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**2017 05.02 Health Matters**

**Cellular Aging**

**Joe**

**This is Health Matters, reporting on how cells age and how this impacts the health of elders. And, it turns out, the the health of the not-so-old as well.**

**Kristen**

**In the 1930s, scientists discovered that strands of DNA have caps on them. Every strand of DNA, they found, has a cap on each end. Sort of like a shoelace. In the decades since, researchers have determined that these caps serve a protective function. Since DNA is the genetic information in our cells that makes us who we are, insuring its protection is a basic body mechanism. DNA also determines how all of our body parts function. Another good reason to insure DNA is protected. The name given these protective caps is telomere (tel-uh-meer).**

**Taushona**

**But telomeres, like the plastic tips on the end of on shoelaces, however, wear down over time. And they wear down for a variety of reasons.**

**Joe**

**To begin with, our cells replenish by copying themselves before they die. This happens continually over a lifetime.**

**There is a hitch, however. This natural process of cell reproduction contributes to the shortening of telomeres. The reality is this: telomeres get shorter each time a cell copies itself. The DNA still remains intact. But the protective coating becomes shorter.**

**Kristen**

**Eventually telomeres become too short to do their job. They no longer protect their strand of DNA. And as that happens, the cells age prematurely and stop functioning properly. Basically, telomeres do a disappearing act over the decades. Sooner or later, they aren’t there to serve the DNA’s needs.**

**Taushona**

**Telomere shortening is all part of the plan, so to speak. However, cell reproduction is not the only reason why telomeres become shorter and shorter. These protective caps on the strands of our cellular DNA can be shortened by stress, smoking, obesity, lack of exercise and a poor diet.**

**Joe**

**Which is why recent research on telomeres is so important. It has given us yet another window on the risks facing today’s stressed populations. Researchers have discovered, for example that even young people have evidence of shortened telomeres. It seems that the cells of some children are old before their time. And what this means is quite specific. There is visible evidence that children exposed to violence have shortened telomeres.**

**Kristen**

**Further, the level of telomere deterioration in children is increased when they are exposed to multiple forms of violence. From bullying to physical beating, violence directed toward children creates intense stress. Which in turn contributes to a shortening of telomeres at an early age.**

**Joe**

**There is even evidence that shortened telomeres are related to intergenerational PTSD or post-traumatic stress disorder. PTSD can be transferred genetically, as studies of holocaust survivors have indicated. Since stress is a significant cause of telomere deterioration, genetically inherited stress patterns can contribute to shortened telomere lengths in young people.**

**Taushona**

**Add to that the fact that adults with PTSD are stressful to be around anyway. For all sorts of reasons. Not just violence. But neglect, anxiety, irrational outbursts. Things that worry a child who has to witness such behavior on a daily basis. And worries of this nature worries are deeply stressful.**

**Kristen**

**Which is why telomere length is now understood as a measure of biological age instead of chronological age. And what has been found regarding stress levels of the children of holocaust survivors is also true of Native Americans and other cultures victimized by genocide. Intergenerational PTSD contributes to early aging and the diseases that result.**

**Joe**

**Think about the other reasons why telomeres can shorten before their chronologically expected time. Namely, smoking, obesity, lack of exercise and poor diet. You can see why some cultures are doubly vulnerable. And why poverty and racism, with all the depression and helplessness they can entail, may be contributing factors.**

**Taushona**

**But is there a bright side to the new research on telomeres? I mean, can changing poor eating habits, reversing a sedentary lifestyle and stopping smoking prevent the early shrinkage of those caps on our strands of DNA?**

**Kristen**

**According to some scientists, Yes! While there is no consensus on this, a couple of recent books report in detail on the positive impacts on telomeres when these changes are made.**

**Joe**

**Health Matters is a production of KIDE Hoopa CA.  Produced and written by Cynthia Poten. Engineered by Joseph Orozco.  Our readers were Kristen Marshall, Taushona Moon and Joseph Orozco.  For this audio and more information, visit our download area at  www.kidefm.org. Thank you for listening. Your health adds to the health of our community.**

**Sources and Links**

<https://www.tasciences.com/telomeres-and-cellular-aging/>

<http://updentity.sens.org/awareness/?gclid=CJbsxfbZuNMCFUtNfgodk7wOyA>

<https://www.statnews.com/2017/01/03/aging-control-telomere-effect/>

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<https://www.nicabm.com/old-before-their-time-the-effect-of-ptsd-on-childrens-telomeres/>

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<https://www.sciencedaily.com/releases/2014/04/140413135953.htm>

“The Telomere Effect,”

“Younger: A Breakthrough Program to Reset Your Genes, Reverse Aging, and Turn Back the Clock 10 Years.”

Our cells replenish by copying themselves. This happens constantly throughout our lives. Telomeres get shorter each time a cell copies itself, but the important DNA stays intact.[4](https://www.tasciences.com/what-is-a-telomere/)

Eventually, telomeres get too short to do their job, causing our cells to age and stop functioning properly.[3,4,5](https://www.tasciences.com/what-is-a-telomere/) Therefore, telomeres act as the aging clock in every cell.

*Telomeres are shortened as we age, but telomeres can also be shortened by stress, smoking, obesity, lack of exercise and a poor diet*[*3,4,6,7*](https://www.tasciences.com/what-is-a-telomere/)

**Short telomeres are connected to premature cellular aging.**[3,8](https://www.tasciences.com/what-is-a-telomere/)

Telomere shortening is involved in all aspects of the aging process on a cellular level. Telomere length represents our *biological* age as opposed to our *chronological* age.

Many scientific studies have shown a strong connection between short telomeres and cellular aging.[8](https://www.tasciences.com/what-is-a-telomere/)