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.

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...
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.

References

- Exercise and physical activity – your everyday guide from the National Institute on Aging, National Institute on Aging, USA. More information here.
- Aging changes in the bones – muscles – joints, University of Maryland Medical Center, USA. More information here.
- The benefits of exercise, Centre for Physical Activity in Ageing, Royal Adelaide Hospital Health Services, South Australian Government. More information here.
- Active for later life: Promoting physical activity with older people, British Heart Foundation National Centre for Physical Activity and Health, UK. More information here.

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More information

Bones muscles and joints

The following content is displayed as Tabs. Once you have activated a link navigate to the end of the list to view its associated content. The activated link is defined as Active Tab

- Bone muscle and joint basics
- Healthy bones muscles and joints
- Bone and bone marrow conditions
- Osteoporosis
- Muscle conditions
- Joint conditions
- Hand and foot conditions
- Back neck and spine conditions

Bone muscle and joint basics

- Bone marrow
  Bone marrow is the spongy tissue in the hollow centres of a person's long bones and is the blood cell 'factory'.
- Bones
  The adult skeleton is made up of 206 bones, which provide the structure for our bodies.
- Choosing the right shoe
  The right footwear can help keep your feet healthy, make your physical activity easier and help keep your body safe from injury.
- Growth hormone
Some athletes and bodybuilders wrongly believe that taking synthetic growth hormone will help build up their muscles.

- **Joints**
  A joint is the part of the body where two or more bones meet to allow movement.

- **Locomotor system**
  The skeleton and skeletal muscles work together to allow movement.

- **Muscles**
  There are about 600 muscles in the human body.

### Healthy bones muscles and joints

- **10 tips for getting enough vitamin D**
  A balanced UV approach is required to ensure some sun exposure for vitamin D while minimising the risk of skin cancer.

- **10 tips for safe stretching**
  Make stretching part of your life.

- **10 tips on how to eat more calcium**
  Reduce your intake of coffee, alcohol and soft drinks.

- **Aging - muscles bones and joints**
  Exercise can prevent age-related changes to muscles, bones and joints and can reverse these changes too.

- **Bone density testing**
  Most procedures that measure bone density are quick and pain-free.

- **Calcium**
  If you don't have enough calcium in your diet, your bones will eventually become weak and brittle.

- **Choosing the right shoe**
  The right footwear can help keep your feet healthy, make your physical activity easier and help keep your body safe from injury.

- **Posture**
  Bad habits such as slouching and inactivity cause muscle fatigue and tension that ultimately lead to poor posture.

- **Vitamin D**
  A balanced approach to sunlight exposure will help you get enough vitamin D while protecting against skin cancer.

- **Vitamin D - maintaining levels in winter (video)**
  Vitamin D is important for healthy bones, muscles and the nervous system.

### Bone and bone marrow conditions

- **Acromegaly**
  Acromegaly is caused by an excess of growth hormone in adults, which causes the overgrowth of bones in the face, hands, feet and internal organs.

- **Amyloidosis**
  A person with amyloidosis produces aggregates of insoluble protein that cannot be eliminated from the body.

- **Bone cancer**
  Bone cancer is a rare form of cancer that is treated with chemotherapy, radiotherapy or hormone therapy.

- **Bone fractures**
  Common sites for bone fractures include the wrist, ankle and hip.

- **Fibrous dysplasia**
  Fibrous dysplasia causes abnormal growth or swelling of bone, but it is not a form of cancer.

- **Leukaemia**
  Most children and many adults with acute leukaemia can expect to be cured, while chronic leukaemia can be successfully managed.
**McCune-Albright syndrome**

The severity of symptoms or how a child with McCune-Albright syndrome will be affected throughout life is difficult to predict...

**Multiple myeloma**

Multiple myeloma is cancer of plasma cells in the bone marrow...

**Osteomyelitis**

Osteomyelitis means an infection of bone which can either be recent or longstanding...

**Paget's disease of bone**

Paget's disease of bone is a chronic condition that causes abnormal enlargement and weakening of bone...

**Rib injuries**

Rib injuries may include bruises, torn cartilage and bone fractures...

**Rickets**

Rickets is a preventable childhood bone disease caused by a lack of vitamin D...

**Scoliosis**

Scoliosis is an abnormal sideways curve of the spine...

**Shin splints**

'Shin splints' refers to pain felt anywhere along the shinbone from knee to ankle...

**Treacher Collins syndrome**

Treacher Collins syndrome is a genetic disorder that affects growth and development of the head, causing facial defects and hearing loss...

**Osteoporosis**

- **Menopause and osteoporosis**
  
  Regular weight-bearing exercise and maintaining a diet rich in calcium from childhood will help reduce bone loss at menopause...

- **Osteoporosis**
  
  A healthy, calcium-rich diet and regular physical activity throughout life can help prevent osteoporosis...

- **Osteoporosis and exercise**
  
  Exercise can reduce the risk of fractures resulting from osteoporosis by both slowing the rate of bone loss, and reducing the person's risk of falling by building muscle strength and improving balance...

- **Osteoporosis in children**
  
  Osteoporosis in children is rare and usually caused by an underlying medical condition...

- **Osteoporosis in men**
  
  Up to 30 per cent of all fractures that occur in people with osteoporosis and osteopenia, occur in men...

**Muscle conditions**

- **Bell's palsy**
  
  The majority of people with Bell's palsy, around 90 per cent, will recover completely with time...

- **Helping a child with a disability with everyday activities**
  
  If you have a child with a disability you can help improve their communication and movement by encouraging them to take part in daily activities...

- **Multiple sclerosis (MS)**
  
  Multiple sclerosis is not contagious, but it is progressive and unpredictable...

- **Muscle cramp**
  
  A muscle cramp is an uncontrollable and painful spasm of a muscle...

- **Muscular dystrophy**
  
  People affected by muscular dystrophy have different degrees of independence, mobility and carer needs...

- **Myasthenia gravis**

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Myasthenia gravis is an autoimmune disease that causes muscle weakness.

- **Polymyositis**
  Polymyositis is hard to diagnose and may be mistaken for muscular dystrophy.

- **Spinal muscular atrophy (SMA)**
  A child with spinal muscular atrophy type 1 rarely lives beyond three years of age.

- **Sprains and strains**
  It is important to get the correct treatment for a sprain or strain as soon as possible after the injury to help you recover quickly.

**Joint conditions**

- **Ankle sprain**
  Ankle sprain is a common sports injury caused by overstretching and tearing the supporting ligaments.

- **Ankylosing spondylitis**
  Ankylosing spondylitis (AS) is a type of inflammatory arthritis that targets the joints of the spine.

- **Arthritis explained**
  People can manage their arthritis using medication, physiotherapy, exercise and self-management techniques.

- **Baker's cyst**
  Baker's cysts of the knee don't always require active treatment and sometimes will only require observation by the treating doctor.

- **Bursitis**
  Bursitis is often caused by overuse and the inflammation will continue unless the particular activity or movement is stopped.

- **Carpal tunnel syndrome**
  Carpal tunnel syndrome can be caused by repetitive hand movements, pregnancy and arthritis.

- **Developmental dysplasia of the hip (DDH)**
  Around 95 per cent of babies born with developmental dysplasia of the hip can be successfully treated.

- **Elbow pain**
  Elbow pain can result from overuse in a range of sports or occupations.

- **Hip disorders**
  The hip joint is complicated to allow a wide range of motion while still supporting the weight of the body.

- **Knee injuries**
  Mild knee injuries may heal by themselves, but all injuries should be checked and diagnosed by a doctor or physiotherapist.

- **Osgood-Schlatter syndrome**
  Osgood-Schlatter syndrome is a painful knee condition that affects adolescents.

- **Perthes' disease**
  Most children with Perthes' disease eventually recover, but it can take anywhere from two to five years.

- **Reactive arthritis**
  Reactive arthritis is a form of arthritis that occurs as a result of some bacterial infections.

**Hand and foot conditions**

- **Achilles tendinitis**
  People who run regularly seem to be susceptible to Achilles tendinitis.

- **Children's feet and shoes**
  A child learning to walk receives important sensory information from the soles of their feet, and shoes can make walking more difficult.

- **Choosing the right shoe**
  The right footwear can help keep your feet healthy, make your physical activity easier and help keep your body safe from injury.
• **Cysts - ganglion cysts**
  A ganglion cyst is the most common lump on the hand, and tends to target women between the ages of 20 and 40 years of age...

• **Diabetes - foot care**
  Good foot care and regular check-ups can help people with diabetes avoid foot problems...

• **Dupuytren's contracture**
  Dupuytren's contracture gradually causes clawing of the fingers as they are pulled towards the palm...

• **Feet - problems and treatments**
  Correctly fitted shoes help you avoid foot and leg pain or injury...

• **Foot care - podiatrists**
  Podiatrists can advise about how to choose the right shoes for your feet...

• **Foot odour - causes and cures**
  Even the most fastidiously clean people can suffer from foot odour...

• **Foot orthoses**
  People who have chronic foot or leg problems that interfere with their health may be prescribed orthoses by their podiatrist...

• **Foot problems - heel pain**
  The heel protects the structures of the foot, but heel pain is a common foot complaint...

• **Footwear for healthy feet**
  Wearing shoes that fit properly and support your feet is vital to avoid sore feet and to prevent or alleviate many common foot problems...

• **Left-handedness**
  If your child is naturally left-handed, don't try to force them to use their right hand...

• **Raynaud's phenomenon**
  Raynaud's phenomenon can be a sign of a more serious underlying condition, so see your doctor if you experience it...

• **Sever's disease**
  Sever's disease is a common cause of heel pain, particularly in the young and physically active...

**Back neck and spine conditions**

• **Back pain**
  Back pain is common. Some people will develop back pain that is persistent (lasts more than three months). There are many things that you can do to live well with back pain...

• **Back pain – disc problems**
  Most disc problems resolve without specific treatment...

• **Back pain in children**
  Children with back pain may grow into adults with chronic bad backs, so it is important to encourage sensible back care...

• **Living with persistent pain**
  Pain is our built-in alarm system. It makes us aware that something might be going wrong in our body. However, there are many things you can do to deal effectively with persistent pain...

• **Neck pain**
  Treatments like physiotherapy, osteopathy or remedial massage can generally help neck and shoulder pain...

• **Scoliosis**
  Scoliosis is an abnormal sideways curve of the spine...

• **Shoulder pain**
  Shoulder pain is common in our community. The good news is that with appropriate treatment pain will improve so you can get back to doing the things you enjoy...

• **Tendonitis**

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Most cases of tendonitis recover completely, but severe untreated tendonitis can lead to rupture of the tendon.

- **Treating persistent pain**
  Pain is our built-in alarm system. It makes us aware that something might be going wrong in our body. However, there are many things you can do to deal effectively with persistent pain.

- **When do I need to see my doctor about persistent pain?**
  Living with persistent pain isn’t easy. Your doctor can help you balance your pain, your treatment and hurdles you encounter in life.

**Related Information**

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- **Bones**
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**Related information on other websites**

- Centre of Physical Activity and Ageing, South Australia.
- Easy Exercise and Screening for You.
- National Centre for Physical Activity and Health UK.
- Victoria Walks.

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