

Youth Sports Specialization: What is this doing to our young athletes?

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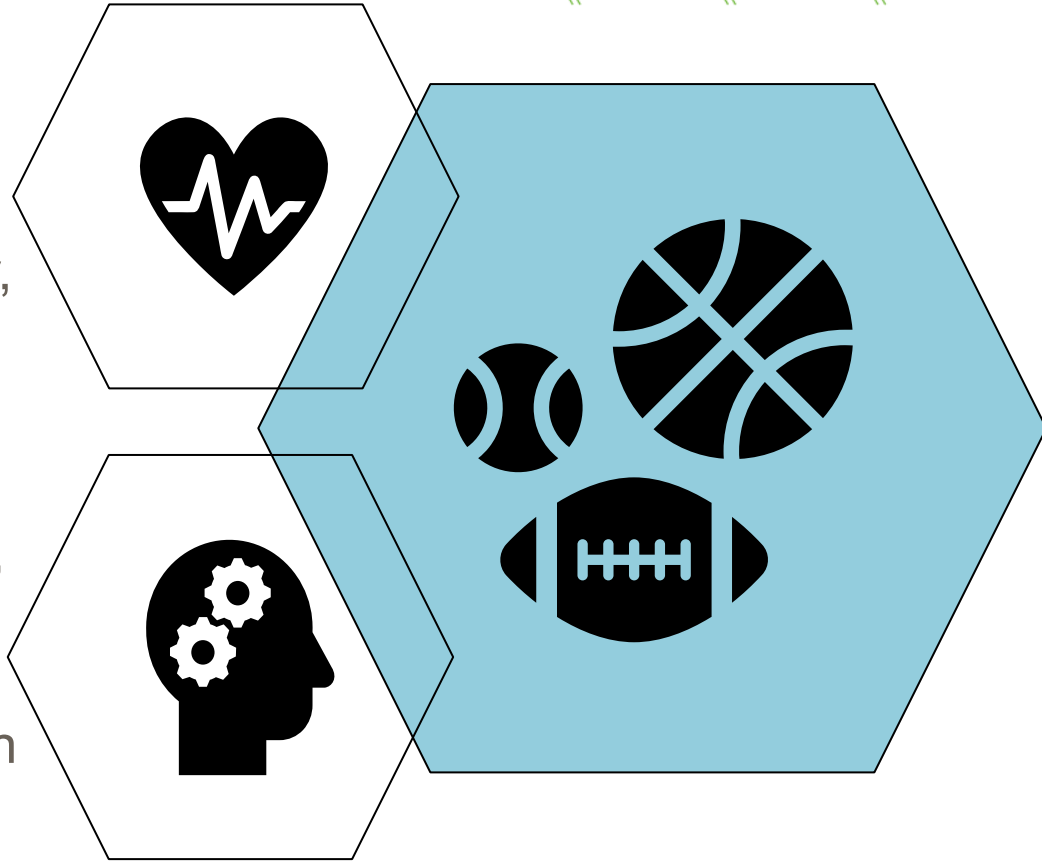
Objectives

1. Be familiar with the emerging term sports specialization
2. Recognize the mental health impacts of sports specialization
3. Know the major organizational recommendations pertaining to sports specialization

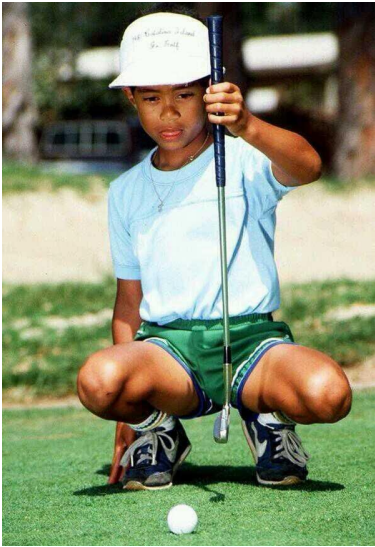


Benefits of sport

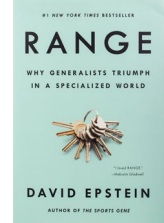
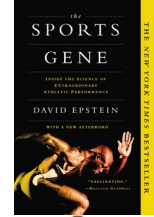
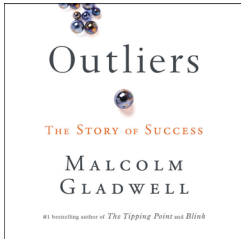
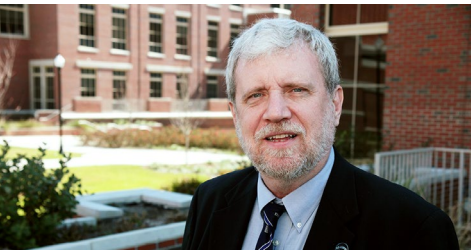
- Physical: improved bone density, neuromuscular skill adaptation, cardiovascular health
- Mental/social: peer socialization, increased self-esteem, social connectedness, psychological resilience, decreased depression



What is youth sports specialization?



VS



What is Sports Specialization?

- Intense training, essentially year-round, in a single sport to the exclusion of all other sports.
- 10-30% of youth athletes in USA specialize in single sport at age 12-14

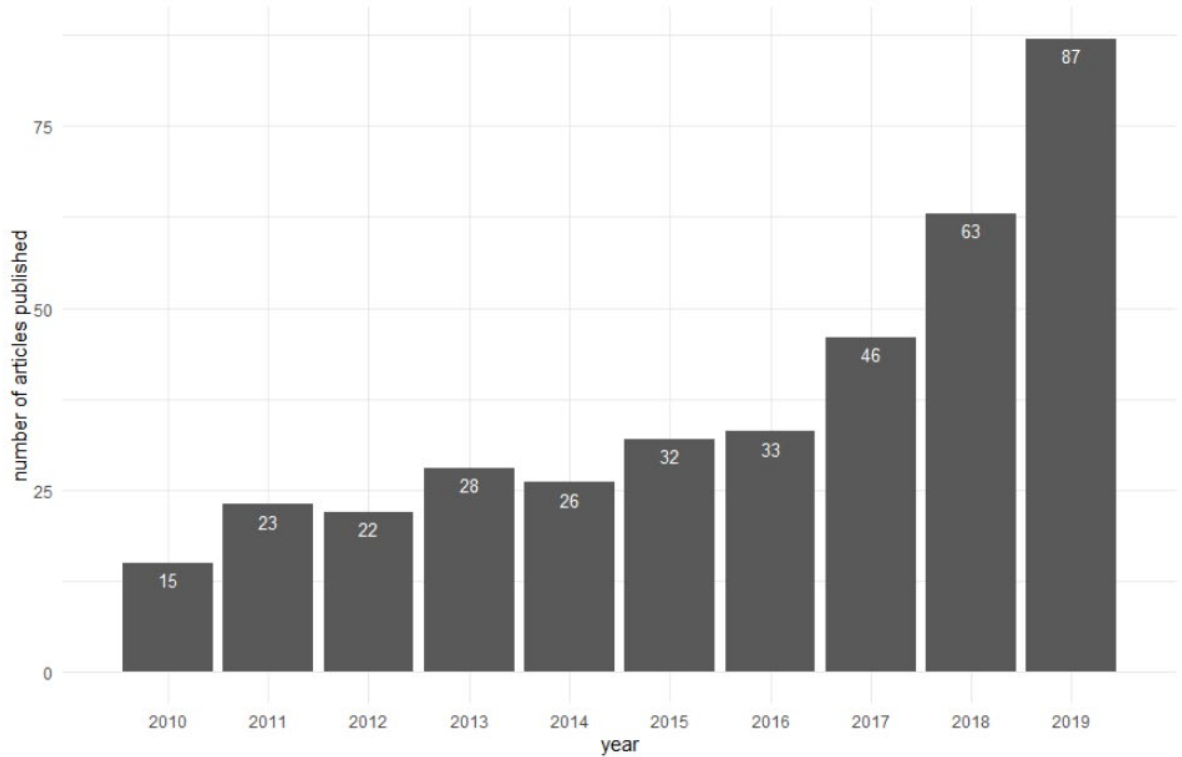


Sports Specialization – literature definition

- Participates in one sport only
 - Participation in a single sport (specialized) versus multisport participation (not-specialized).
 - Exclusive participation in main sport
- Chose to be unisport
 - Quit other sports to focus on main sport
 - Participation in primary sport to the exclusion of other sports at or before 12 years old
- Year-round participation
 - Train or participate in primary sport more than 8 months out of year



Sports Specialization - research



Sports specialization – Jayanthi scale

1. Primary sport more important than others
2. Quit other sports to focus on one sport
3. Train or participate in primary sport more than 8 months out of year

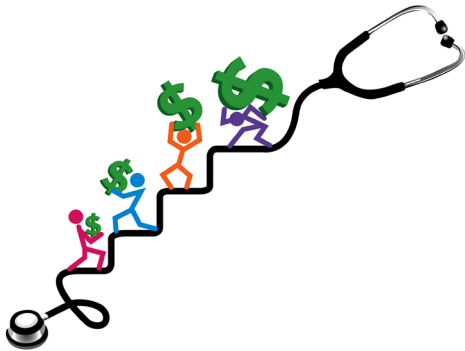


Why would a youth specialize in a single sport?



What are the risks of Youth Sport Specialization?

1. Physical health effects – primarily overuse-type injuries
2. Psychosocial effects – anxiety and burnout
3. Healthcare costs attributed to youth sport specialization estimate US\$800 million to US\$5.2 billion annually.



Sports specialization – overuse injuries

- “Sports Specialization is Associated with An Increased Risk of Developing Anterior Knee Pain in Adolescent Female Athletes” – Hall, et al. *J Sport Rehabil*, 2015
 - Does sports specialization increase risk of PFP in adolescents?
 - N=546 female basketball, soccer and volleyball players; middle and high school
 - N=357 multi sport; N=189 single sport
 - 1.5 x increase in PFP in single sport group
 - 4 x increase in SLJ/patellar tendinopathy and OSD in single sport group



Sports specialization – overuse injuries

- “Sports-specialized intensive training and the risk of injury in young athletes: a clinical case-control study” – Jayanthi, et al. *AJSM*, 2015
 - Is sports specialization associated with increased risk for injury and serious overuse injury in young athletes?
 - N=1190 (50.7% male); 822 injured, 368 uninjured controls
 - Sports specialization independent risk factor for injury (OR, 1.27) and serious overuse injury (OR, 1.36)
 - Young athletes participating in more hours of sports per week than number of age in years (OR, 2.07) or whose ratio of organized sports to free play time was >2:1 hours/week had increased odds of having a serious overuse injury (OR, 1.87)

Sports specialization – overuse injuries

- “A Prospective Study on the Effect of Sport Specialization on Lower Extremity Injury Rates in High School Athletes.” McGuine et al. *AJSM* 2017
 - Is sport specialization prospectively associated with an increased risk of LEIs in high school athletes?
 - N=1544 participants (50.5% female; mean age, 16.1 years)
 - Sport specialization was classified as low (59.5%), moderate (27.1%), or high (13.4%)
 - LEIs for moderate participants was higher than for low participants (HR, 1.51). The incidence of LEIs for high participants was higher than for low participants (HR, 1.85)



Sports specialization – overuse injuries

- “The Association of Sport Specialization and Training Volume With Injury History in Youth Athletes.” - Post et al. *AJSM* 2017
 - Are high levels of sports specialization associated with history of injuries?
 - N=2011 (51% male, 12-18 yrs)
 - Highly specialized vs low specialized athletes more likely to report previous injury of any kind (OR, 1.59)
 - Participating in primary sport for more hours per week than age more likely to report injury of any kind (OR, 1.34)
 - Primary sport more than 8 months out of year more likely to report upper extremity (OR, 1.68) and lower extremity (OR, 1.66) overuse injury.



Sports specialization – overuse injuries, takeaways

1. Increased risk of overuse injury in athletes specializing in a single sport
2. Most of the studies are retrospective – need more prospective research.
3. Generalized term for all sports – does sport specificity make a difference?

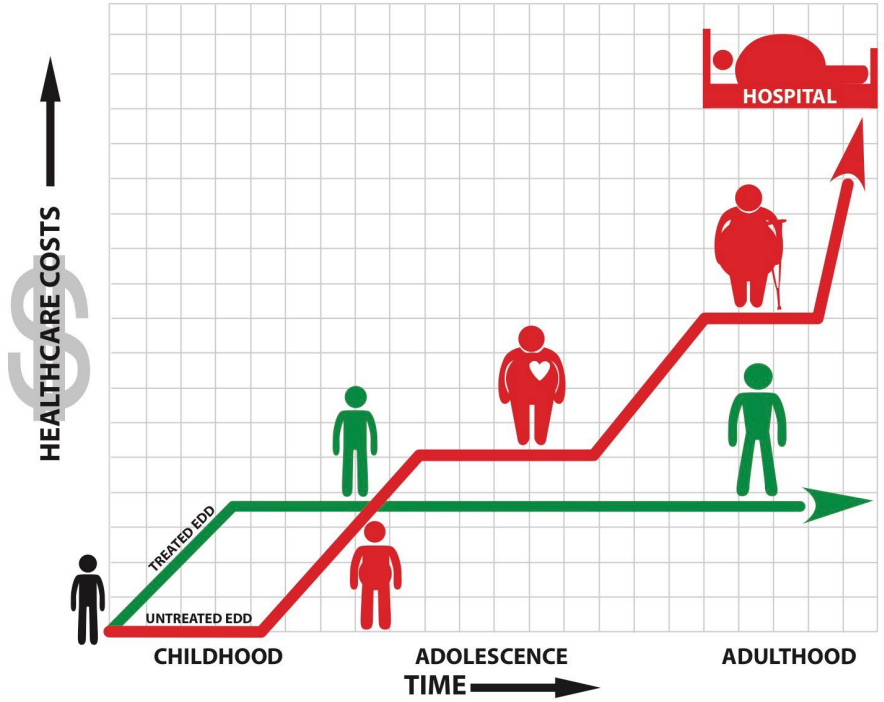


Physical inactivity – a pandemic



Physical inactivity – a pandemic

Effect of Treated vs. Untreated EDD



Physical activity – mental health

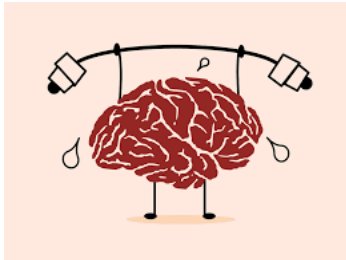


- Decreased depression regardless of age or geographical location
- Decreased risk for anxiety
 - Schuch FB, et al. Physical activity protects from incident anxiety: A meta-analysis of prospective cohort studies. *Depress Anxiety*. 2019 Sep;36(9):846-858.



Sports Specialization – mental health

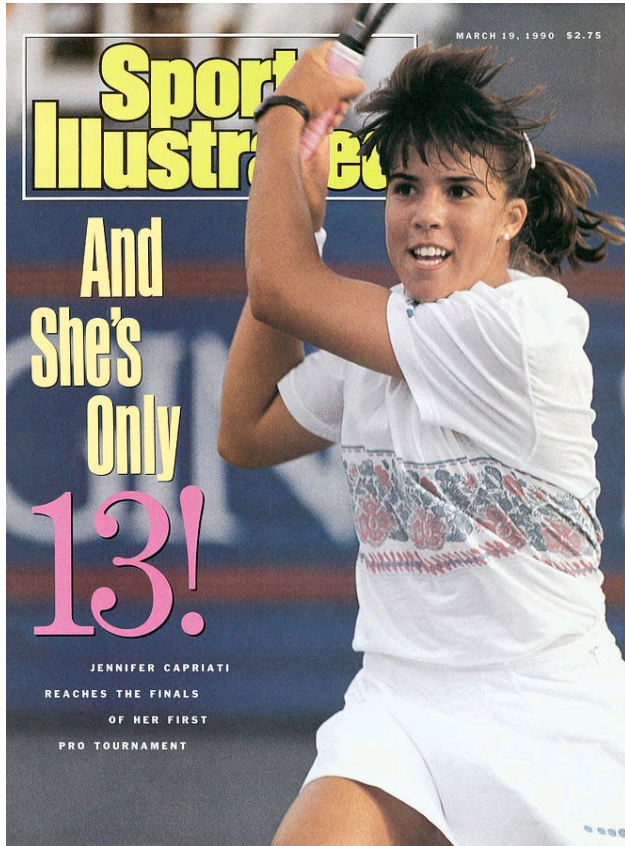
- “Sports participation volume and psychosocial outcomes among healthy high school athletes.” Gagliardi et. al. *J Clin Transl Res.* 2020
 - Does volume of sport affect anxiety and depressive symptoms in high school athletes?
 - N=230 (15.4 years average)
 - PROMIS Pediatric Profile 25
 - More hours per week playing sport were significantly associated with lower levels of depressive symptoms



Sports Specialization – mental health

- “Sport specialization, sleep, fatigue, and psychosocial ratings: do highly specialized athletes differ from their less specialized peers?” Stockbower et al. *Phys Sportsmed*, 2021
 - Assess sleep quality, fatigue, anxiety and depressive symptoms across spectrum of sports specialization
 - N=186 athletes at PPE
 - PROMIS Pediatric Profile 25
 - Compared with moderate-specialized athletes, highly specialized athletes had higher levels of fatigue, anxiety, and depressive symptoms.
 - No differences in training volume or injury history.

Sports specialization – burnout



- WTA introduced age eligibility rule (AER) in 1995.
 - Limitations on tournaments played beginning no earlier than age 14
 - Tournament limit increases until age 18.
- 10-yr follow up (Otis et al. *BJSM*, 2006) showed that premature dropout reduced from 7% to 1% and career lengths increased about 2 years.

Sports Specialization – mental health

1. Intense training in one sport may affect an athlete's psychological wellbeing. However, evidence-based research is lacking
2. Physical activity may be protective against anxiety and depression
3. Burnout seems to be key component



Doesn't sports specialization improve athlete performance and future development?

- “Impact of youth sports specialization on career and task-specific athletic performance: a systematic review following the American Medical Society for Sports Medicine (AMSSM) Collaborative Research Network’s 2019 Youth Early Sport Specialization Summit.” Klithermes et al. *BJSM* 2019
 - Elite athletes specialize between ages of 14-15 compared with non-elite or semi elite peers who specialize prior to age 12.
 - Exception of women’s gymnastics or figure skating where peak performance occurs prior to puberty.



Sports Specialization – NATA recs

1. Delay Specializing in a Single Sport as Long as Possible
2. One Team at a Time
3. Less Than Eight Months Per Year
4. No More Hours/Week Than Age in Years
5. Two Days of Rest Per Week
6. Rest and Recovery Time from Organized Sport Participation



Training Volume and Psychosocial Outcomes

THE PHYSICIAN AND SPORTSMEDICINE
<https://doi.org/10.1080/00913847.2022.2113987>



ORIGINAL RESEARCH

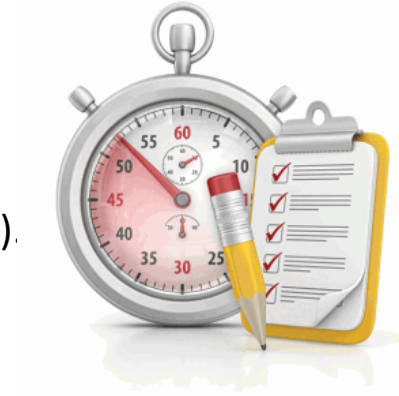
Training volume recommendations and psychosocial outcomes in adolescent athletes

Casey C. Little^a, David R. Howell^{id a,b}, Aubrey M. Armento^{a,b}, Emily A. Sweeney^{a,b} and Gregory A. Walker^{a,b}

^aSports Medicine Center, Children's Hospital, Colorado, CO, USA; ^bDepartment of Orthopedics, University of Colorado School of Medicine, CO, USA



- 161 Athletes (13-18 yo) grouped:
 - Exceeds more hours/week in organized sports than their age: 21%
 - Equal/less hours/week in organized sports than their age: 79%
- Youth in my sport play too many games before college (33% vs. 16%; $p = 0.03$).

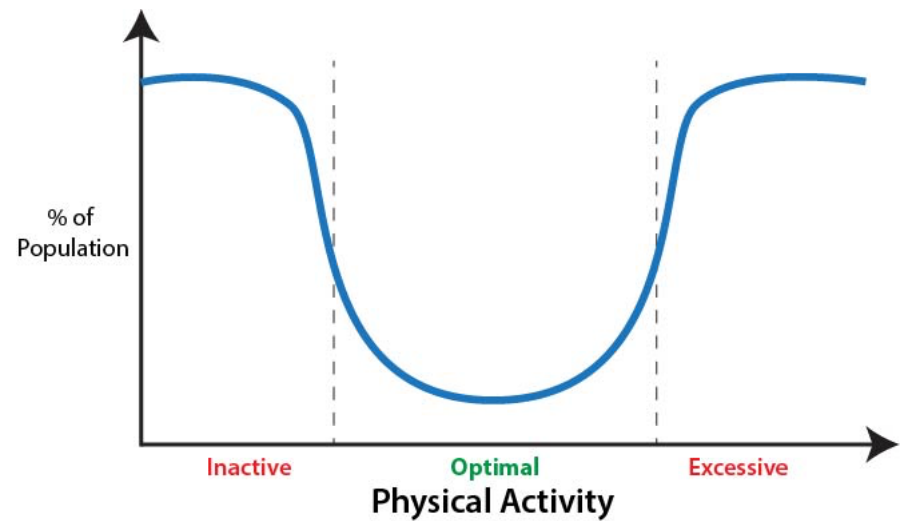
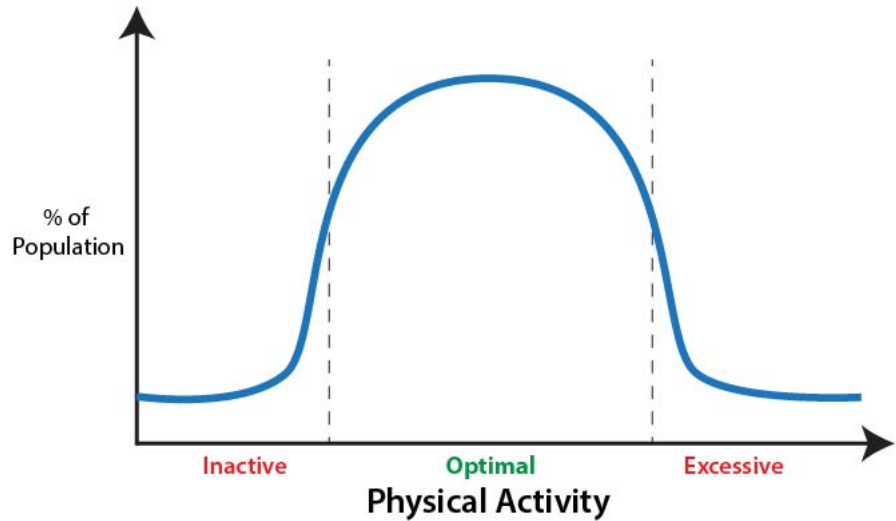


Position statements

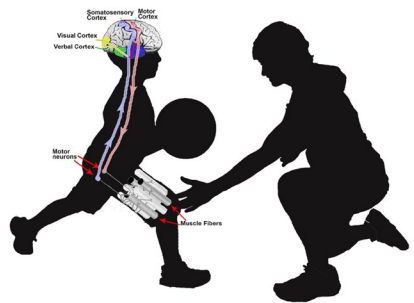
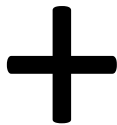
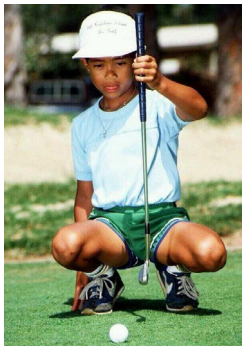
Table 1. Position Statements on Early Sport Specialization from Various Societies

Topic	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 ⁹	International Olympic Committee ²⁰	National Athletic Trainers' Association ⁷	National Strength and Conditioning Association ⁸
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 sport-life balance ⁹	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 elite 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 adolescence (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 weightlifting/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

Sports specialization – relation to physical activity?



Sports Specialization – the quandary



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Extra Slides



Sports specialization – elite performance

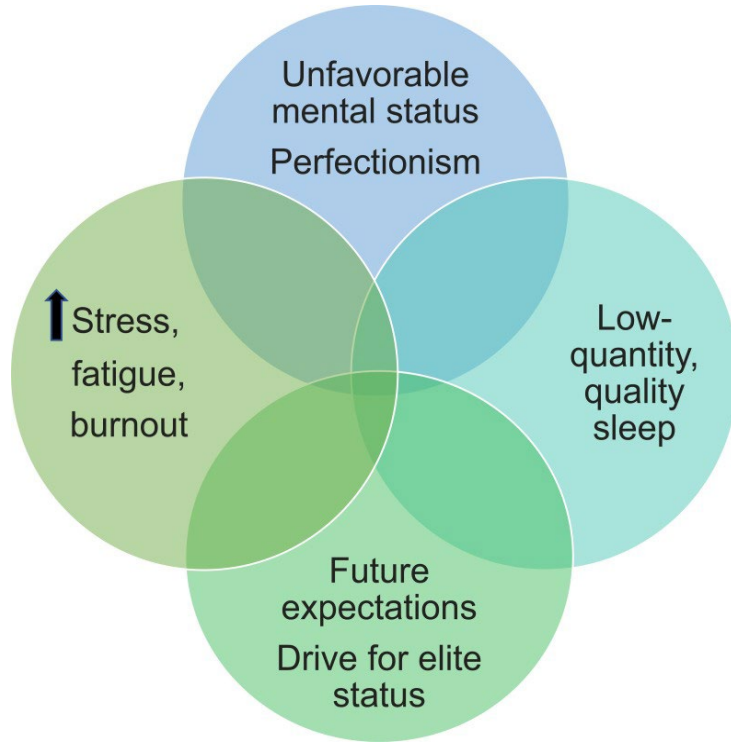
- “Early Sports Specialization Is Associated With Upper Extremity Injuries in Throwers and Fewer Games Played in Major League Baseball.” – Confino et al. *Orthop J Sports Med.* 2019
 - Are MLB players with multisport background less injury prone and have longer careers than single-sport athletes?
 - 1st and 2nd round draft picks 2008-2016
 - N=746, 240 multisport, 506 single sport
 - Multisport athletes played in more MLB games (362 vs 300) and had lower rates of upper extremity injuries than players who played only baseball.



Sports Specialization – AAP, recs for pediatrician

1. Keep it fun
2. Multisport until puberty
3. Greater success with late specialization
4. Early diversification and late specialization leads to lifetime sports involvement and physical fitness.
5. Realistic goals for specialized athlete?
6. Parents monitor youth sports program
7. Three, one-month breaks from primary sport
8. 1-2 days off per week
9. Monitor psychological growth, maturation and nutritional status

Sports specialization – mental health



- Multifactorial:
 - Sports environment
 - Sleep
 - Perfectionism
 - Drive for elite status
 - Social isolation
 - External motivators (parents and coaches)

Sports specialization - burnout

- Burnout:
 - “Chronic stress in which a young athlete cease to participate in a previously enjoyable activity.”
 - R. E. Smith *J Sport Psychol*, 1986:
 - 1. Young athlete placed in situation that involves varying demands.
 - 2. Demands are perceived as excessive.
 - 3. Young athlete experiences varying physiological responses.
 - 4. Varying burnout consequences develop (eg withdrawal).

