

3. PHYSICAL GROWTH & MATURATION

IMPLICATIONS FOR DECISIONS
INVOLVING JUNIOR SPORTS
PARTICIPANTS

Introduction

Physical activity is needed for normal growth and development, and for young people to reach their potential in muscle and bone development.

Sport is an ideal way to provide this necessary activity, as it also brings psychological and social benefits to young people.

For the best physical and skill development, consideration must be given to factors related to growth and maturation to help with decisions about grouping young people for participation, and readiness for

- progressions in training* and competition*
- specialisation and intense training.

Developmental Processes

The development of a child is driven by three distinct processes: growth, maturation, and adaptation. These have important implications for training and competition.

Growth is the increase in overall body size with changes in muscle, bone and fat and this affects motor skills. Growth is complicated because

- different parts of the body grow at different rates
- periods of growth start and stop at different times.

Maturation is the genetically programmed series of changes leading to maturity. These changes occur in the same sequence in everybody, but there are great individual differences in

- when puberty starts
- how long it takes (it can be 18 months to 5 years)
- how much growth occurs in the adolescent* growth spurt.

The growth spurt in height happens first and is followed by the growth spurt in weight and then the growth spurt in strength.

Adaptation occurs as a result of external rather than genetic factors (eg intensive training).

The growth spurt in height happens first and is followed by the growth spurt in weight and then the growth spurt in strength.

Implications for Sport

The uneven spread in growth and maturation in young people of the same age makes chronological age of limited value in determining the developmental status of a young person. This creates challenges related to opportunity, training and competition.

Opportunity

Opportunities (eg being selected to participate) may not be offered to some young people because of their current developmental status. Therefore sport providers must

- be aware that late maturing young people may be disadvantaged when competitions are based on chronological age
- encourage young people despite their current body shape as this may be different later on.

Activities should be organised so young people have positive experiences regardless of their developmental status.

Young people and their parents/carers should focus on personal improvement, and not comparison with others of the same age.

The result is more young people having a chance to realise their potential, and expansion of the talent pool for future success in sport.

Guideline 3 – Physical Growth & Maturation

Training/Practice*

For the most part, training and sport activity is beneficial for the best possible physical growth and development of young people.

However, it is important to remember that young people differ from adults in the quality of their tissues and are not able to take the same stresses.

Consequently training must be conducted differently for young people particularly if they are specialising and involved in a narrow range of activities.

Injuries do occur on occasions but are usually reversible. There are times during periods of growth when tissues are more vulnerable.

For example, it takes considerable time for a bone that has lengthened to become strong, and for the muscles, tendons and ligaments to grow to the new length of the bone.

The most common problem is soft tissue injuries (muscles, ligaments and tendons) due to trauma or overuse. Rare problems include the risk of

- fractures particularly during the growth spurt when bones are lengthening and are relatively porous
- injuries to the growth plate* of bones caused by high contact forces or repetitive loading in some sports.

One area of increasing concern is low bone density in adolescent girls in sports requiring leanness at the elite level (see also Guideline 8 under Weight Control).

The high energy expenditure of intense training accompanied by restricted food intake can lead to menstrual dysfunction and precipitate bone loss.

This in turn increases the risk of

- stress fractures in the short term
- osteoporosis in later life.

Healthy eating with sufficient energy for training is important to prevent a negative impact on growth and maturation.

For safety, young people in intense training should have qualified coaches who plan training and competition schedules according to individual needs. These should be

- designed around the holistic needs of young people with consideration of their level of social, emotional and psychological maturation

- planned taking into account all physical activities undertaken by a young person
- adjusted on an ongoing basis so loading is progressive and matched to their developmental stage.

3.1 Strategies for Accommodating Growth and Maturation – Training/Practice

- Plan and adjust training schedules based on individual growth and maturation.
- Monitor for changes indicating a growth spurt (eg faster increase in height, onset of menstrual cycle in girls and voice changes in boys, input from parents) and alter training and competition based on individual needs.
- Educate coaches and parents/carers on issues related to growth and maturation of young people.
- When under-eating is suspected in young people who are training intensely, seek professional advice on healthy nutrition.

Competition

Competition is an important part of sport because it provides challenge in applying, testing and developing skills.

However, the great variation in children of the same age in physical aspects such as height, weight and strength results in the risk of injury and psychological distress when young people are unevenly matched.

It may be necessary to consider groupings based on criteria other than age to favour a positive environment for young people continuing in sport.

Handicapping is a way of allowing the participation in open competition of young people with disabilities, or who are smaller/not as strong as others.

3.2 Strategies Accommodating Growth and Maturation - Competition

- Focus on personal improvement not comparison against others
- Consider the use varied criteria for groupings (eg skill level, experience, body weight rather than chronological age or gender).
- Use handicapping in competitions to reduce the effect of growth and maturation differences.
- Consider skills, physical maturation and psychological development and allow boys and girls to participate together when these are similar.

Talent Development

Some young people are started in hard training early (eg 5 - 8 years) in the belief this will increase the chances of developing an elite athlete.

Early success does not predict success later on. Many world class adult athletes were not outstanding as children.

Expert opinion is that children 12 years and under should be encouraged to participate in a wide range of activities requiring a variety of motor skills before beginning to specialise in a single sport, event or position.

In this way, the athleticism of young people is improved and late developers are encouraged to stay in sports long enough to derive benefit and satisfaction from their eventual maturity.

Some young people have the potential to become elite athletes, and so may wish to train seriously. Their progress is best catered for by

- graduated talent development programs based on quality coaching and talent management
- physical, mental and emotional preparation for the demands of high level competition.
- education about the societal role of elite athletes and the potential impact of success and failure on their lives.

A well-rounded approach is needed so their educational and social needs are not compromised.

Consideration should be given to the difficulty of predicting at an early age the success or otherwise of the future adult athlete.

3.3 Strategies for Talent Development

- Focus on young people having fun so that their interest is maintained until they are at an age and stage to specialise.
- Leave talent identification and development as late as possible.
- Expose young people to as many different sporting experiences as possible (eg rotate positions and teams).

While achieving and responding to challenges, young people must also have fun. It is not in their best interest to have them concerned at an early age about whether they are going to make the elite ranks.

This concern could manifest in overdoing training and competition and be counter productive. Let them enjoy moving up the pathways to success.

Key Message

Young people grow and mature at different rates. Understanding the implications of this can make sports participation more rewarding and safer for young people if sports providers

- adapt activities to their changing needs especially during periods of rapid growth
- judge performance according to a young person's stage of development, and not by what others of the same age can do
- leave decisions about specialisation as late as possible so best choices are made for the young person.

Uncle Tobys GO Swim

Key Points - Growth and Maturation

- Growth and maturation vary greatly in young people making chronological age a poor indicator of developmental status.
- Young people should be encouraged to participate in a wide range of sporting activities.
- Late maturers and young people small for their age can be discouraged in sport and may not get a chance to develop their talent.
- During growth spurts training and competition need to be planned carefully to avoid injury.
- The risk of bone fracture, growth plate injuries, and soft tissue injuries increases during rapid growth.
- Girls who under-eat while training intensely run the risk of stress fractures and in later life, osteoporosis.
- Training and competition schedules need to be planned around the holistic needs of each individual athlete.
- Early specialisation reduces athleticism (competence in a broad range of motor skills) and can lead to early burnout.
- Taking care of young people with regard to practice and training schedules and when they specialise in their sport is important to
 - ◇ keep young people in sport for the long term
 - ◇ make sure no potentially talented young people are lost to the sport.

The Uncle Tobys GO Swim program is designed for young people aged 6 to 11 years to encourage them to become involved in the sport of swimming, once they have learnt to swim.

Aims are to

- match young people according to their experience in the sport rather than age
- emphasise fun and learning skills
- introduce young people to competition with the focus on participation rather than winning

Special events form part of the Uncle Tobys GO Swim program and aim for all involved to have a positive experience. Included are technique races, where the GO Swimmers are judged on their technique rather than speed.

General clinics are also conducted where skills are practised and improved. Care is taken to group children with others of similar ability.

Uncle Tobys GO Swim is delivered by registered service providers who are qualified and experienced teachers/coaches. They work at a local level with swimming clubs to provide a pathway for the GO Swimmers once they move on from the program.

Major objectives are to

- give GO Swimmers opportunities for fun in the sport and
- provide pathways for further involvement in either competitive or recreational sport.

Further reading

Briefing Paper

3 *Growth and Maturation in Juniors*

Case Study

Uncle Tobys GO Swim illustrates the use of ability rather than age to group young people for activities including competition.

Resources

American Academy of Pediatrics *Policy Statement: Strength Training by Children and Adolescents*
www.AAP.ORG/policy/re0048.htm