Helping Your Pet Age Gracefully

Mark J Hanks DVM
Kindred Spirits Veterinary Clinic

www.kindredvet.com
Importance of pets in our lives
The goal

• Find the science behind the products and evaluate best options for keeping pets healthy as they age

• It's about Quality of Life

• No product sales—we will discuss only concepts
Human/Animal Age Comparison

<table>
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<tr>
<th>Pet Age</th>
<th>Feline</th>
<th>0-20</th>
<th>21-50</th>
<th>51-120</th>
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<th>Human Equivalent Age</th>
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</table>
Effect of Aging

- Decline in
  - Neurological function
  - Physical function (kidney, liver, muscle mass, all organs generally lose mass with age, with the exception of the left ventricle of the heart)

Although much of the rate of aging is genetically determined, the process is affected greatly by lifestyle.
Theories of Aging

Programmed Longevity—there are certain systems in the body that are programmed to work a certain number of times. However, external stresses can increase or decrease that time. For instance, decreasing calories can increase lifespan.

Mitochondrial aging—free radicals produced in the body as a result of living cause damage to the cells in the body. Systems to break down those free radicals decrease with age.

Pleiotropy—Early maturity and stress causing increased resources to go to reproduction rather than repair in youth can compromise longevity.
What can YOU do??

- Exercise/
- Optimal Weight
Purina Lifespan Study

- 48 labs divided into two groups
- First group fed free choice for the first three years, then the calculated amount for their size.
- Second group fed same food, 75% as much.

JAVMA Vol 220 No 9 May 1, 2002 pp 1315-1320
Median life span increased by 15%

- JAVMA Vol 220 No 9 May 1, 2002 pp 1315-1320
Age at which 50% of dogs needed treatment for medical problems

- JAVMA Vol 220 No 9 May 1, 2002 pp 1315-1320
Purina Lifespan Study

- Followed for 14 years
- On average, the lean-fed dogs weighed less, had a lower percentage of body fat and experienced a two-year delay in the loss of lean body mass as they aged, compared to the control group.
Purina Lifespan Study

- The bad news
- In a follow up study, 28% of owners characterized their pets as above ideal body condition
- 79% of experts scored the same pets as above ideal body condition
Review for the test

Where is your pet??
Feline Weight Loss

- Cats are harder to enforce an exercise program
- “Catkins” (know kidney function)
- Free choice vs meal feeding
- Resting Energy Requirement (RER)
  
  \[(30 \times \text{kg optimal body weight} + 70)\]

  Multiply by 0.8-1.0
Canine Weight Loss

- Exercise is key—it increases lean body mass and burns calories
- High fiber, low calories
- Add fresh vegetables as tolerated
- $\text{RER}= 1-1.2 \ (30 \times \text{kg optimal body weight} + 70)$
- Drugs
Questions???
Canine Cognitive Dysfunction

Because the signs of old age aren't always old age.

- Tail doesn't wag like it used to
- Gets confused
- Messes in the house
- Turns away when being petted
- Barks at night for no reason
- Doesn't recognize you
- Doesn't run to greet the kids

Repetitive Behaviors—pacing, circling, pawing
CCD vs Alzheimer's
Canine Cognitive Dysfunction

- Slowly progressive
- Symptoms usually overlooked at first
- As disease progresses, support required by owners becomes huge
What happens?

Cummings et. Al. Neurobiology of Learning and Memory 1996. Amyloid accumulation correlates with cognitive dysfunction in dogs.
Is there a link between oxidation and amyloid deposition?

• “Oxidative stress increases amyloid (beta) production and conversely amyloid deposition increases oxidative injury”

What are antioxidants?

- An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. Oxidation is a chemical reaction that transfers electrons from a substance to an oxidizing agent. Oxidation reactions can produce free radicals, which start chain reactions that damage cells.

- Wikipedia

University of Toronto, Division of Life Sciences, Scarborough, Ont., Canada M1C 1A4. milgram@psych.utoronto.ca


Landmark discrimination learning in the dog: effects of age, an antioxidant fortified food, and cognitive strategy. Norton W Milgram, E Head, B Muggenburg, D Holowachuk, H Murphey, J Estrada, C J Ikeda-Douglas, S C Zicker, C W Cotman

Life Science Division, University of Toronto at Scarborough, 1265 Military Trail, Scarborough, Ont., Canada M1C 1A4. milgram@psych.utoronto.ca


Oxidative damage increases with age in a canine model of human brain aging. E Head, J Liu, T M Hagen, B A Muggenburg, N W Milgram, B N Ames, C W Cotman

Institute for Brain Aging and Dementia, University of California, Irvine, California 92697-4540, USA. ehead@uci.edu


Visual-discrimination learning ability and beta-amyloid accumulation in the dog. E Head, H Callahan, B A Muggenburg, C W Cotman, N W Milgram

Institute for Brain Aging and Dementia, University of California, Irvine,
Older dogs make more mistakes in problem solving
Dogs given antioxidant fortified food when older performed much better than dogs that were not given antioxidant fortified food.
Dogs given Behavioral enrichment performed better than dogs that were older with no behavioral enrichment
What is Behavioral Enrichment?

- **Environmental**: enhancing the animals' captive habitat with opportunities that change or add complexity to the environment.
- **Feeding**: making feeding more challenging. Different methods of food presentation encourage animals to investigate, manipulate and work for their food as they would in non-captive environments.
- **Manipulation**: providing items that can be manipulated by the paws, feet, tail, horns, head, mouth, etc. This promotes investigatory behaviour and exploratory play.
- **Puzzles**: requiring an animal to solve simple problems to access food or other rewards.
- **Sensory**: stimulating animals' senses: visual, olfactory, auditory, tactile, and taste.
- **Social**: providing the opportunity to interact with other animals, either conspecifics or interspecifics.
- **Training**: training animals with positive reinforcement or habituation.
Treatment

- Medication
- Antioxidants
- Containment
- Euthanasia
Antioxidants

- Vitamin A and carotenoids
- Vitamin C
- Vitamin E
- Selenium
- CoEnzyme Q10
- Glutathione
- Phytochemicals (Lycopene, Lutein, flavonoids)
- Others
Best way to get them
Highest antioxidant levels

**Fruits:**
- Prunes -- 5570
- Blueberries -- 2400
- Blackberries -- 2036
- Strawberries -- 1540
- Raspberries -- 1220
- Plums -- 949
- Oranges -- 750
- Cherries -- 670
- Kiwi fruit -- 602
- Grapefruit, pink -- 483

**Vegetables:**
- Kale -- 11770
- Spinach -- 11260
- Brussels sprout -- 1980
- Alfalfa sprouts -- 1930
- Broccoli Flowers -- 1890
- Beets -- 1840
- Red bell pepper -- 1710
- Corn -- 1400
- Eggplant -- 1390

Oxygen Radical Absorbance Capacity, Tufts Study
Other ways to get them

- Diets (whole food)
- Supplements
Questions??
Essential Fatty Acids

- AA and EPA act as precursors for the synthesis of eicosanoids, a significant group of immunoregulatory molecules that function as local hormones and mediators of inflammation. The amounts and types of eicosanoids synthesized are determined by the availability of the PUFA precursor and by the activities of the enzyme system to synthesize them. In most conditions the principal precursor for these compounds is AA, although EPA competes with AA for the same enzyme systems. The eicosanoids produced from AA appear to be more inflammatory than those formed from EPA. Ingestion of oils containing omega-3 PUFA results in a decrease in membrane AA levels since omega-3 PUFA replace AA in the substrate pool and also produces an accompanying decrease in the capacity to synthesize eicosanoids from AA. In contrast, eicosanoids derived from EPA promote less inflammatory activity and may alter vascular function. Inflammatory eicosanoids produced from AA may be depressed when animals consume foods with high levels of omega-3 fatty acids.
English, Please

You know those things you keep seeing in magazines, the newspaper, dog/cat food labels?

- Omega-3, Omega-6
- Fish oil
- Flaxseed, borage oil
- Real salmon
Turns out they are important

- Animals, unlike plants can only make fatty acids up to a certain point.
- Animals make eicosanoids which mediate inflammation among other things.
- Fish eat algae that have a lot of omega-3 fatty acids like EPA and DHA.
- Eicosanoids made from EPA cause less inflammation than those made from other fatty acids like AA (Arachadonic Acid).
Omega-3 to Omega-6 ratio

• Much discussion has taken place about the optimal Omega-6:Omega-3.
• 5:1 to 10:1
• Vegetable oils have lots of omega-6
• Most foods have more than enough omega-6 fatty acids.
• Increase omega-3 to 50-250mg/kg
Sources of Omega-3

- Fish oil—great DHA/EPA quantity
- Other alternatives
  - Soybean oil
  - Flaxseed oil
  - Canola oil
  - Walnut oil
Benefits

- Skin—inflammation that is a result of allergies can be modified by adding omega-3 fatty acids

- Safe to say that 50-65% of dogs with allergic dermatitis and otitis externa will be improved with fatty acid supplementation
Benefits

• Arthritis

In a series of studies with omega-3 fatty acid supplementation (39X normal) significant improvement in all parameters was seen. The effect is most potent and maybe only with EPA.
Benefits

- **Chronic kidney disease**—common in cats and dogs

Increase in omega-3 in 1 study resulted in:
- Lower mortality
- Better renal function
- Less proteinuria
- Fewer Renal lesions
Benefits

- Heart failure

Relatively small study of 28 dogs in heart failure fish oil supplement vs placebo

- Decreased interleukin-1 beta
- Improved cachexia
- Decreased insulin like growth factor
Benefits

- Cancer?
Take home message

- Weight management——YES
- Behavioral Enrichment—YES
- Antioxidants---YES
- Fatty acids—YES
- Love—definitely
Thank you!!!!

Mark Hanks DVM
Kindredvet@aol.com