Physical Maturity and Chronological Age Grouping – Applications for Youth Soccer

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Youth Sport Participation

• Sport is highly valued by society in the US
• 44 Million Youth Sport Participants
  – Ages 5-17
• 18.2 million soccer players
  – All ages and levels (estimated)
  – Approximately 80% are age 12 and under
• 7 million HS athletes
  – Tremendous growth for girls (Title IX)
Participation cont.

• More than half of North American Children have their first experience in youth sport before age 9
• Participation rates decline sharply by the time children become teenagers (as much as 75%)
• Community recreation programs, clubs, fee-based programs that are sport specific (swimming, gymnastics, Little League, USYSA) or multi-sport (AAU, Kiwanis, YMCA, etc.)
Issues

• Specialization at too early an age
• Overuse injuries (no longer defined seasons)
• Effect of Intensive training on growth and maturation
• Poorly defined programs that do not reflect growth and development aspects in children
• Negative impact on social and psychological development
Selection and Exclusion

- A major limiting factor is the availability of qualified adults to coach and direct programs.
- Most have had little or no background in coaching nor significant preparation in content related to youth player development.
- Economic factors may limit access.
- Increased selectivity and time demands.
- Selection begins as early as age 5.
Position Statement

• Participation in organized sports provides an opportunity for young people to increase their physical activity and develop physical and social skills. However, when the demands and expectations of organized sports exceed the maturation and readiness of the participant, the positive aspects of participation can be negated. (AAP – 2007)
• Because children are beginning to train and compete at earlier ages, there is increasing concern about potential negative effects on growth and maturation.

• The effects of immaturity on sports participation are more obvious. When the demands of a sport exceed a child's cognitive and physical development, the child may develop feelings of failure and frustration. (AAP, 2007)
• Teaching or expecting basic motor and sport skills to develop before children are developmentally ready is more likely to cause frustration than long-term success in the sport. Because most youth sports coaches are volunteers with little or no formal training in child development, they cannot be expected to correctly match demands of a sport with a child's readiness to participate.
Definitions

• Growth refers to observable step-by-step changes in quantity, “measureable changes in body size, for example, height, weight, fatness.” (Malina, 1986)

• Maturation refers to “qualitative system changes, both structural and functional in nature, in the organism’s progress toward maturity, for example, the change of cartilage to bone in the skeleton.” (Tihanyi, 1990)
Growth and Development

• Size, physique and performance are related to the timing and tempo of biological maturation
• Skill and physical characteristics may give a child initial advantages. The opposite is also true
• Growth and maturity must be viewed on a sport-specific basis
• Readiness is a key consideration to beginning participation
Maturation and the Young Athlete

• Early maturation vs. late bloomers
  – We commonly group children in two year categories – there is a huge difference between the oldest and youngest within the group

• Selective retention and elimination of young athletes is a major concern. Late bloomers are at a distinct disadvantage

• Growth and maturity are part of a complex matrix of biocultural characteristics related to the demands of youth sports
Coaching Education

• If you want to teach Spanish to Jane or John, you have to know Spanish and know Jane and John
• If you want to teach Soccer to Jane and John, you have to know soccer and know Jane and John
• In our youth sport structure (and especially in soccer), we don’t know soccer and we don’t know Jane and John.
Long Term Athlete Development (LTAD)

• Developed by Istvan Balyi (Canada)
• Optimal training, competition and recovery programming with relation to biological development and maturation
• Athlete-centered, coach directed and administration and sport science supported
• Identifies sequential stages for training and competition that respect a child’s physical, mental and emotional development
LTAD cont.

• Active Introduction – fundamental movement – not organized sport – Ages 0-6.
  – Learning to walk, run, jump, in non sport specific environment – pre school, backyard, w/friends

• FUNdamental Stage – Males 6-9, Females 6-8
  – Fundamental motor skills and tactical games that emphasize locomotor (changing direction, skipping, leaping hopping), non locomotor (bending, twisting, reaching, pushing pulling) and manipulative skills (ball, bat, stick etc.)
LTAD cont.

• Learning to Train – M 9-12 – F 8-11
  – Developing fundamental sport skills & tactics
• Training to Train – M 12-16 – F 11-15
  – Building the Engine and Sport Specific Skills
• Training to Compete – M 16-23 – F 15-21
  – Optimizing Engine and Sport Specific Skills
• Training to Win – M 19 +/- F 18+/-
  – Maximum Engine and Event/Position Specific Training
• Active for Life – Health and Lifelong Activity
LTAD cont.

• Fundamental Motor Skills + Fundamental Sport Skills = Physical Literacy

• Coaches need to know both + characteristics of the athlete

• Early Specialization vs. Late Specialization Sports
  – Soccer is a Late Specialization Sport that we insist should be an Early Specialization Sport – Big Mistake!!!!
10 Year/10,000 hours

• It takes 10 years of extensive practice to excel in anything! (H. Simon Nobel Laureate)

• It takes 10,000 hours over those 10 years to gain mastery! (Ericsson, 1994).
  – Original studies focused on chess and musicians
  – Other studies have looked at surgeons, fighter aircraft pilots, chefs, teachers, and athletes etc.

• Average of 2.74 hours per day
US Olympic Development

• US Olympians begin their sport participation at the average age of 12.0 and 11.5 years old for males and females respectively.

• On the average, female respondents reached each developmental milestone one year earlier than males.

• Most Olympians reported a 12-13 year period of talent development from their sport introduction to making an Olympic Team.
Soccer Development

• We engage children in organized soccer programs at too young an age (both chronologically and biologically).

• The players would be much better served if instead of forming teams of 4/5 year olds, we introduce the basic motor skills within a soccer format to 6/7 year olds.

• Myth: early starting points will lead to success later on
Stature: Height and Weight

- Most athletes are “on time” or advanced in biological maturity status when compared to non-athletes.
- Too often, later maturation leads to being selected out (the race to building the best teams begins too early – winning over learning).
- Maturity differences are most apparent during the entry stages and at the transition into adolescence.
- Later maturing boys are often successful in sports that are considered late specialization sports.
Peak Height Velocity

• The peak height velocity occurs at a mean of 13.5 years in boys and 11.5 years in girls.
• The average growth spurt lasts 24-36 months.
• Growth during the year of PHV in the normal female averages 9 cm/yr and varies normally from 5.4 cm to 11.2 cm. In the normal male, the PHV averages 10.3 cm/yr and varies normally from 5.8 cm to 13.1 cm.
Synchronized mean height velocity curves (left panels) and synchronized mean growth curves (right panels) of boys (upper panels) and girls (lower panels) transplanted before onset of puberty, as compared with normal children. Abbreviations are: RTx, renal transplantation; MHV, minimal prespurt height velocity; PHV, peak height velocity; EHV, end-point height velocity.
Fitness

• It is widely considered that biological maturity influences physical fitness, and children can be advantaged/disadvantaged in fitness tests by being more mature than counterparts of the same chronological age.

• Sexual maturity has a large influence on fitness measures in boys but less effect in girls.
Athlete-Centered Learning

• The individual should be fundamental to all educational decisions
• We must start with what all learners need and “customize production” on a mass level
• We can’t continue to make group decisions solely on ability or physical characteristics.
• We must create differentiated instruction that involves strategies based on individual learning styles and needs.
Ability Grouping

• It is used in educational settings to place students together by academic potential, ability or past achievement. Often, it allows for a uniform level of instruction.

• It is OK to group players by ability periodically to allow for different group challenges that can help build success and increase confidence levels.

• Random ability grouping is encouraged.
Forming Groups

• In most youth soccer programs, children are assigned to a team of between 6-15 players. There may be a considerable difference physically, cognitively, socially and in experience among the participants.

• The Current Philosophy is based on the concept of “The Game Within the Child”
  – The task is to create an environment where the game within each child can be drawn out
Forming Groups cont.

• For 5/6 year olds the model is:
  – One Player-One Ball
  – Which way do I go?
  – Do as much work with the ball as possible – the game is 3 vs. 3 but they will engage in parallel play

• For 7/8 year olds the model is:
  – Two Players – One Ball – Cooperative play
  – Are you my teammate? – Egocentric
  – Game is 4 vs. 4
Forming Groups cont.

• For 9/10 year olds the model is:
  – Groups of 3/4 – One Ball
  – Team Identity – Peer Group Attachments
  – Encourage multiple interactions – reform groups often

• For 11/12 age group, the model is:
  – Groups of 4-8 – One Ball
  – The dawn of tactical awareness
Forming Groups cont.

• Establish Protocols – courtesies for interaction
• Instantly “Get a Partner”
• Solve math problems to form a group
• Coach Pre forms groups (problematic if some kids aren’t at practice). Can be done on the spot.
• Ability group players to take on group specific tasks
• Structure 3 vs. 3 and 4 vs. 4 games with kids of similar ability – allows for creating a playing identity – build comfort levels
Forming Groups cont.

• Players at all ages need to interact with everyone on the team.
• Players who are more advanced will benefit by working/playing with those of less ability. The reverse is also true.
• Develop a strategy to accommodate everyone, even if the numbers are not “even”.
• Create a culture that everyone is to be welcomed to membership as a partner, a group member and as a teammate.
What do Youth Coaches Need to Know?

• 1. Developmentally appropriate content for the biological maturation of the children they will coach – Know Jane and John

• 2. Fundamental motor skill and soccer specific skills that are learned in a dynamic – game related format

• 3. Pedagogical Content Knowledge – How to teach soccer
How do we address 1-3

- Mandate Coaching Education – National Youth License and Age Group Specific Modules
- Commitment to Developing coches to work with youngest participants
- Change in initial focus from 4/5 year olds to 6-7 year olds – Readiness
- More practice that involves games and fewer scheduled games
- Encourage unstructured play
Addressing 1-3 cont.

- Address community based free play opportunities
  - Neighborhood games
  - After school programs
  - Festival approach at earliest levels
  - Seasons (defined)
  - Understand overuse, rest, recovery, and refuel
  - Turn off TV and Computer
Specialization

- Children will enhance their overall athleticism by engaging in multiple sports.
- This should be encouraged and not limited.
- Children should participate as long as they have interest.
- 81% of US National Team and Hall of Fame Soccer Players played multiple sports through HS. Most credit this as enhancing their soccer abilities.
Questions????????