Chapter 19
How Physical Fitness Changes During Growth:
Activity and Biological Maturation

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ABSTRACT

Growth is one of the most fashioning phenomena in the biological context. In this brief report, a vision between growing and exercise practice is found. Human maturation is controlled by internal biological factors focused not only to development of stature, muscle mass, and strength, but human maturation regards, also, the development of the central and peripherical nervous systems and the sprouting of synapses between neurons and basal ganglia that lead to high motor control during physiological outcomes. Thus, the trends of maturation become important to be accurate during Physical Education proposal. For example, precaution in the use of overload before 18 years, funny game for endurance performance or activity centered on general skill at high speed are in the authors' opinion valid suggestions. In the absence of pathological condition or scant nutrition, all children can follow constant practice according to scientific evidence.

INTRODUCTION

The human growth is one of the most fashioning phenomenon in biological context. In fact, the growth of organs and structures is an evident condition that lasts all life long, keeping at the same time, the function. In particular, the umbrella term growth refers to the increase in physical size of the body while skills and functions follow parallel improvements. Growth and development are considered together because the child grows and develops simultaneously. The whole body conserve the function (modulate is a more specific verb) and contemporary improve the size, the volume or the structure of organs is a great ability of the animals.

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In point of this, become very interesting observe the growth and verify the level of function because all outcomes depend on the intrinsic relationship between specific anatomy morphology of organ/structure (heart, bone, muscles, central nervous system…) and the physiological function (Tanner et al., 1970).

How could be the performance of a children in jump or in run exercise during growth? How modulate the load during training session for children during the most important period of their life? What about the limit in physical practice during the definition of bone maturity or during peak of hormone production?

In the next page, we can try a general vision on the relationship between growing and exercise practice to understand the relationship across developmental stages. Perspective and highlights useful for the professions.

In particular, some suggestion for Physical Education classes will be present because considered crucial for curriculum development and teaching practices.

BACKGROUND

Before the analysis of physical performance according to growing is important give a simple definition of growth/development. Growth, following the popular speech, is the process of becoming mature (Viru et al., 1999) and is different among children for timing (when the maturation begins) and flow (rate at which it progresses). It is the process from childhood to adult stature (see fig. 1 about girls) through the adolescence (Sherar et al., 2005) that is defined as a turbulence period where the most important hormonal (fig. 2) and physical changes begin to occur (Malina, 2014).

Growth is the normal process of increase in size and represent the dominant biological activity for the first two decades of life. These changes are the outcome of an increase in cell number (hyperplasia), in cell size (hypertrophy) and an increase in intercellular substances (accretion).

Figure 1. Trend of stature in female gender. Modified: WHO Reference, 2007