

# Tables of the Stages of Athlete Development

## Physical, Mental / Cognitive and Emotional Development

### 1. Late Childhood (FUNdamental Stage)

#### Characteristics of Physical, Mental/Cognitive and Emotional Development

**Table 1.**

**Table 1 / a  
Physical Development Characteristics and It's Implications**

Basic Characteristics	General Consequences: Performance Capabilities and Limitations	Implications to the Coach
Larger muscle groups are more developed than smaller ones	The child is more skilful in gross movements involving large muscle groups rather than precise coordinated movements involving the interaction of many smaller muscles	General basic skill should be developed during this phase
The size of the heart is increasing in relation to the rest of the body. The cardiovascular system is still developing	Endurance capacity of the young participants however is more than adequate for most activities (little aerobic machines)	Short duration anaerobic activities to be planned (alactic), endurance must be developed through plays and games (lack of attention span for continuous work)
Ligamentous structures are becoming stronger, but the ends of the bones are still cartilaginous and continue to calisify	The body is very susceptible to injuries through excessive stress or heavy pressure	Slow progression in hopping bounding, own body weight, medicine ball exercises (neural recruitment)
Basic motor patterns become more refined towards the end of phase and the balance mechanism in the inner ear is gradually maturing	There is great improvement in speed, agility, balance, coordination and flexibility toward the end of this phase	Specific activities and games should emphasize coordination and kinesthetic sense, gymnastics, diving, athletics filed events
During this phase, girls develop coordination skills faster than boys but there is generally there are no differences between boys and girls	Sex differences are not of any great consequences at this stage in development	Training and playing together should be emphasized at this age and phase

**Table 1 / b**  
**Mental/Cognitive Development Characteristics and It's Implications**

<b>Basic Characteristics</b>	<b>General Consequences Performance Capabilities and Limitations</b>	<b>Implications to the Coach</b>
Attention span is short and children are very much action oriented. Memory is developing in a progressive way	Young players cannot sit and listen for longer periods of time	Use short, clear and simple instructions. Children want to move and participate in action
Children in this phase have very limited reasoning ability. Later in the phase there is a growing capacity for more abstract thought	Children are generally leader oriented - loved to be lead!	Coaches should adopt a "follow me" or "follow the leader" approach and ensure that all activities are fun and well planned
The repetition of activities is greatly enjoyed. Young players improve their abilities through experience	Children do not learn the skills correctly just by trial and error	Coaches <b>must</b> be able to provide a correct demonstration of basic the skills required at this level
Imagination is blossoming	Experimentation and creativity should be encouraged	While playing and practicing encourage input (opinion) from the children. They love to try new things and ready to try almost anything

**Table 1 / c**  
**Emotional Development Characteristics and It's Consequences**

<b>Basic Characteristics</b>	<b>General Consequences Performance Capabilities and Limitations</b>	<b>Implications to the Coach</b>
The child's self concept is developing at this phase by experiences and comments from others	Youngsters perceive these experiences as a form of self evaluation. "I am a good person if I do well I'm a bad person I do poorly".	On a regular basis they need <b>positive reinforcement</b> from the coach. This will provide strong motivation to continue with the activity.
Children like to be the centre of focus and attention	When situation becomes threatening, they quickly lose confidence	Select technical and tactical activities in which success is virtually guaranteed, gradual progress from simple to complex.
The influence of peers becomes a very strong driving force behind all activities	Acceptance into the peer group often depends upon one's abilities in physical skills and activities.	At this phase the coach must be capable of properly assessing the basic skills and providing a varied repertoire of practical opportunities for technical and tactical development and improvement.
The child begins to understand the need for rules and structure.	They can understand and play simple games with simple rules and will tend to question rules and expect thoughtful answers.	Participation and <b>fun</b> to be emphasized versus winning. <b>Focus on the processes not on the outcome (and have lots of FUN)!</b>

## 2. EARLY PUBERTY

### Learning to Train and Training to Train Stages

**Table 2.**  
**Characteristics of Physical, Mental/Cognitive and Emotional Development**

**Table 2 / a**  
**Physical Development Characteristics and It's Implications**

Basic Characteristics	General Consequence: Performance Capabilities and Limitations	Implications to the Coach
Significant proportional changes occur in bone, muscle and fat tissue.	During growth spurts adaptation is influenced by sudden changes of body proportions	Monitor training carefully and individualize the content of training to ensure adaptation.
Girls begin their growth spurt between the ages of 12.5-14 years, boys between 12.5-15 years. Girls attain a maximum rate of growth at an average age of 11, boys at an average age of 14 years.	Early in this phase, girls are faster and stronger than boys, later in the phase boys are becoming faster and stronger than girls.	Chronological age may not be the most appropriate way to group players.
Primary and secondary sex characteristics manifest themselves during this period. The normal range for onset of menarche for girls can be anywhere from 10-16 years.	After the onset of menarche iron levels of girls should be monitored regularly.	Situations when fear, guilt or anxiety brought about by sexual development should be avoided.
Smaller muscle groups are becoming more developed	Speed, agility and coordination are still improving rapidly during this stage.	With the improvement of fine motor movement all basic technical skills to be mastered. Players should learn how to train, during this phase, including physical, technical, tactical and ancillary capacities.
During this developmental phase the various parts of the body do not grow at the same rate. The growth rate of the legs and arms will reach a peak prior to that of the trunk.	A change in the centre of gravity, length of limbs and core strength will determine the content of training.	Some of the already learned skills have to be refined (re-learned) again, since the growth of limbs will impact the technique.
A significant increase in red blood cells occurs during this phase, especially in boys due to the male hormone testosterone.	The oxygen transportation system is still developing and aerobic endurance is continuing to increase.	The increase in body mass requires more structured aerobic training. Only short duration of anaerobic activities are recommended.
The central nervous system is almost fully developed.	Agility, balance and coordination is fully trainable.	Use the warm up to further development of CNS activities.

**Table 2 / b**

**Mental/Cognitive Development Characteristics and It's Implications**

<b>Basic Characteristics</b>	<b>General Consequence: Performance Capabilities and Limitations</b>	<b>Implication to the Coach</b>
Abstract thinking becomes more firmly established.	Decision-making through more complex technical training should be introduced.	Decision-making on tactical and strategical solution should be based upon the skill level of the player.
Young players develop a new form of egocentric thought. Much emphasis is placed upon self-identity.	This may result in a strong fear of failure.	Create optimum learning environment, match skill and drill levels. Introduce simple coping strategies, concentration skills and mental imagery.
Young players are eager to perfect his/her skills.	Individual specific direction and structure in the learning process is required. A variety of methods to measure success are important to maintain motivation.	Positive reinforcement is imperative. The difference between the physical and mental development can vary to a great extent, the coach must be particularly careful not to pick the early developers and neglect or de-select the late developers. The coach's ability to demonstrate specific skills is important. Audiovisual material and video feedback will help to create a mental image.

**Table 2 / c**

**Emotional Development and It's Implications**

<b>Basic Characteristics</b>	<b>General Consequence: Performance Capabilities and Limitations</b>	<b>Implications to the Coach</b>
There is a tremendous influence on behavior from peer groups.	Values and attitudes are being created and reinforced by the group.	The coach should exercise strong direction and supervision. A role model for young players at this phase is very important.
During this phase players are capable of cooperating and accepting some responsibility	Some players may be less responsible mainly due to a fear of failure.	Coach must have an open communication with the players.
Tension generally exists between adults and adolescent.	Communication channels should be kept open by the adult, as all teenagers need help even though they do not recognize the need, or seem grateful for the help.	Coach is usually better accepted than other adults and should always attempt to foster two-way communication. Young players should have an input into decision-making processes.
It is important that young players at this developmental level be able to display tenderness, admiration and appreciation.	Deprivation of these qualities often leads to exaggerated and/or unacceptable behavior.	Early maturers often become leaders and excel in physical performance. Coaches must not play favorites as this can have negative effects on other participants' development.
Physical, mental and emotional maturity do not necessarily develop at the same rate.	Feelings of confusion or anxiety may exist as a result.	The coach's communication skills and understanding are important in these regards.
There is a desire to have friends of the opposite sex.	Social activities are important events for this age group.	Co-educational activities are recommended.

### 3. LATE PUBERTY

#### Training to Train and Training to Compete Stages

**Table 3.**  
**Characteristics of Physical, Mental/Cognitive and Emotional Development**

**Table 3 / a**  
**Physical Development Characteristics and its Implications**

Basic Characteristics	General Consequence: Performance Capabilities and Limitations	Implication to the Coach
The circulatory and respiratory system reach maturity	These systems are generally capable of giving maximum output.	Aerobic and anaerobic systems can be trained for maximum output. Full sport specific energy system training should be implemented.
Increase in height and weight gradually lessen. Stabilization occurs in the muscular system.	Muscles have grown to their mature size but muscular strength continues to increase reaching its peak in the late twenties.	Strength training can be maximized to improve overall strength development. Neuromuscular training should be optimized during this phase.
Skeletal maturation continues in males and females.	Connective tissues are still strengthening.	Progressive overloading in training should be continued.
By age 17, girls have generally reached adult proportions, whereas boys do not reach such proportions until several years later.	Proportionally girls gain more weight than boys during this phase.	Aerobic training for girls to be optimized, as well coaches should be aware how to deal with weight gain and it's impact on figure. Players should learn how to compete including all technical, tactical and ancillary components.

**Table 3 / b**  
**Mental/Cognitive Development Characteristics and its Implications**

<b>Basic Characteristics</b>	<b>General Consequence: Performance Capabilities and Limitations</b>	<b>Implications for the Coach</b>
Generally, by age 16, the brain has reached its adult size but continues to mature neurologically for several more years.	Players can cope with multiple strategies and tactics, particularly near the end of the phase.	Coaches should ensure the refinement of all technical and tactical skills.
Critical thinking is developing well during this phase.	The capacity of self-analysis and correction is developing.	Decision-making should be developed further through technical, tactical development.

**Table 3 / c**  
**Emotional Development Characteristics and its Implications**

<b>Basic Characteristics</b>	<b>General Consequence: Performance Capabilities and Limitations</b>	<b>Implications to the Coach</b>
Peer group influence is still a powerful force.	Independent decision-making and leadership skills are becoming more developed.	Players should be given the opportunity to develop through participation in appropriate leadership or responsible role, (i.e. team captain, athlete representative, etc.) but strong direction and discipline must be maintained.
Players are searching for a stable, balanced self-image.	Self is still very susceptible to successes and failures. Coping techniques are useful.	Positive evaluation of performances and positive reinforcement are imperative.
Activities and interaction with the opposite sex play strong roles during this phase.	Male players must be aware that female athletes now face a problem of femininity versus sport development. Female players must be aware that male athletes now face a problem of relating performance to masculinity.	Facilitate the recognition of the former issues through education and club programs.

## 4. EARLY ADULTHOOD

### 5. Training to Compete and Training to Win Stages

**Table 4.**  
**Characteristics of Physical, Mental/Cognitive and Emotional Development**

**Table 4 / a**  
**Physical Development Characteristics and its Implications**

Basic Characteristics	General Consequence: Performance Capabilities and Limitations	Implication to the Coach
Physiologically the body reaches maturity during this phase.	All physiological systems are fully trainable.	Physical training programs should 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.  State of the art testing and monitoring program to used.  Overtraining and overstress should be carefully monitored.
Final skeletal maturation in females occurs at about 19-20 years and in males about three years later.		Regular medical monitoring should be organized with additional blood tests for female players (anemia).

**Table 4 / b**

**Mental/Cognitive Development Characteristics and its Implications**

<b>Basic Characteristics</b>	<b>General Consequence: Performance Capabilities and Limitations</b>	<b>Implication to the Coach</b>
Neurologically the brain matures about 19-20 years of age.	Players are capable of self-analyzing and correcting and refining skills. Athletes can analyze and conceptualize all facets of their sport.	Winning becomes the major objective.
	Well-developed information processing skills improve the players ' ability to visualize verbal instructions.	Principles of adult learning should be implemented at this level.
There is a complete understanding and acceptance of the need for rules, regulations and structure.	However, the young adult must perceive the rules and structure as being clearly defined and fair.	Involve the players in decision making and planning of team or group activities.

**Table 16 / c**

**Emotional Development Characteristics and its Implications**

<b>Basic Characteristics</b>	<b>General Consequence: Performance Capabilities and Limitations</b>	<b>Implication to the Coach</b>
There is a need to be self directed and independent.	The players are ready to assume responsibility and accept the consequences of their actions.	Goal setting should be strongly emphasized to give definite direction and purpose to the athletes overall program.
Self-actualization and self-expression are important.		The athletes need to be treated as adults, with respect. Direction and structure provided by the coach is still important.
Major decision on career, education and lifestyle are priority at some point in this phase.	Major changes in interests, hobbies and physical activities occur during this phase.	Professional guidance should be made available considering off-season and educational pursuits.
Interactions with the opposite sex continue to be strong priority with lasting relationships developing.		Athletes must have ample opportunities for independent social interaction.

## Terminology:

### British Swimming and ASA

- Late childhood – Table 1
- Early puberty – Table 2
- Late puberty – Table 3
- Early adulthood – Table 4

### International Gymnastics Federation

- Pre-pubertal – age 6 - 11
- Early pubertal – age 11 – 13
- Late pubertal – age 12 – 16
- Post pubertal – age 15 +  
(Overlap is due to early or late maturation)

### In general

- Late childhood
- Adolescences
  - Early puberty
  - Late puberty
- Early adulthood

### Zaichkowsky, Zaichkowsky and Martinek: Growth and Development 1980

- Infant                      Birth to 2 years
- Early childhood      2 to 5 years
- Late childhood      5 to 10
- Adolescence          10 to 18
- Adult                      18 to 40
- Middle age              40 to 60
- Old age                  60 years and over

## Physical, Mental/Cognitive and Emotional Tables

<b>FUNdame ntal</b>	<b>Learning to Train</b>	<b>Training to Train</b>	<b>Training to Compete</b>	<b>Training to Win</b>
<b>Late Childhood</b>		<b>Late Puberty</b>		
	<b>Early Puberty</b>		<b>Early Adulthood</b>	