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THE INFLUENCE OF YOUR INTERVERTEBRAL DISCS ON YOUR HEIGHT

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Did you ever notice that as people get old, they seem to "grow" shorter? Did you know that if you measure your height at the start of the day and remeasure it before you go to bed you will be about half an inch shorter? What accounts for these observations? Do we actually grow shorter with age or as time passes by during the day? The interesting anatomy of our intervertebral discs provides us some answers.

The intervertebral disc (discus intervertebralis) as the name suggests lies between two vertebrae. There are 23 discs in the vertebral column of an adult: 6 in the neck (cervical region), 12 in the middle back (thoracic region), and 5 in the lower back (lumbar region). They are absent between the Atlas and Axis (1^{st} and 2^{nd} vertebrae respectively) and in the sacral and coccygeal regions of the vertebral column.

An intervertebral disc consists two main parts; a fibrocartilaginous outer ring called the anulus fibrosus (anulus fibrosus also annulus fibrosus) made up of layers of collagenous fibres and a pulpy, jelly-like inner mass called the nucleus pulposus (nucleus pulposus) consisting of gelatinous tissue in which a cavity is sometimes present. The nucleus pulposus has elastic properties and represents the residue of the notochord. Together, all the intervertebral discs make up about 1/5 of the entire length of the vertebral column.

So then how do these discs affect our height? The nucleus pulposus plays a very important role in the functioning of the disc. Water and other various substances such as proteoglycans are contained in the matrix of the nucleus pulposus. These are responsible for its elastic properties. Because of this the nucleus pulposus (supported by the anulus fibrosus) acts as a shock absorber or cushion between the vertebrae during impact so that the vertebrae do not clash violently into each other when we do everyday tasks like jumping and running or do some other demanding task like lifting a weight.

However, because we spend most of the day standing or sitting, there is continuous pressure on the intervertebral discs which causes the jelly-like nucleus pulposus to flatten and so a person ends up being a quarter to half an inch shorter at the end of the day. At night when we go to sleep and lie horizontally on a bed, the nucleus pulposus reinflates with fluid restoring our normal height. This happens every day. However, as we age the discs progressively lose the ability to fully reinflate with fluid due to dehydration (loss of water) and decrease in concentration of proteoglycans in the matrix of the nucleus pulposus. Because of this, people of about 50 years start to become permanently shorter because the discs (ie. the nucleus pulposus) become permanently flattened.

This explains why we become shorter as we grow and why we seem shorter at the end of the day. These account only partially for the phenomenon because factors such as bone injuries and illnesses may also account for this interesting observation.