

# For Active Dogs!

Brought to you by Canine Sports Productions

Coaching dog enthusiasts to embrace the unique needs of active dogs through teaching, mentoring and educational media

VOLUME 1 | ISSUE 10 | September 2018

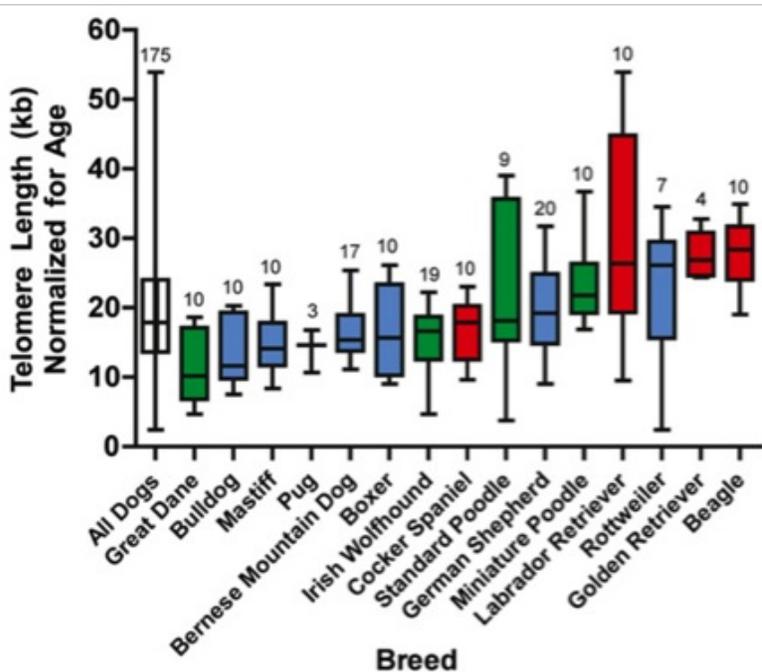
## How to Increase Your Dog's Lifespan!

Greetings!

A collaborative study by researchers in Canada and the US showed that **dogs with longer telomeres live longer** (1). What are telomeres, you ask? Well, telomeres are caps at the end of each strand of DNA that protect your dog's chromosomes, like aglets, the plastic tips at the end of shoelaces. Without aglets, shoelaces become frayed so they can no longer do their job. Likewise, without telomeres, DNA strands become damaged and your dog's cells can't do their job.

Cells have to divide for our dogs to be healthy. The problem is, **every time a cell divides, a piece of the telomere is cut off**. That is why cells eventually die after replicating many times. **Anything that causes a cell to divide more often will increase the rate of aging of that cell**. And of course, when cells age, so does the dog that is made up of those cells.

The researchers measured the length of telomeres in peripheral blood cells from 175 different dogs of 15 different breeds (**Figure 1**). They then graphed the telomere lengths against mortality data from a meta-analysis of 74,556 dogs (2). They found that **telomere length was a strong predictor of average life span**. This finding had a p value of  $< 0.0001$  which means that there is a 99.99% chance that the results were not just due to chance.



### Upcoming Events:

#### For Dog Lovers/Trainers

Sept. 29 - Oct. 2, 2018

[Coaching the Canine Athlete Seminar](#)

Guides Canins Inc  
St. Lazare (Québec), Canada  
[chelsea@guidescanins.com](mailto:chelsea@guidescanins.com)

Nov. 17 - 18, 2018

[Canine Sports Medicine and Rehabilitation Conference For Dog Trainers](#)

Frederick, MD  
[info@caninesports.com](mailto:info@caninesports.com)

Jan 31, 2019

[NACSW & CNCA Joint Conference](#)

DoubleTree Golf Resort Palm Springs  
Cathedral City, CA  
[www.cnca.com](http://www.cnca.com)

Feb. 9 - 10, 2019

[Coaching the Canine Athlete Seminar](#)

Coventry School for Dogs and Their People  
Columbia, MD  
[lizcatalano@thecoventryschool.com](mailto:lizcatalano@thecoventryschool.com)

#### For Veterinarians, Physical Therapists and Veterinary Technicians/Nurses

Oct. 12 - 13, 2018

[Massachusetts Veterinary Medical Association Canine Sports Medicine](#)

(9 hours CE)  
Seacrest Beach Hotel  
East Falmouth, MA (Cape Cod)

[www.massvet.org](http://www.massvet.org)

**Figure 1.** Telomere lengths of 15 breeds with three or more samples. Dogs are categorized into working (blue), herding (green), and hunting (red) breeds. The line in the middle of each colored bar represents the median number of telomeres for that breed. The horizontal lines at the top and the bottom of each vertical line represent the maximum and minimum number of telomeres for that breed. The length of the colored bar represents the telomere lengths for the middle 50% of dogs.

Interestingly, the study also showed that **dogs lose telomere DNA 10 times faster than humans do**, which is consistent with the fact that dogs live about 1/10th as long as people do. They also determined that **male dogs lose telomere length slightly faster than females**, which is also true in humans. Note, however, that this study showed correlation, not causation. The correlation could be due to other factors, such as breed size, which also has been correlated with breed life span.

In fact, **the correlation between breed size and life span could be related to telomere length**. If you think about it, an Irish Wolfhound, which weighs 22.8 oz at birth and about 160 lb as an adult, multiplies its weight approximately 112 times to reach adult size (3). That means that those cells are undergoing many rounds of cell division, cutting off pieces of the telomeres each time. In contrast, a Yorkshire Terrier weighs on average 4.25 oz at birth and 7 lb as an adult, which means that it multiplies its birthweight by only 26 times to reach adulthood. Theoretically, **the smaller dog would therefore retain its telomere length longer, and thus live longer**.

---

## For Active Dogs! Trivia

Answers to all trivia questions are found in past  
For Active Dogs! newsletters

### What is the reason to add antioxidants to your dogs diet?

click [here](#) to find out the answer

---

Further, the study demonstrated that **breeds with shorter mean telomere lengths have an increased probability of death from cardiovascular, respiratory, gastrointestinal and muscle disease**. This makes sense, because those tissues have a very high rate of cell division. In contrast, breeds with short average telomere length were not more likely to die of neurological conditions, which also makes sense because neurological tissue doesn't replicate very quickly at all.

Now, countering the fact that telomeres get shorter and shorter over time is the fact that **the body produces an enzyme called telomerase, which can lengthen telomeres**, reversing the effect of natural aging on the DNA strands. **Telomerase activity is very high in cancer cells**, providing one mechanism by which these cells replicate continuously and do not become senescent. That is consistent with the fact that in this study, telomere length did not correlate with the rates of cancer in the various breeds.

The good news for dog owners is that **we may be able to lengthen our dog's telomeres through the care we give**. Regular **physical activity**, a diet rich in **fresh food** and **antioxidants**, and **low stress** have all been shown to increase telomere length in multiple species (4, 5, 6, 7, 8).

There is one last point about telomeres that my friend, Dr. Gayle Watkins from [Avidog International](#) has been talking about for years. Telomere length increases with age in sperm, and **offspring conceived by older fathers have longer telomeres than those conceived by younger fathers**. If this relationship holds true in dogs, as suggested by their similar telomere biology, it might be **possible to significantly increase the average healthy life span of our dogs**

Nov. 9 - 11, 2018

[Canine Sports Medicine  
Module](#)

Canine Rehabilitation Institute  
Coral Springs, FL  
[www.caninerehabinstitute.com](http://www.caninerehabinstitute.com)

Feb. 23 - 25, 2019

[Canine Sports Medicine  
Module](#)

Canine Rehabilitation Institute  
Coral Springs, FL  
[www.caninerehabinstitute.com](http://www.caninerehabinstitute.com)

Mar. 11 - 13, 2019

[Canine Sports Medicine  
Module](#)

Canine Rehabilitation Institute  
Brisbane, QLD, Australia  
[www.caninerehabinstitute.com](http://www.caninerehabinstitute.com)

Mar. 22 - 24, 2019 **NEW!**

[Canine Sports Medicine  
Module](#)

Canine Rehabilitation Institute  
Coral Springs, FL  
[www.caninerehabinstitute.com](http://www.caninerehabinstitute.com)

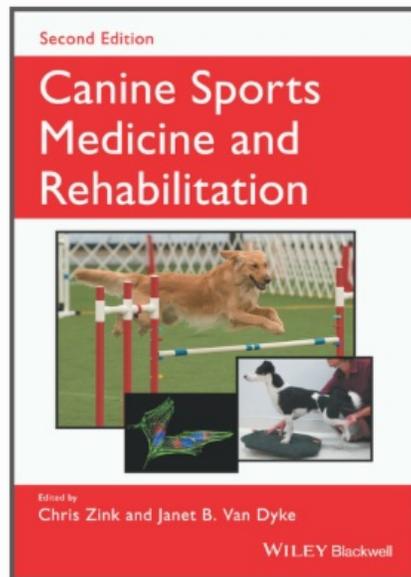
by using sperm from older males, over just a few generations. Some breeders are already doing that to increase the longevity of the dogs they produce, which is pretty cool!

**References** (Full articles available [here](#)):

1. Fick LJ, Fick GH, Li Z, Cao E, Bao Bo, Heffelfinger D, Parker HG, Ostrander EA, and Riabowo K. Telomere length correlates with life span of dog breeds. *Cell Reports* 2012;2:1530–1536.
2. Fleming JM, Creevy KE, and Promislow DE. (2011). Mortality in North American dogs from 1984 to 2004: an investigation into age-, size-, and breed-related causes of death. *J. Vet. Intern. Med.* 2011;25:187–198
3. Groppetti D, Pecile A, Palestini C, Marelli SP and Boracchi P. A national census of birth weight in purebred dogs in Italy. *Animals* 2017;7:43.
4. Arsenis NC, You T, Ogawa EF, Tinsley GM, Zuo L. Physical activity and telomere length: Impact of aging and potential mechanisms of action. *Oncotarget.* 2017;8(27):45008–45019. doi:10.18632/oncotarget.16726.
5. Tucker LA. Physical activity and telomere length in US men and women: An NHANES investigation. *Preventive Medicine* 2017;100:145-151
6. Xu Q, Parks CG, DeRoo LA, Cawthon RM, Dale P Sandler DP, and Chen H. Multivitamin use and telomere length in women. *Am J Clin Nutr* 2009;89:1857–63.
7. Garcia-Calzon S, Moleres A, Martinez-Gonzales MA, Martinez JA, Zalba G, Marti A, GENOI Members. Dietary total antioxidant capacity is associated with leukocyte telomere length in a children and adolescent population. *Clinical Nutrition* 2017;34:694e699
8. Epel ES, Blackburn EH, Lin J, Dhabhar FS, Adler NE, Morrow JD and Cawthon RM. Accelerated telomere shortening in response to life stress. *PNAS* 2004;101: 17312–17315

## Want to Know More?

**Special Offer!** **Canine Sports Medicine and Rehabilitation (2nd Edition)**  
by *Chris Zink and Janet B. Van Dyke*



## SPECIAL OFFER

Thoroughly revised new edition

20% more information

Three new chapters cover:

Biological Therapies

Working Dogs

The Business of Rehabilitation

Hard cover for durability

**Get your autographed copy!**

Visit our website

Connect with us

