

The following *Moving Scales* provide a guideline on how to utilize the Physical, Mental, Cognitive and Emotional Development Characteristics tables, pointing out the overlaps at the various stages of LTAD.



Late Childhood - Physical Development

| Basic characteristics | General impact on performance | Implications for the coach |
|---|---|--|
| Heart size is increasing in relation to rest of body. | Endurance capacity is more than adequate to meet the demands of most activities. | Understand that the child has the capacity to keep going. |
| Anaerobic system is not developed. | There is a limited ability to work anaerobically. | Plan short duration anaerobic activities. The ability to hold breath must be practiced and built up gradually. |
| A child's metabolism is less economical than an adult's. | Children use more oxygen whether it's expressed in absolute values or prorated for body weight. | Do not expect younger children to keep up with older children. |
| Large muscle groups are more developed than smaller ones. | The child is skilful in movement requiring the use of the large muscle groups. | Emphasize the development of general motor skills involving the large muscle groups. Then gradually introduce more precise, co-ordinated movements requiring the interaction of smaller muscle groups. |

| Basic characteristics | General impact on performance | Implications for the coach |
|--|---|---|
| Children have a shorter tolerance time for exercise in extreme temperatures. | Children may show symptoms of overheating or hypothermia more quickly. | To acclimatize children will take longer so longer warm-ups may be required. Watch closely for signs of distress caused by extremes of temperature. |
| Children subjectively feel able to be active in the heat before physiological adaptation has occurred. | | Postpone or restrict exercise in heat or humidity and ensure that plenty of fluids are ingested. Thirst is not a good indicator of fluid need. |
| Motor patterns become more refined and the balance mechanism in the inner ear gradually matures. | Great improvement in agility, balance, co-ordination, and flexibility occurs towards the end of the stage. | Emphasize co-ordination and kinaesthetic sense when doing activities. Balance in the water using buoyancy aids is one way to develop these abilities. |
| Strength develops by the improvement in the neural pathways. | There is apparent improvement in strength not brought about by the neuro-muscular adaptations of muscle fibres. | Plan coordination activities. |

Late Childhood - Mental and Cognitive Development

| Basic characteristics | General impact on performance | Implications for the coach |
|--|--|---|
| The attention span gradually increases. | Children cannot listen or stay still for long periods. | Provide short and precise instructions. Devise strategies to ensure children are listening. Children learn well by imitating and practicing correctly-modelled movements. |
| Children are enthusiastic and often impatient. | Children want to move and not listen. | Do not bombard children with technical information. Give only sufficient detail for the activity to be undertaken. Keep the fun. |
| Children have very limited reasoning ability. | Children love to be led. | Direct the training and give it a tight focus with activities that are fun and well planned. Introduce imaginative ways of achieving performance goals. |

| Basic characteristics | General impact on performance | Implications for the coach |
|---|--|--|
| Children enjoy the repetition of activities and improve through experience. | Skill learning must be directed; children do not learn correctly just by trial and error. | Provide correct demonstrations of the basic sport skills. Personal demonstrations must be accurate. |
| Children establish their preferred learning style. | Learning is through verbal, visual, or manual means. Most children are doers! | Use a variety of learning styles to suit individual needs. |
| Imagination is blossoming. | Creativity should be encouraged. | Allow the children to play and experiment. Use their ideas to create exciting sessions. Structure to encourage individuality and creativity. Sport provides an excellent vehicle for expression. |
| Language skills may be limited but are improving. | Children can't make corrections to their performance unless they understand what is being asked of them. | Use terminology that can be easily understood. Gradually introduce technical terminology. Children love long words. |

Late Childhood - Emotional Development

| Basic characteristics | General impact on performance | Implications for the coach |
|--|--|---|
| Children like to be the centre of attention. | | Develop this characteristic. Plan activities that guarantee success. Always move from simple to more complex when teaching a skill movement. Allow children to show their skills. |
| Children are developing their self concept. | Children tend to evaluate their performance as a whole and in terms that may be black and white. (I was brilliant, or, I was useless.) | Provide positive reinforcement to build self- esteem. Children are likely to perform the actions again if they are successful and feel good about it. Build on success. |
| Children feel secure with a routine and structure to training. | Introduce change sensitively and gradually. | Build a structure that is progressive but maintains continuity. |
| Children feel secure when coaching is constant. | Children like things to be fair. | Set and maintain high levels of expectancy, but be consistent with each child. Do not let mood swings or personal situations change coaching behaviours. |

Early Adolescence - Physical Development

| Basic characteristics | General impact on performance | Implications for the coach |
|--|---|---|
| Significant proportional changes occur in bone, muscle, and fat tissue. | Athletes may temporarily lose some of their kinaesthetic awareness, their ability to 'know where they are'. | Because athletes will need to constantly change their positions, monitor carefully to ensure appropriate adaptations are being made. |
| Different parts of the body grow at different rates. Arm and leg length increases before the trunk. | Athletes may appear gangly and lose control of their extremities. | Make athletes aware of the effect of their changing body shape. Skills already refined may need to be re-learned. |
| Decreases in flexibility result directly from growth. | Movement may become restricted. | Emphasizes low stretching exercises. |
| Increases in growth and decreases in flexibility make adolescents prone to injury from acute impact. | Injury can result from exercise of an acute nature such as forced elongation of muscles during kicking and jumping or from overuse. | Vary land-based activities and activities to avoid overuse. |
| Girls begin their growth spurt between 10 and 14 years and grow at very different rates. | Athletes are very different sizes at the same age. | Be aware that age-related groupings may not be appropriate. |
| There is a significant increase in the production of red blood cells. | The oxygen transportation system is improved. | Introduce structured aerobic training to make the most of these changes. Only short duration anaerobic training is recommended. |
| The central nervous system is almost fully developed. | Agility, balance, and co-ordination are fully trainable. | Use this period for maximum improvement in skill development. |
| Abstract thinking becomes firmly established. | Adolescents should be part of decision-making processes and be more responsible for their decisions. | Base decision making for strategies on skill level. |
| A new form of egocentric thought develops. | The result may be a strong fear of failure. | Plan for success. Introduce coping strategies, including mental imagery. |
| Young people are eager to perfect their skills. | Structure successful skill learning based on individual needs. | Build on success. Be aware that athletes develop at very different rates and although early developers make early progress, include all athletes. Be aware that late developers may have greater potential. |

Early Adolescence - Emotional Development

| Basic characteristics | General impact on performance | Implications for the coach |
|--|---|---|
| Physical, mental, and emotional maturity may not develop at the same time. | Athletes who look mature may not act it. Confusion or anxiety may arise. | Develop communication skills and understanding. |
| Tensions may arise between adults and adolescents. | Adolescents need help to cope with their physical and emotional changes. | Ensure two-way communication channels are always open. Allow athletes input into the decision making. |
| Hormonal activity increases. | Athletes may experience mood swings and behaviour may change. | Communicate and accept changes, but don't let hormonal changes be an excuse for negative behaviour. |
| Social interaction between males and females becomes important. | Athletes want to form friendships and it is important to allow time for them to develop positive relationships. | Try to organize social events that allow social interaction. |

Late Adolescence - Physical Development

| Basic characteristics | General impact on performance | Implications for the coach |
|---|--|--|
| Post-menarche height begins to stabilize. Increase in height is about 5%. Stabilization of muscular system also occurs. | Muscles have grown to mature size, but increases in muscular strength continue into the 20s. | Maximize strength training to bring about overall improvement. Optimize neuromuscular training. |
| Skeletal maturation continues. | Connective tissue is strengthening. | Continue progressive overloading in training. |
| By 17, girls have generally reached adult proportions. | Girls proportionately gain more weight during this period. | Optimize aerobic training. Be aware of how to deal with weight gains. Teach athletes how to compete in varied circumstances. |
| Rate of improvement in motor ability declines. | Rate of improvement in skill development declines. | Be aware that the rate of improvement in motor ability will be slower, but improvement will still be made. |

Late Adolescence - Mental and Cognitive Development

| Basic characteristics | General consequences for performance capabilities and limitations | Implications for the coach |
|---|--|---|
| Generally by 16, the brain has reached adult size, but continues to develop neurologically. | Athletes can understand the technical requirements of their sport. | Make sure athletes understand why they are doing certain things. |
| Critical thinking becomes more established. | Athletes can make decisions about their training pathway. | Allow athletes input and reduce the amount of feedback and make athletes think for themselves. Develop awareness of performance by increasing kinaesthetic knowledge. |
| There should be complete understanding and acceptance of the need for rules, regulations, and structures. | Rules are seen in simplistic terms and must be clear and well defined. | Always be seen to be fair because adolescents have a strong sense of fairness in making decisions. Make athletes part of the decision-making process. |

Late Adolescence - Emotional Development

| Basic characteristics | General impact on performance | Implications for the coach |
|--|---|--|
| Major decisions about examinations, universities, and employment work have to be made. | There are 'pulls' on time and energy. | Build in prophylactic breaks. Be aware of external pressures. Seek professional guidance to ensure the correct career and educational pathway. |
| Peer group pressure leads to conflicting loyalties. | An athlete may give up sport because of peer pressure and the need to be seen as one of the gang. | Be sensitive in goal setting to ensure that common goals are established and met. |
| Self-actualization and self-expression are important. | | Treat athletes as adults. Share goals and work co-operatively towards them. Maintain a coach-led structure. |
| Interactions with friends of both sexes continue to be a strong priority. | | Allow time to establish independent social interaction. |

Early Adulthood - Physical Development

| Basic characteristics | General impact on performance | Implications for the coach |
|--|--|--|
| Physiologically, the body reaches maturity during this stage. | All physiological systems are fully trainable. | Ensure that physical training programs employ the most advanced techniques and sport science information to facilitate maximum adaptation and minimize injuries. |
| | | Ensure that all muscle groups and body alignments are well-balanced, complemented with optimum flexibility ranges. |
| | | Use state-of-the-art testing and monitoring programs. |
| | | Carefully monitor overtraining and overstress. |
| Final skeletal maturation in females occurs at about 19-20 years and in males about 3 years later. | | Organize regular medical monitoring Schedule additional blood tests for females in case of anemia. |

Early Adulthood - Mental and Cognitive Development

| Basic characteristics | General impact on performance | Implications for the coach |
|---|---|--|
| Neurologically, the brain matures about 19-20 years of age. | Athletes are capable of self-analyzing and correcting and refining skills. Athletes can analyze and conceptualize all facets of their sport. | Establish winning as the major objective. |
| | Well-developed information processing skills improve the athlete's ability to visualize verbal instructions. | Implement principles of adult learning. |
| There is a complete understanding and acceptance of the need for rules, regulations, and structure. | The young adult must perceive the rules and structure as being clearly defined and fair. | Involve athletes in decision making and planning team or group activities. |

Early Adulthood - Emotional development

Basic characteristics

General consequences for performance capabilities and limitations

Implications for the coach

There is a need to be self-directed and independent.

Athletes are ready to assume responsibility and accept the consequences of their actions.

Emphasize goal setting to give definite direction and purpose to the athlete's overall program.

Self-actualization and self-expression are important.

Treat athletes as adults and with respect. Remember that the coach's direction and structure remain important.

Major decisions on career, education, and lifestyle are priority at some point in this stage.

Major changes in interests, hobbies, and physical activities occur.

Make professional guidance available, considering off-season and educational pursuits.

Interactions with the opposite sex continue to be a strong priority with lasting relationships developing.

Provide athletes with ample opportunities for independent social interaction.