The life-course of the muscular-skeletal system

Level 2 Anatomy and physiology for exercise and fitness instructors

Learning outcomes

By the end of this session you will be able to:

- Describe the life-course of the musculoskeletal system, and its implications for special populations exercise

Young people – 13-18 years

Considerations:

- Skeletal development (endomorphs, ectomorphs, mesomorphs)
- Growth and development of the spine
- Maturation of the skeletal system
- Ossification (primary and secondary sites)
- Implications for the incomplete fusing of the epiphyseal plate
- Growth plate damage
- Fractures
- Growth spurts
- Considerations for exercise – suitable exercise

Consideration for exercise for young people 13-18 yrs

- Caution should be taken when teaching any stretch exercise especially during a growth spurt. There is an increased injury risk as the soft tissue around the joints is already stretched as muscle growth does not keep up with bone growth rates
- Some adolescents will not have gained sufficient motor skills to develop their flexibility with good technique
- Heavy, strenuous or highly repetitive exercise should be avoided
- Resistance training in adolescents has the potential to offer observable health and fitness gains in sports performance, bone health and body composition
- Sessions for young people need to be kept fresh and challenging with plenty of variation

Older people – 50 plus years

Considerations:

- Ageing and the skeletal system
- Hormone changes
- Loss of bone mass
- changes in osteoblast/osteoclast activity
- Implications of reduction in bone-mineral density and connective tissue
- Osteopenia/osteoporosis/osteoarthritis
- Hyaline cartilage wear and tear
- Increase risk of falls and fractures
- Joint degeneration
- Reduced range of motion

Consideration for exercise for older people 50+

- Spend longer warming-up and cooling-down
- Keep the intensity of all training components to a challenging level but without pain or strain and within their personal training zone
- Ensure correct technique for injury prevention
- Take more time during transitions e.g. floor to standing
- Simplify exercise when correct technique cannot be maintained and risk is increased
- Avoid extreme spinal flexion

Ante and post-natal

Considerations:

- Skeletal system changes including potential postural changes
- Hormone changes – effect of relaxin and other hormones
- Changes affecting balance

Considerations for exercise including:

- Warning signs
- Suitable exercise pre -16 week and post-16 weeks and post-natal