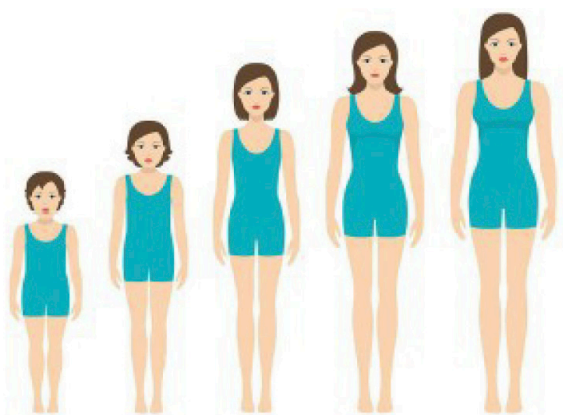


WHAT IS PUBERTY?

ATHLETE INFORMATION SHEET

What is puberty and what causes it?

- Puberty for girls is not just about the start of menstrual periods.
- Puberty is the process of change through which a child's body matures into an adult's body capable of sexual reproduction. It can begin at any time between the ages of 8 and 15 and the trigger is often predetermined by genetics while it can also be greatly influenced by an individual's nutritional status.
- Puberty starts when the hypothalamic part of the brain increases its release of a key hormone (GnRH). GnRH then causes an increase in the release of hormones from the pituitary gland at the base of the brain (specifically Luteinising Hormone (LH) and Follicle Stimulating Hormone (FSH)), which in turn act on the ovaries (located in the pelvis).
- In women, puberty starts with breast budding, then hair growth in the pubic areas and armpits prior to the start of periods (this is known as menarche).



What happens during puberty in athletic girls

1. Growth accelerates

At puberty there is a growth spurt and up to 10-15cm can be gained each year. Phases of rapid growth may occur more than once with slowed growth in-between. Often the hands, arms, feet, and legs grow in advance of the rest of the body which may cause clumsiness in a teenage girl. Rapid growth will cause significant changes to an athlete's centre of gravity and the brain needs time to adjust to allow for optimal balance and movement – this change may temporarily impact upon sports performance.

2. The pelvis broadens

A girl's pelvis broadens in preparation for childbearing which alters the angle between the hip, knee, and foot (the so-called Q- angle). The increased Q-angle can predispose to overuse type knee injuries and may also temporarily reduce speed and power during puberty.

3. Body fat increases

Body fat is laid down on the belly, legs, buttocks, and breasts changing how young women may feel when active. This may also affect how an athletic young woman perceives her body.

4. The elbow 'carrying' angle increases

The arms in women don't hang straight down but are angled away from the body at the elbow. This can alter how the arms are used in sports such as running or throwing, sometimes requiring an evolution of technique.

5. Muscle development accelerates

Gains in muscle strength may place the ends growing bones at risk of excessive strain, and careful management of training loads is required to minimise the chance of over use injury.

6. Bone density Increases

Bone density and bone strength increase. This is critical in avoiding getting thin and weak bones (osteoporosis) later in life.

Regular short bouts of weight bearing activity are important to maximise bone density at this time. However, while the bones are growing, there is also a higher risk of injuries such as stress fractures to the bone - especially if training is too heavy or repetitive.

7. Increased nutritional needs

With the rapid growth occurring during puberty, nutritional needs also change. There is a risk of consuming too little energy (i.e. not enough of the right food) for the bodies energy demands. The post training meal becomes far more important to help optimise bone and muscle growth.

8. The skin changes and adult hair patterns develop

In puberty the skin becomes more oily and sweating increases. Pubertal hair growth occurs under the arms, in the genital area and there is thickening of hair on the limbs. This combination can lead to acne and skin infections which in turn may impact on appearance, confidence and mood.

9. Menstrual periods begin

Please see the HPSNZ WHISPA Information sheet on the menstrual cycle.

10. Brain development

During puberty, the gradual development of abstract thinking increases the ability to understand strategy and reasoning.

11. Possible mood variations

Evolving hormonal cycles may result in some young women experiencing mood fluctuations.

12. Psycho-social development

The combination of body shape changes, skin appearance, brain development, transient clumsiness or awkwardness, reduced performance, and mood variations, can alter the way pubertal women view themselves and others.

Young women may develop an increased awareness of how others perceive them and may compare themselves to others. Subsequently, relationships with others and peer acceptance can influence thoughts and actions.