

HOT TOPIC

Biological Age and Biological Clocks



In focus

Age is not a disease, but it is a risk factor for disease and pets' aging trajectories will vary by individual. Biological age, measured by biological clocks, can indicate whether a pet is aging in a healthy, or unhealthy, manner.

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What is biological age?

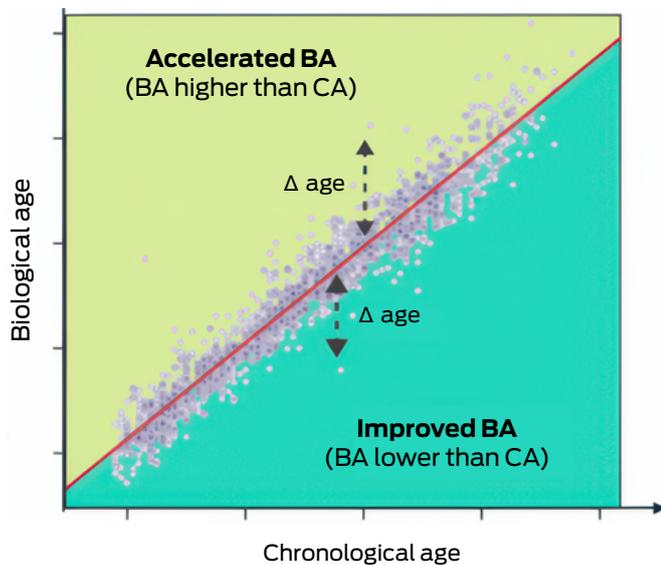
While chronological (calendar) age (CA) reflects the amount of time an individual has lived since birth, biological age (BA) indicates **how well** an individual is aging. Aging is a complex process, and the amount of time that has passed since birth may not be the key factor for aging in a pet.¹ For example, a large breed dog and a small breed dog born on the same day will age differently throughout their lives. Similarly, a dog or cat that develops a chronic disease may age at a different rate than their healthy littermates.

When does biological aging begin?

Aging does not start in "senior" pets: the aging process is a continuum and organ and tissue function and health start to decline even before midlife, emphasizing the importance of early preventive care as well as early management of later-life health events to maximize pet health.

How is biological age measured?

BA is measured by biomarker-based complex algorithms called biological clocks.^{2,3} Some clocks are based on age-associated changes to DNA, while others may be based on blood analysis results or organ-specific biomarkers.²



When BA is higher than CA, it indicates accelerated aging and the mismatch between BA and CA may reflect increased disease susceptibility as well as reduced healthspan and lifespan.^{2,3} When BA is lower than CA, it indicates the favorable condition of aging more slowly than one's years.^{2,3}

What factors affect biological age?

Factors known to impact BA in humans and likely to influence BA in pets include body weight, exercise, stress, nutrition, and disease conditions.⁴ One factor known to accelerate aging (increasing BA) is excess weight; the Purina lifespan study discovered that feeding dogs to maintain an ideal body condition throughout life increased the dogs' lifespan as well as their healthspan⁵ (the period of their life with good health, quality of life, and freedom from disease) and reduced their biological age compared to overweight control dogs.³

How can biological age improve veterinary care and pet health?

As biological clocks for pets improve and become more accessible, biological age can provide a measurable indicator of the quality of a pet's aging process and allow earlier intervention to preserve health and longevity.

Targeted nutrition, lifestyle, and medical interventions may help improve a pet's aging process, lowering their biological age, to give them a healthier *and* longer life.

References

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