

Aging is a normal physiological process that is characterised by morphological and functional changes in the body over a lifetime. In competitions we categorise athletes in different age groups so we obviously accept a negative correlation of performance with age? There are also those paddlers who like to use their age as an excuse for poor physical performance but it is also obvious that elite paddlers are not necessarily the youngest but the ones investing more time and energy into sport and a healthier lifestyle.

The science of aging is extremely complex and mostly explained on a cellular and molecular level but on a few basic facts I will show the consequences of aging at a functional level and if aging has an effect on performance.

Functional capacity of organ systems

In a younger person the capacity of organs to function is 2-10 times higher than necessary for normal daily activities but is essential to adapt easily to extreme life circumstances, physical and mental challenges. From the age of 30 there is a significant decline in such a “reserve” of adaptability. That means with increasing age functional limitations become apparent with physical/mental stressors, but not so much in times of rest. Mimicking healthy physiological stressors on our organ systems through regular exercise, mental/intellectual activity and also a healthy diet can delay functional decline significantly.

Cardio-vascular changes

The resting heart rate is very similar between younger and older people however the maximal heart-rate during intense exercise is reduced in older people. Let's say a person in his/her 20s has a maximal heart rate of 200 beats/minute, the heart-rate of an 85 years old is only 170 beats/minute at its maximum.

Does this explain a reduced performance? **No!**

The decline in maximal heart rate (in which we should not operate in anyway) can be compensated by the increased heart-minute volume. Heart-minute volume is a factors of heart size to pump more volume of blood per minute and is a result of training and not affected by age.

A common finding in older people is arteriosclerosis (arteries narrow and harden, leading to poor circulation of blood throughout the body) which is an accumulative effect of an unhealthy lifestyle and diet rather than age.

Respiratory changes

There are morphological and functional changes in the lung that are explained by the aging process. Most significant here is the loss of elasticity of the lung tissue and the increased rigidity of the thoracic skeletal framework which leads to a reduced vital capacity of the lung. Furthermore the number of lung capillaries (blood vessels responsible for blood gas exchange) are reduced in older people.

Does this affect performance? **Yes!**

Endocrine and musculoskeletal changes

The level of testosterone (in men) and oestrogen (in women) declines between the age of 25 and 90 years. The declining hormone level can negatively affect muscle mass and bone density but both are highly compensated by regular exercise.

The elasticity of tissues, particularly tendons can be reduced in older people which can lead to higher risk of injuries. However, a hundred year old yogi can be more flexible than a 16 year old teenager! It is increasingly important to do regular stretching with increasing age to compensate for the reduced elasticity.

Aging is often referred to as a “lifelong process of dehydrating” on a cellular level, therefore hydration is extremely important for the vitality and mobility of tissue, particularly fascia.

Does this affect performance? **Yes, if you don’t exercise, stretch, eat healthy and drink your water!**

As you can see with just a few examples there are effects of age on physical performance. The natural decline of “functional reserves” with age however can be/should be compensated by the “discipline” of a healthy lifestyle and regular exercise starting from the age of 30!

Paddle on!