

Overview of the ageing process

What happens as we get older?

It's no secret that our bodies change as we age. Some changes are obvious, while others are more subtle. Many people age comfortably and remain active, alert and vibrant throughout their lives, making their physiologic age younger than their chronological age. Others may experience the effects of osteoporosis and osteoarthritis, which can gradually diminish their abilities to participate fully in activities.



Knowledge bank

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Definition of age

Age can be defined in many ways. Most commonly, we refer to age as a numerical measurement over time which is known as our chronological age, although there are other ways to perceive age. There is our biological age which looks at our physiological capacity, our psychological age which looks at our intellectual function and there is our social age which looks at how we interact with the environment. These definitions of age can be added together to calculate a person's functional age - what is actually occurring at the present time.

Chronological age (numeric measurement) + biological age (physiological capacity) + psychological age (intellectual function) + social age (interplay with the environment) = functional age



When and how does the ageing process start?

Visual ageing starts around the age of 40 - before this we are considered as 'minors'. Our top performance would be around the age of 25, but from then on, we see a decline - a decline that can be affected by ourselves to a certain level. How we eat, sleep and our mental and physical activity all affect the ageing process. Any heredity factors (conditions passed down from previous generations) will start to take effect from the age of 40. The pace and process of ageing varies, making it specific to each individual. Biological ageing is a natural process which occurs in all living things, independent of being a human being, an animal or a plant, with all species having a maximum life expectancy.

How the ageing process affects the human body

- Grey hair
- Non-elastic skin
- Fragile bones
- Height loss and loss of S-shaped spine
- Reduced muscle
- Poor body balance
- Incontinence
- Arteriosclerosis (the thickening and hardening of the walls of the arteries)
- Changes in the senses

All of these factors, apart from grey hair, could affect us physically, resulting in greater dependence on technical aids of various levels, from a bath handle to a wheelchair.

How the body changes

Grey hair

Most of us find our first “greys” by the time we turn 30, usually at the temples, then later, across the scalp. As we get older, the pigment cells in our hair follicles gradually die. When there are fewer pigment cells in a hair follicle, that strand of hair will no longer contain as much melanin and will become a more transparent colour — like grey, silver or white — as it grows.



Non-elastic skin

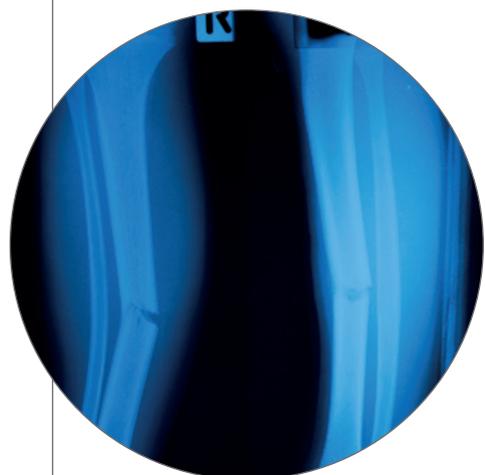
Skin changes are among the most visible signs of ageing through wrinkles and sagging skin. The skin's elasticity is affected by the upper fat layer under the skin becoming reduced. The skin layer (epidermis) protecting the blood vessels also becomes thinner making them more fragile, which leads to easier bruising and bleeding under the skin. As the skin becomes thinner, this leads to risk of pressure ulcers, especially around the buttocks due to sitting for longer periods of time and generally being less active. It is important that care and attention is given to this area as pressure ulcers are quick to form but take longer to heal.



Fragile bones

The skeleton is at its strongest when we are between 20 and 25 years of age and from then on the mineral content of bones decreases by 0.5-1% Per year. As bone formation slows down, it results in a loss of bone tissue which makes them fragile. As bones lose mass, osteoporosis develops, affecting both women and men. In the spine, osteoporosis can lead to crush fractures of the vertebrae, resulting in a “dowager’s hump.”

Osteoporosis is also responsible for the majority of hip fractures in older men and women. Age-related kyphosis often occurs after osteoporosis weakens spinal bones to the point that they crack and compress. Kyphosis is a forward rounding of the back. Some rounding is normal, but the term “kyphosis” usually refers to an exaggerated rounding of the back. It can occur at any age and is most common in older women. The chemistry of cartilage, which provides cushioning between bones, also changes. With less water content, the cartilage becomes more susceptible to stress. As cartilage degenerates, arthritis can develop. Lastly, ligaments, connective tissues between bones, become less elastic as we age, which reduces our flexibility. To help prevent osteoporosis, exercise is vital. The more active a person is the stronger the bones.



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Height loss and loss of s-shapes spine

From around the age of 40, a person's height will decrease by around 5-20 mm every 10 years. This is due to ageing changes in the bones, muscles and joints, which results in the discs in the spine becoming flatter and the vertebrae being pressed together affecting the s-shaped spine. When we are young, the spine has an s-shape, however, as we age our spine becomes straighter and eventually has a slight kyphosis. As the movement between the vertebrae decrease, our entire back and hip region becomes stiffer.

Reduced muscle

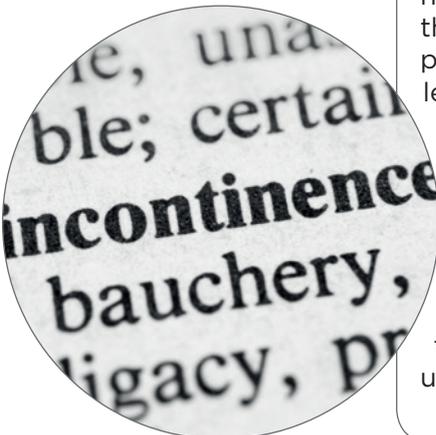
Around the age of 30, muscles start to shrink and lose mass, which results in 30-50% of muscle tissue lost between the ages of 30 and 80. This is a natural process but a sedentary lifestyle can accelerate it. The less muscle tissue a person has, the harder it is for them to move and ultimately leads to an unbalance between extension and flexion muscles. As a result, when we get older, we have a tendency to have more of a "bend" in our bodies, we become fragile and less mobile. Other muscle changes that occur are as follows:

- o The number and size of muscle fibres also decrease, which is why it takes muscles longer to respond in our 50s than they did in our 20s
- o The heart muscle becomes less able to propel large quantities of blood quickly to the body, which is why we tire more quickly and take longer to recover
- o The body's metabolic rate (how quickly the body converts food into energy) slows, which can lead to obesity and an increase in "bad" cholesterol levels



Poor body balance

Ageing causes the body's balance to be less accurate due to changes in the balance centre in the brain. In the neuromuscular junction in the brain, the neurotransmitters act at a slower pace between the synaptic bulb of the nerve and the motor end plate of the muscle, making the body sensor system less efficient. We tend to become slower in our movements and have a tendency of lose our balance.

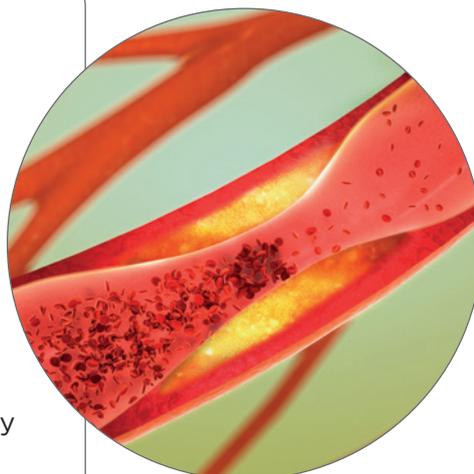


Incontinence

Incontinence is more common in women than men due to the structure difference in the urinary tract and also child birth, causing poor pelvic muscles. As the process of emptying the bladder is a reflex, the weakened pelvic muscles, which usually prevents urination, lets urine pass.

Arteriosclerosis

By the age of 20, arteriosclerosis, the thickening and hardening of the walls of the arteries, begins. On average, the heart beats around 100,000 a day with 6-8 litres of blood being pumped around the body. Ageing causes the level of fat around our connective tissues to increase which, overtime, affects the level of oxygen in the body. The elasticity in the lungs decreases and consequently so does the exchange of carbon dioxide. When sitting for long periods of time, we have a tendency to adapt a slumped position. When in this position, our lungs can't expand fully which can make us tired. This can affect a person at any age, however, as we age, our chest needs to be able to expand fully as the lung capacity will decrease.



Changes in the senses

The way our senses (hearing, vision, taste, smell, touch) give us information about the world changes as we age. Sensory information is converted into nerve signals that are carried to the brain. There, the signals are turned into meaningful sensations. A certain amount of stimulation is required before we become aware of a sensation. This minimum level of sensation is called the threshold. Ageing raises this threshold, resulting in the need for more stimulation to be aware of the sensation. Ageing can affect all of the senses, but usually hearing and vision are most affected. Our senses become impaired, and this can make it harder to notice details. Sensory changes can affect lifestyles and cause problems with communicating, enjoying activities and socialisation. Sensory changes can sometimes lead to isolation.



Overview

The ageing process is largely determined by genetic factors and heavily influenced by environmental factors such as diet, exercise, exposure to micro-organisms, pollutants and ionising radiation. That is why two people of the same age may differ markedly in terms both of physical appearance and physiology. Gender also plays a part. In most developed countries, women typically outlive men by 7-10 years.