) or consecutive seasons of the same sport should follow the recommended guidelines with respect to the cumulative amount of time or pitches over the year.³¹ *Evidence Category: C*



Early Sport Specialization

Overuse Injury

Sport specialization is associated with an increased risk of overuse musculoskeletal injuries (SORT grade: B)

Valovich McLeod, 2009, 2010, 2017, 2019; Simon, 2016, 2019; Houston, 2016, 2017; Lam, 2017, 2019; Bell, 2018



Valovich McLeod, 2009, 2010, 2017, 2019; Simon, 2016, 2019; Houston, 2016, 2017; Lam, 2017, 2019; Bell, 2018



Valovich McLeod, 2009, 2010, 2017, 2019; Simon, 2016, 2019; Houston, 2016, 2017; Lam, 2017, 2019; Bell, 2018

Early Sport Specialization

- High training volume
- Year round participation

- Social isolation
- Poor academic performance
- ↑ Anxiety
- ↑ Stress
- Inadequate sleep
- ↓Family time
- Burnout

Table 1. Position Statements on Early Sport Specialization from Various Societies

Торіс	American Academy of Pediatrics ⁶	American Medical Society for Sports Medicine ¹	American Orthopaedic Society for Sports Medicine ⁵	Fédération Internationale de Médecine du Sport ^e	International Olympic Committee ²⁰	National Athletic Trainers' Association ⁷	National Strength and Conditioning Association [®]
Position on early sport specialization	Discouraged	Discouraged	Discouraged	Discouraged	Can be acceptable and healthy if there is broad range of biomechanical exposures within sport, as well as	Discouraged	Discouraged
Psychosocial and physical risks of early specialization	Increases chances of injuries, stress, burnout	May increase rates of overuse injury and burnout	Risk for burnout, overuse injury, decrements in training	Intensified training leads to physical and mental stress and increased rates of dropout	Can lead to increased load, decreased recovery, overuse injury, and burnout	Increases overuse injury, risk for nutritional and sleep deficits, psychosocial concerns, and burnout	Increased overuse injury, dropout, blunted motor skill portfolio
Benefits of early, diversified training	Increases likelihood of lifetime sports involvement, physical fitness, and possibly eite participation	May be more effective in developing elite- level skill due to skill transfer	Increased long-term participation in sports, increased personal development	Helps identify sports that best fit interests, increases success/ enjoyment of sport, and decreases attrition	Fosters development of wider scope of athletic and social skills; encourages sustained sports participation and enjoyment	Enhances general fitness and aids in motor development	Increases overall athleticism and reduces injury risk; facilitates longer sporting careers, increased chance of sustained participation
Appropriate age of specialization	Late adolescence	Late adolescence	Late addescence (age 16)	Not defined	Not defined	Not defined	Not defined
Exception sports	Diving, figure skating, gymnastics	Diving, figure skating, gymnastics, swimming	Figure skating, gymnastics	Not specified	Not specified	Not specified	Not specified
Other recommendations	Take off 1–2 d/wk and 3 mo/y in 1- mo increments	Further research needed regarding effect of specialization on overuse injuries, controlling for intensity and work load	Periodic strength and conditioning to enhance diverse motor- skill development	Competitive weight lifting/ power lifting should not be recommended before completion of puberty; excessively long distance running not recommended before maturation	Athlete development should be viewed on individual basis; definition of athletic success should be centered on the athlete as a whole, unique person	Take time off between sport seasons and 2–3 mo away from sport	Neuromuscular training should be started in early childhood to promote long- term physical development

Jayanthi, 2019

Burnout

"Response to *chronic stress* in which a young athlete ceases to participate in a previously enjoyable activity"

Athlete placed in situation of varying demands

Demands are perceived as excessive Young athlete experiences varying physiological responses

Varying burnout consequences develop

Smith, 1986

Risk Factors for Burnout

- Personal
 - Perfectionism
 - Need to please others
 - Non-assertiveness
 - Focusing only on one's athletic involvement
 - Low self-esteem
 - High level of perceived stress

- Environmental
 - High training volume
 - Excessive time commitment
 - Demanding performance expectations
 - Frequent, intense competitions
 - Inconsistent coaching practices
 - Little personal control in sport decision making
 - Negative performance

Brenner, 2019

Personal Characteristics

External Factors

Psychosocial Disorders

Maladaptive Coping Mood Disturbances Loss of Motivation

Burnout



TABLE 7. Diagnosis of Overtraining Syndrome/Burnout^{180,192}

History

- Decreased performance persisting despite weeks to months of recovery
- Disturbances in mood
- Lack of signs/symptoms or diagnosis of other possible causes of underperformance
- Lack of enjoyment participating in sport
- Inadequate nutritional and hydration intake
- Presence of potential triggers: (a) increased training load with adequate recovery, (b) monotony of training, (c) excessive number of competitions, (d) sleep disturbance, (e) stressors in family life (parental pressure), (f) stressors in sporting life (coaching pressure and travel demands), (g) previous illness.
- Testing (if indicated by history)
 - Consider laboratory studies: complete blood count, comprehensive metabolic panel, erythrocyte sedimentation rate, C-reactive protein, iron studies, creatine kinase, thyroid studies, cytomegalovirus and Ebstein-Barr virus titers.
 - Profile of Mood States (POMS): A psychometric tool for a global measure of mood, tension, depression, anger, vigor, fatigue, and confusion.¹⁶⁹

AGE CHILDREN QUIT REGULARLY PLAYING A SPORT (AGES 3-18)

SPORT	AVG. AGE OF LAST REGULAR PARTICIPATION	AVG. LENGTH IN YEARS OF PARTICIPATION	
Baseball	10.5	3.3	
Basketball	11.2	3.2	
Bicyling	9.5	2.5	
Cross Country	12.7	1.7*	
Field Hockey	11.4	5.1	
Flag Football	10.4	4.1	
Tackle Football	11.9	2.8	
Golf	11.8	2.8	
Gymnastics	8.7	3.0	
Ice Hockey	10.9	3.1	
Lacrosse	11.2	2.2	
Martial Arts	9.2	2.6	
Skateboarding	12.0	2.8	
Skiing/Snowboarding	12.1	4.3	
Soccer	9.1	3.0	
Softball	10.4	2.8	
Swimming	10.2	3.2	
Tennis	10.9	1.9	
Track and Field	13.0	2.0*	
Volleyball	12.3	2.0*	
Wrestling	3.0	1.6	
All Sports	10.5	2.9	

Aspen Institute, 2019

#DONTRETIREKID



Ask kids what they want





Train all coaches

"Kids everywhere drop out of sports too early. Together, we can keep them in the game." Aspen Institute, 2019

Preventing Burnout

Encourage Life Balance

- Academics
- Non-sport activities
- Peers

Strong Social Support System

Family
Athlete
Coaches
Medical Staff

Valovich McLeod, 2011; Bergeron, 2015; LaPrade, 2016

Preventing Burnout



Keep workouts interesting, with age-appropriate games and training, to preserve fun during practices



Take 1 to 2 days per week off from organized or structured sport participation to allow the body to rest or to participate in other activities



Take 2-3-month breaks from structured training and competition in 1 sport while focusing on other activities and cross-training



Focus on wellness and teaching athletes to be in tune with their bodies so they become alert to cues that they need to slow down or alter their training methods



Emphasize skill development more than competition and winning

Brenner, 2007, 2016; DiFiori, 2014

Athlete Development Models



Developmental Model of Sport Participation

Mid- Late Teen	Single Sport	Single Sport	Multiple Sports	
Early Teen	Single Sport	Multiple Sports	Multiple Sports	
Youth	Single or Multiple Sports	Multiple Sports	Multiple Sports	

Côté, 1999

Pathway 1: Early Specialization



Côté, 1999

Pathway 2: Late Specialization





Pathway 3: Recreational Multisport



Côté, 1999



The American Development Model is meant to explain an athlete's advancement through a pathway supporting a healthy sport experience based on their physical, mental and emotional level and potential for growth.



American Development Model

https://www.teamusa.org/About-the-USOC/Athlete-Development/Coaching-Education/American-Development-Model

USA Hockey LTAD / Athletics Canada

	LTAD STAGES	
8	Hockey for Life	
7	Training to Win 19+ Junior (NCAA, NHL)	
6	Training to Compete Junior (NCAA)	
6	Learning to Compete 18 and under (Midgets)	
4	Training to Train 15-16 and under (Midgets) / 13-14 and under (Bantams)	
- 3	Learning to Train 12 and under (Peewees) / 10 and under (Squirts)	
2	FUNdamentals 8 and under (Mites) / 6 and under (Mites)	
1	Active Start 6 and under	

The 9 Stages

- 1. Active Start
- 2. FUNdamental
- 3. Learning to Train
- 4. Training to Train
- 5. Learning to Compete
- 6. Training to Compete
- 7. Learning to Win
- 8. Winning for a Living
- 9. Active for Life

https://www.admkids.com/page/show/91048 8-what-is-the-american-development-modelhttps://athletics.ca/wpcontent/uploads/2015/01/LTAD_EN.pdf

Long-Term Athletic Development

Long-term athletic development pathways should accommodate for the highly individualized and non-linear nature of the growth and development of youth

Youth of all ages, abilities and aspirations should engage in long-term athletic development programs that promote both physical fitness and psychosocial wellbeing

All youth should be encouraged to enhance physical fitness from early childhood, with a primary focus on motor skill and muscular strength development

Long-term athletic development pathways should encourage an early sampling approach for youth that promotes and enhances a broad range of motor skills

Health and wellbeing of the child should always be the central tenet of longterm athletic development programs

Lloyd, NSCA, 2016

Long-Term Athletic Development

Youth should participate in physical conditioning that helps reduce the risk of injury to ensure their on-going participation in long-term athletic development programs

Long-term athletic development programs should provide all youth with a range of training modes to enhance both health- and skill-related components of fitness

Practitioners should use relevant monitoring and assessment tools as part of a long-term physical development strategy

Practitioners working with youth should systematically progress and individualize training programs for successful long-term athletic development

Qualified professionals and sound pedagogical approaches are fundamental to the success of long-term athletic development programs

"Number one is just to gain a passion for running. To love the morning, to love the trail, to love the pace on the track. And if some kid gets really good at it, that's cool too." – Pat Tyson, award-winning high school and college cross-country coach*

"Somewhere behind the athlete you've become and the hours of practice and the coaches who have pushed you is a little girl who fell in love with the game and never looked back... play for her." –Mia Hamm, member of United States women's national soccer team*

"Before kids can play like a pro, they must enjoy playing the game like a kid." –Steve Locker, national and international soccer player, coach, and author**

ATSU Concussion Program | Athletic Training

www.atsuconcussion.com Tamara C. Valovich McLeod, PhD, ATC, FNATA tmcleod@atsu.edu | 480-219-6035



