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## Ageing - muscles bones and joints

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### Summary

- At least half of the age-related changes to muscles, bones and joints are caused by disuse.
  - Recent studies show that fewer than one in 10 Australians over the age of 50 years do enough exercise to improve or maintain cardiovascular fitness.
  - See your doctor before starting any new exercise program.
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Some age-related changes, such as wrinkles and grey hair, are inevitable. It was once thought that changes to muscles, bones and joints were unavoidable too. However, researchers now suggest that many factors associated with ageing are due to **inactivity**, and that performing physical activity can help to reduce or reverse the risk of disability and chronic disease.

### Muscle and bone conditions in older age

Nearly half of all Australians over the age of 75 years have some kind of disability. Common conditions affecting muscles and the skeleton, or the musculoskeletal system, in older people include:

- **osteoarthritis** – the cartilage within the joint breaks down, causing pain and stiffness
- **osteomalacia** – the bones become soft, due to problems with the metabolism of vitamin D
- **osteoporosis** – the bones lose mass and become brittle. Fractures are more likely
- **rheumatoid arthritis** – inflammation of the joints
- **muscle weakness and pain** – any of the above conditions can affect the proper functioning of the associated muscles.

### Age-related changes in muscle

Muscle loses size and strength as we get older, which can contribute to fatigue, weakness and reduced tolerance to exercise. This is caused by a number of factors working in combination, including:

- Muscle fibres reduce in number and shrink in size.
- Muscle tissue is replaced more slowly and lost muscle tissue is replaced with a tough, fibrous tissue.
- Changes in the nervous system cause muscles to have reduced tone and ability to contract.

### Age-related changes in bone

Bone is living tissue. As we age, the structure of bone changes and this results in loss of bone tissue. Low bone mass means bones are weaker and places people at risk of breaks from a sudden bump or fall.

Bones become less dense as we age for a number of reasons, including:

- An inactive lifestyle causes bone wastage.
- Hormonal changes – in women, menopause triggers the loss of minerals in bone tissue. In men, the gradual decline in sex hormones leads to the later development of osteoporosis.
- Bones lose calcium and other minerals.

### Age-related changes in joints

In a joint, bones do not directly contact each other. They are cushioned by cartilage that lines your joints (articular cartilage), synovial membranes around the joint and a lubricating fluid inside your joints (synovial fluid). As you age, joint movement becomes stiffer and less flexible because the amount of lubricating fluid inside your joints decreases and the cartilage becomes thinner. Ligaments also tend to shorten and lose some flexibility, making joints feel stiff.

Many of these age-related changes to joints are caused by lack of exercise. Movement of the joint, and the associated 'stress' of movement, helps keep the fluid moving. Being inactive causes the cartilage to shrink and stiffen, reducing joint mobility.

### **Physical activity can help**

Exercise can prevent many age-related changes to muscles, bones and joints – and reverse these changes as well. It's never too late to start living an active lifestyle and enjoying the benefits.

Research shows that:

- Exercise can make bones stronger and help slow the rate of bone loss.
- Older people can increase muscle mass and strength through muscle-strengthening activities.
- Balance and coordination exercises, such as tai chi, can help reduce the risk of falls.
- Physical activity in later life may delay the progression of osteoporosis as it slows down the rate at which bone mineral density is reduced.
- Weight-bearing exercise, such as walking or weight training, is the best type of exercise for maintenance of bone mass. There is a suggestion that twisting or rotational movements, where the muscle attachments pull on the bone, are also beneficial.
- Older people who exercise in water (which is not weight bearing) may still experience increases in bone and muscle mass compared to sedentary older people.
- Stretching is another excellent way to help maintain joint flexibility.

See your doctor before you start any new physical activity program. If you haven't exercised for a long time, are elderly or have a chronic disease (such as arthritis), your doctor, physiotherapist or exercise physiologist can help tailor an appropriate and safe exercise program for you. If you suffer from osteoporosis, you may also be advised to take more calcium. Sometimes, medications are needed to treat osteoporosis.

### **Where to get help**

- Your doctor
- Physiotherapist
- Exercise physiologist

### **Things to remember**

- At least half of the age-related changes to muscles, bones and joints are caused by disuse.
- Recent studies show that fewer than one in 10 Australians over the age of 50 years do enough exercise to improve or maintain cardiovascular fitness.
- See your doctor before starting any new exercise program.

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