

SPECIAL

Feature

AAHA Senior Care Guidelines for Dogs and Cats

This paper provides a working framework for enhancing the well-being of senior pet dogs and cats. Approaches to screening the medical status of senior pets are described in detail, with particular emphasis on establishing baseline data in healthy animals, the testing of clinically ill animals, and assessing senior pets prior to anesthesia and surgery. The management of pain and distress and the application of hospice and palliative care are addressed. Advice on ways to approach euthanasia and dealing with end-of-life issues is also provided. **J Am Anim Hosp Assoc 2005;41:81-91.**

Senior Care Guidelines Task Force:

Mark Epstein, DVM,
Diplomate ABVP (Canine/Feline),
Chair

Ned F. Kuehn, DVM, MS,
Diplomate ACVIM

Gary Landsberg, DVM,
Diplomate ACVB

B. Duncan X. Lascelles, BSc, BVSc,
PhD, MRCVS,
Diplomate ECVS, Diplomate ACVS

Steven L. Marks, BVSc, MS,
MRCVS, Diplomate ACVIM

Jean M. Schaedler, DVM,
Diplomate ABVP (Canine/Feline)

Helen Tuzio, DVM,
Diplomate ABVP (Feline)

Introduction

The purpose of this document is to provide a working framework for veterinarians dedicated to enhancing the well-being of senior pet dogs and cats. Only about 14% of senior animals undergo regular health screening as recommended by their veterinarians.¹ The main obstacle to compliance is the lack of a clear recommendation by the veterinary care team.¹ Unless otherwise specified, all recommendations in this document apply to both the dog and the cat. Providing optimal care for senior pets:

- Acknowledges and enhances the human-animal bond
- Promotes early detection of abnormalities
- Promotes optimal and individualized medical care that may enhance quality of life and promote longevity

The specific goals of this document are to help the veterinarian:

- Promote early detection of disease in the apparently healthy pet
- Prevent or delay morbidity and mortality whenever possible
- Outline/define common clinical conditions in senior pets
- Define aspects of screening, diagnosis, treatment, anesthesia, and surgery that are pertinent to the senior pet
- Outline principles of assessing and managing pain
- Provide a framework to evaluate quality of life
- Assist clients with decision-making at the end of life

In the spring of 2004, AAHA gathered together seven respected, experienced veterinarians with a variety of interests, backgrounds, and specialties. Their goal was to create for veterinary practitioners a useful document about Senior Care.

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What is “Senior”?

The term “senior” has been chosen to describe the aging and older pet. The number of years considered to be “senior” may vary, and one must keep in mind that organ systems, species, and breeds of dogs age at different rates. Several papers have suggested specific ages at which pets should be considered “old,” depending on breed and size, although few recommendations are evidence-based.²⁻¹² Some studies of brain aging in beagles have shown that memory and learning deficits may be found as early as 6 to 7 years of age, with brain pathology found at ≥ 12 years of age.⁸⁻¹¹ Many books and articles consider cats to be senior at 7 to 11 years of age.²⁻⁵

In humans, 56 to 60 years of age is considered to be the start of the senior years. Middle age begins at 42 to 45 and is the time when senior wellness screening generally starts. Middle age would equate to approximately 7 to 8 years of age for most dogs and cats (except for large-breed dogs that may reach middle age a year or two earlier). As the pet enters its senior years, more frequent testing and more extensive examinations are recommended than for younger pets. Rather than attempt to calculate age equivalents to humans, for practical purposes, this task force suggests that practitioners apply these guidelines to dogs and cats that are in the last 25% of the predicted life span for their species and breed.

Approach to the Apparently Healthy Senior Pet

The purposes of clinical screening of healthy pets are to establish a baseline assessment for future comparison and to detect subclinical abnormalities at a time when preventive and therapeutic intervention may have the most benefit. To illuminate such conditions, there is no substitute for a thorough and complete history and physical examination. A wealth of scientific literature documents the presence of subclinical disease in some healthy-appearing animals; to illuminate such conditions, there is no substitute for a thorough and complete history and physical examination. In addition, subtle changes in laboratory test results may give an indication of the presence of underlying disease.

Elements of a Thorough History

Construct questions that extend beyond the client’s presenting concern and that include physical and behavioral signs.¹³ Use of both closed (yes/no) and open-ended questions helps to elicit all possible information about quality of life, physical health, specific behavioral changes, and medications (e.g., prescription, over-the-counter, dietary supplements). When possible, to better ensure an accurate and thorough baseline for future comparison, have the client record historical information on a printed form prior to the appointment.

Elements of a Complete Examination

Observe the pet prior to handling, in an open carrier and/or on the floor. Perform a complete physical examination with special attention to the areas of increasing concern in the senior pet. Such areas may include, but are not limited to:

- Risk factor analysis: signalment, breed, lifestyle/use^{14,15}
- Physical condition: weight gain or loss (that may not have been observed by the client); obesity; changes in body condition or conformation
- Evaluation of skin, coat, claw, and nail bed character; detection and assessment of lumps and bumps
- Presence of lymph node enlargement
- Presence of thyroid nodule (cats)
- Hydration status
- Abdominal palpation, especially the size and shape of kidneys and liver
- Vital signs: temperature, pulse, respirations, and pain assessment¹⁶
- Cardiopulmonary evaluation: auscultation of heart sounds; heart rate and rhythm; pulse rate and quality
- Evaluation of the central nervous system: mentation; cranial and peripheral nerve reflexes, especially conscious proprioception; vision and hearing
- Orthopedic examination: mobility, gait, range of motion, weakness, pain, crepitation, muscle mass
- Rectal palpation (dog)

Elements of a Minimum Laboratory Database

Tests to be included in the minimum laboratory database for the healthy-appearing senior animals are listed in Table 1. Additional testing is based on breed, age, sex, previous medical history, and ongoing medications.^{17,18}

Preventive Care

Preventive care is directed at making recommendations prior to the onset of disease in order to prevent or temper the effects of disease or adverse health conditions. This task force recommends that “senior” wellness tests begin for pets at middle age, to establish baseline values and to insure that there are no clinically silent health abnormalities. During middle age, retesting is recommended at least once a year (equivalent of 4 to 5 human years). Routine health care visits, including a minimum laboratory database, are recommended for senior animals (i.e., those in the last 25% of their predicted life span) every 6 months (equivalent of every 2 to 3 human years).

Focused Areas of Client Education

Such areas include, but are not limited to:

- Increased veterinary attention to dental/oral care and to home dental prophylaxis
- Diet and nutrition
 - Digestibility, caloric content, quality of ingredients
 - Discussion of any new developments in the use of stage-of-life diets, food supplements, or food additives (e.g., omega-3 fatty acids, nutraceuticals)
 - Attention to ingredients that might affect disease in older pets
- Weight control: monitoring of weight gain (especially in the dog) or loss (especially in the cat)
- Parasite control: following published guidelines for fecal examination and parasite prevention^{19,20}

Table 1

Minimum Laboratory Database for Healthy-Appearing Senior Pets

Baseline Tests	Possible Additional Tests*	
Complete blood count	Laboratory Tests	Other Assessments
Urinalysis (UA), including sediment examination	Microalbuminuria [†]	Schirmer tear test
Culture and sensitivity testing, if indicated by UA	Cholesterol, triglycerides	Tonometry
Fecal analysis (ideally by centrifugation)	Serum electrolytes	Arterial blood pressure
Blood urea nitrogen	FeLV/ FIV [‡]	Radiography
Creatinine	Urine protein:creatinine ratio	Ultrasonography, echocardiography
Alanine aminotransferase	Heartworm as regionally and seasonally indicated	Electrocardiography
Alkaline phosphatase		
Glucose		
Total calcium		
Total protein		
Albumin		
Bilirubin		
Total thyroxine (T4) – cat		
Potassium – cat		

* Might be indicated based on initial history, examination, and laboratory results; testing is not limited to these.

[†] Requires a test that detects albumin concentrations lower than those detected by urinalysis test strips

[‡] FeLV=feline leukemia virus; FIV=feline immunodeficiency virus

- Maintaining mobility via exercise or therapeutic intervention
- Vaccination only as appropriate for lifestyle, management factors, geographic region, and local jurisdiction²¹⁻²³
- Mental health: importance of routine and predictable environment; environmental enrichment; companion pets and social interaction; discussion of brain aging; monitoring signs of cognitive decline
- Environmental considerations: housing; indoor/outdoor lifestyle; accommodation of disabilities; avoidance of smoke and toxin exposure
- Potential reproductive disease in nonneutered pets: pyometra, mammary or testicular neoplasia, prostatic disease²⁴

Approach to the Sick or Unhealthy Senior Pet

Common Clinical Conditions

Although senior dogs and cats are affected by many of the same conditions as younger animals, some disorders are of particular significance in the senior pet. These disorders include, but are not limited to, those listed in Table 2.²⁵⁻³⁹

Malignant neoplasia is a frequent finding in senior pets, and this is often a life-limiting ailment. Lists of the most

common neoplastic conditions are found in a variety of texts and articles.^{40,41} It is important to note that a number of cancers are easily misdiagnosed or overlooked early in their disease process. Special consideration should be given to the following common, but often elusive and illusory, neoplastic conditions:

- Squamous cell carcinoma: appearing as nail bed disease (dog) or facial dermatosis (cat)
- Squamous cell carcinoma, melanoma, and fibrosarcoma of the oral cavity: emanating from the gingiva, tongue, or tonsil
- Osteosarcoma causing lameness
- Fibrosarcoma, mastocytoma, hemangiopericytoma: presenting as soft-tissue cutaneous or subcutaneous masses
- Mammary adenocarcinoma: appearing as a swelling or cyst along the mammary chain
- Lymphosarcoma: producing alimentary signs, soft-tissue masses, and organomegaly (e.g., hepatomegaly in the dog, renomegaly in the cat), and at other extra-nodal sites
- Bladder or urethral carcinoma: presenting as dysuria or hematuria

Table 2
 Conditions Particularly Important in Senior Pets Listed by Body System

Conditions	References and Comments
Weight changes	
Weight loss—especially cats*	
Weight gain or obesity	Reference No. 26
Orthopedic disorders	
Osteoarthritis*	Reference No. 30
Gastrointestinal disorders	
Inflammatory bowel disease	
Constipation—cats	
Dental disease*	Reference No. 32
Hepatobiliary disease	
Endocrine disorders	
Hyperthyroidism—cats*	Reference No. 34
Hypothyroidism—dogs	Reference No. 35: Over-diagnosis is common.
Hyperadrenocorticism	Reference No. 39. Reference No. 39: Although hyperadrenocorticism occurs in the older dog, it is often over-diagnosed. Consider signalment (e.g., age, breed predisposition), all clinical signs, baseline laboratory changes, cortisol test results, and possible diagnostic imaging before reaching a diagnosis.
Diabetes mellitus	
Neurological, behavioral disorders	
Behavioral changes*	Behavioral changes may be the first sign of many medical, degenerative, or painful conditions. Watch for disorientation, interactions/relationships with people, sleep-wake cycle alterations, house soiling, anxiety, reduced self-hygiene, decreased responsiveness, and aimless or repetitive activity.
Cognitive dysfunction	Degenerative neurological behavior changes such as night waking, disorientation, house soiling, altered social interactions, decreased attention to stimuli, and increasing anxiety.
Incontinence—fecal, urinary	
Spinal cord disease	
Seizures	
Peripheral neuropathies	
Sensory system disorders	
Ocular: keratoconjunctivitis sicca,* cataracts, retinal disease	Reference No. 31
Otic: deafness	
Urogenital disorders	
Renal disease/failure*	Reference No. 33
Urinary tract infection*	Reference No. 35
Urolithiasis—especially calcium oxalate	Reference Nos. 36, 37
Uterine disease	
Prostatic disease	

(Continued on next page)

Table 2 (cont'd)

Conditions Particularly Important in Senior Pets Listed by Body System

Conditions	References and Comments
Cardiovascular disorders	
Valvular disease—dogs,* cats	Reference No. 25
Myocardial disease—cats,* dogs	Reference Nos. 27, 28
Pericardial disease	
Hypertension*	Reference No. 29
Hematopoietic disorders	
Cytopenias	
Anemias	
Dermatological disorders	
Skin and subcutaneous masses and tumors*	
Chronic otitis externa	
Respiratory disorders	
Chronic rhinitis	
Chronic bronchitis*	Reference No. 38
Laryngeal paralysis	
Tracheal collapse	

* Most important changes

Evaluation of the Sick Senior Animal

First read and follow the healthy-animal assessment guidelines, above. Obtain a comprehensive history, observe the animal, and perform a complete and thorough physical examination, as described for the healthy senior pet. Pay particular attention to any clinical changes or signs of pain.

- Include in the minimum laboratory database all tests for evaluation of the healthy senior, with the addition of serum electrolytes, phosphorus, bicarbonate, total carbon dioxide, and arterial blood pressure.
- Tests for feline leukemia virus and feline immunodeficiency virus should be performed in potentially exposed cats.
- Possible additional tests are listed in Table 3.

Client Communication and Education

Clients overwhelmingly prefer to be told about all the best options, even those options the veterinarian may think the client will decline.⁴² The veterinarian has a responsibility to *recommend* what is best for the pet, but the *chosen* treatment must be what is best for both the patient and the client.

- In recommending a treatment for a pet, thoroughly and impartially evaluate and communicate the consequences of the choices for the pet and client. Involve and empow-

er clients in the decision-making process, making clear their role and responsibilities.

- Design treatment protocols that optimize compliance. Ensure clients are capable of administering the treatment plan mentally, physically, and emotionally, as well as by the route and timing prescribed. If the requirements cannot be accomplished, consider alternative delivery systems, routes, and intervals that have been documented to be effective.
- Senior pets receiving treatment have an increased need for more frequent examinations and testing (new and follow-up). Care of senior pets also necessitates more frequent communication with the client and documentation of progression or regression of signs. Educate clients about the pet's disease state, diagnosis, prognosis, and treatment side effects. Discuss the time commitment and any quality-of-life issues. Educate and communicate with clients both verbally and in writing to better gain a clear understanding of their expectations and revise any expectations that are not realistic.
- Thoroughly document differential diagnoses and assessments in a problem-oriented format. Whenever possible, record a diagnosis and the animal's short-term, intermediate, and long-term prognoses, even if such assessments are temporarily presumptive or tentative.

Table 3
Evaluation of the Senior Sick Pet

Baseline Tests

Complete blood count
Urinalysis (UA), including sediment examination
Culture and sensitivity testing, if indicated by UA
Fecal analysis (ideally by centrifugation)
Blood urea nitrogen
Creatinine
Alanine aminotransferase
Alkaline phosphatase
Glucose
Total calcium
Total protein
Bilirubin
Total thyroxine (T4)—cat
Potassium—cat
Serumelectrolytes
Phosphorus
Bicarbonate
Total carbon dioxide
Arterial blood pressure

Possible Additional Tests***Laboratory Tests**

Microalbuminuria
Heartworm as regionally and seasonally indicated
Fructosamine—cats
Endocrine function tests
Serology for fungal, rickettsial, other infectious diseases
Arterial or venous blood gases
Cholesterol, triglycerides
FeLV/FIV†
Additional hepatic function tests (e.g., bile acid assays)
Free thyroxine (T4) by equilibrium dialysis, thyroid-stimulating hormone, thyroid autoantibodies
Parathormone assay, ionized calcium
Serum protein electrophoresis

Other Assessments

Schirmer tear test
Tonometry
Radiography
Ultrasonography, echocardiography
Electrocardiography
Cytology, incisional or excisional biopsy, and histopathology‡
Other diagnostic procedures and imaging (e.g., Total Albumin laparoscopy, computed tomography, magnetic resonance imaging)

* Depending upon the clinical signs. Testing is not limited to only these items.

† FeLV=feline leukemia virus; FIV=feline immunodeficiency virus

‡ Fine-needle aspiration is recommended for any or all masses prior to surgery to ensure adequate margins are removed.⁴¹

Choosing Appropriate Treatments

Consider all of the pet's conditions and the best available scientific evidence when designing a treatment plan. Specifically, contradictions or contraindications among diseases, drugs, and diets may necessitate prioritizing modalities for an optimal outcome and/or quality of life.

- Avoid indiscriminate use of antimicrobial agents.
- Avoid drugs that may impair mobility and behavior or those that may change blood pressure (e.g., sedative, sympathomimetic, or anticholinergic drugs).
- Consider interactions, compatibilities, and incompatibilities among drugs and biologics.^{43,44}
- Nonsteroidal antiinflammatory drugs (NSAIDs) are commonly dispensed and can be beneficial for senior pets, but precautions include the following:
 - Monitor for potential complications, especially when the pet is known or suspected to have hepatic or renal disease, hyperadrenocorticism, or any condition that may predispose to gastrointestinal erosion or ulceration.

- Ensure that the client understands the vital importance of not changing the dose or type of NSAID without consulting the veterinarian.
- Avoid the concurrent use of two NSAIDs or the concurrent use of a corticosteroid with an NSAID, which potentially causes severe side effects.⁴⁵

Monitoring

Veterinarians and clients share responsibility for monitoring for side effects or complications. Require clients to closely monitor the intake of any medication administered in food. Cats in particular may develop food aversion if they are given medication by this route. Consider using flavored or formulated medications instead. Modify drug dose or dosing interval based on renal and hepatic function. Perform drug concentration testing when appropriate. Each disease state may require specific monitoring tests (e.g., fructosamine or blood glucose curve for diabetes mellitus; tonometry for glaucoma; blood pressure measurements for hyperthyroidism, chronic renal failure, and

heart disease). Consider the effects of each drug on other diseases (e.g., furosemide, NSAIDs, or methimazole on renal failure), and alter treatments as necessary based on response.

Additional Considerations

A formal hospital callback or client follow-up system is crucial to successful case management. Consider other resources such as consultation and/or referral to a specialist based on the type of disease, the veterinarian's level of expertise, and the available equipment (e.g., magnetic resonance imaging, computed tomography, endoscopy). The use of electronic media and communication to transmit and gather information facilitates remote consultations with specialists.

Anesthesia and Surgery

Peanesthetic Considerations

Patient Assessment. The importance of complete and accurate historical information cannot be overstated, including current medications (e.g., over-the-counter, prescription, alternative, supplements) with regard to their potential impact on anesthesia and recovery. Perform a complete and thorough physical examination, including assessments of weight, temperature, pulse, respirations, and pain.

Consider a preanesthetic blood pressure evaluation, especially in cats. Pay special attention to cardiopulmonary status. If any physical abnormalities are detected (e.g., heart murmur, arrhythmia, poor pulse quality, abnormal respiratory sounds), consider expanding the cardiopulmonary evaluation to include thoracic radiographs, electrocardiography, echocardiography, and/or blood pressure measurements.^{28,46} Whether a preanesthetic electrocardiogram is needed for pets without detectable abnormalities is uncertain. There is some evidence that conduction abnormalities may exist subclinically (especially in cats) or be overlooked because of animal disposition, operator error, etc.^{28,46} An electrocardiogram is strongly recommended when abnormalities are found on auscultation.

Laboratory Evaluations. All healthy senior pets should have wellness screening tests along with measurement of electrolytes and a platelet count, ideally within the 2 weeks preceding anesthesia. However, for healthy senior pets that have had routine wellness tests within the previous 6 months, the practitioner must determine which tests should be repeated or added, based on the pet's age (e.g., middle-aged versus senior), risk factors, and the procedure to be performed. In addition to any tests not done in the previous 6 months, a complete blood count and dipstick urinalysis with specific gravity should be repeated prior to anesthesia. Obtain at least a hematocrit and platelet count if surgery is planned. Remember that automated platelet counts are unreliable in cats, so if the platelet count is low, a manual recount should be performed. Consider further workup if test results are not within the normal ranges.⁴⁷

When anesthesia of a sick pet is necessary, perform the sick pet screening [Table 3] and compare the results to any earlier wellness screening tests. Perform additional tests as appropriate based on previous, ongoing, or new health issues discovered in the history, examination, and laboratory results. For example, perform coagulation function tests on at-risk animals, such as those with liver disease, malabsorption/maldigestion disorders, NSAID usage, and breed predisposition.

Client Communication. Before anesthesia, discuss all risks and benefits with the client and obtain written, informed consent for all procedure(s). Prepare postoperative instructions. Provide clients with clear, concise, verbal and written take-home instructions that include information about possible complications, drug effects, nursing care, nutritional management, home monitoring, and after-hours veterinary phone contact.

Patient Management. Create a plan for anesthesia, analgesia, intravenous fluid administration, antimicrobial therapy, and body temperature maintenance during surgery.^{48,49} Begin analgesia prior to induction of anesthesia, giving special consideration to the combination of systemic analgesia and local or regional anesthetic blocks. Perioperative pain is best controlled by an aggressive, preemptive, multimodal approach.^{50,51}

Intravenous access via an indwelling catheter is necessary for anesthetic induction, intraoperative fluid administration, and administration of appropriate medications. Initiate fluid preloading when indicated (e.g., renal disease, dehydration). When antimicrobial therapy is specifically indicated, begin the medication prior to surgery.^{52,53} Provide preoxygenation when indicated (e.g., obstructive upper airway disease, cardiac disease) via mask, oxygen cage, nasal cannula, or other methods. Ensure adequate ventilation via endotracheal intubation for general anesthetic procedures. Provide manually or mechanically assisted respiration as necessary.

Based on animal risk factors, consider placing an indwelling urinary catheter to measure fluid output during and after surgery, and/or the measurement of central venous pressure to prevent both under-hydration and over-hydration. Detailed attention to cardiopulmonary and renal functions is crucial for the successful outcome of anesthesia in senior animals. Close monitoring is essential during all stages of anesthesia. The greatest risks to the animal occur during the induction of anesthesia and from the time anesthetic agents are discontinued until full recovery.

During Anesthesia

One trained person should be dedicated to the monitoring and recording of vital parameters, such as body temperature, heart rate and rhythm, respiration, oxygen saturation via pulse oximetry, blood pressure, and end-tidal carbon dioxide. An apnea monitor is also helpful. Intravenous fluid support is essential, and care should be taken to customize the type and rate of fluids administered (e.g., lower rate with cardiac disease, increased rate with renal failure).^{54,55} Con-

tinue pain management, giving special consideration to constant-rate infusion of intravenous analgesics.

Postoperative/Postanesthetic Considerations

Maintain an open airway via intubation until the animal is swallowing. Continue oxygenation when appropriate, as described in the preanesthetic section of this report. Continue to maintain body temperature and to provide intravenous fluid support at least until the animal is ambulatory (or stable), or for longer as indicated (e.g., dehydration, hypothermia, renal compromise, other metabolic disorders).

Regularly monitor and record vital signs. Continue a preemptive and multimodal approach to pain. The adaptive mechanisms of animals make it difficult to accurately assess their degree and perception of pain; therefore, administer pain medications on a schedule appropriate for the drug(s) and the condition being treated. Do not wait for the animal to show signs of pain.⁵⁶⁻⁵⁸ Continue to assess the individual needs of each animal, as all individuals react differently to pain and to medications for pain.

Provide appropriate nursing care for recumbent animals, including warming and turning, human touch, and compassionate verbal encouragement. When recovery is delayed or prolonged, promote movement via massage, passive motion exercises, and sling-assisted walking.

Pain and Distress

Identify, prevent, and minimize pain. Use pain assessment as the fourth vital sign, using scales such as the University of Melbourne Pain Scale or the Glasgow Composites Measures Pain Scale.^{59,60} Under-managed or intractable pain may become a criteria for euthanasia.

Identification of Pain

Signs of acute or chronic pain vary and are described elsewhere.^{16,56,61-65} Any behavioral change or change in vital signs may be an indication of pain. Signs of pain may be modified by factors such as demeanor (e.g., stoicism) or concurrent drugs. Involve, educate, and continually communicate with the client about recognizing and monitoring for signs of acute and chronic pain.⁶⁶

Management of Pain

Treatment options vary depending on the type of pain (e.g., acute or chronic). Single drugs or combinations of drugs may be used. To intervene at multiple sites of the nociceptive pathways, use multiple drugs.⁶⁷ Control pain early in the course of chronic diseases. Chronic pain is best controlled by aggressive initiation of drugs and other modalities, followed by a tapering of the treatments to the minimum schedule or dosage that is still effective. Resources to help veterinarians keep current with new developments and recommendations for managing pain are becoming available, such as www.ivapam.com, which is maintained by the International Academy of Pain Management.

- Treatment modalities that may be applied for pain include oral, injectable, transdermal, or transmucosal drugs; physical therapy and massage; local and regional anesthesia; acupuncture; weight management where appropriate; and/or environmental modification such as a change in bedding, housing, access to the out-of-doors (e.g., ramp, lifting), etc.
- Drugs that may be utilized include NSAIDs, opioids, opiate derivatives, alpha-2 agonists, N-methyl-D-aspartate (NMDA) antagonists, anxiolytics and tricyclic antidepressants, anticonvulsants, bisphosphonates, and local anesthetics. Pain management should be integrated and complementary.⁶⁸

Continued Monitoring

Educate clients about possible adverse events and/or interactions of drugs. When appropriate, perform laboratory monitoring during drug therapy. Maintain and document communications with clients and reassess the animal frequently. Address anxiety on the part of the client regarding the pet's pain, disability, and/or physical impairment.

End-is-Near Issues

Hospice and Palliative Care

The American Veterinary Medical Association has published guidelines for veterinary hospice care.⁶⁹ Veterinary hospice care is defined as “giving clients time to make decisions regarding a terminal companion animal and to prepare for [its] pending death. The comfort of the animal must always be considered.”⁶⁹ In human medicine, “hospice and palliative care are considered to be the model for quality, compassionate care for those facing a life-limiting illness or injury.”⁷⁰ Palliative care, based on the animal's specific requirements, might include outpatient/home care; pain management; easy access to food, water, and litter; wound management; a stable and consistent environment; good hygiene and sanitation; clean bedding and padding; and mental stimulation. Visits to the home by veterinarians and/or support staff may be offered or encouraged whenever possible.

Nutritional maintenance is paramount. Balance the pet's need for a particular therapeutic diet with maintaining caloric intake. Reassess the need for all ongoing medications and treatments in pets with end-stage disease and an anticipated short life span. Consider whether medications should be reduced, stopped, or changed, particularly in light of their side effects and risk-benefit analysis. Medications or combinations of drugs that might otherwise be contraindicated or used cautiously (e.g., narcotics, NSAIDs) may be considered as the best or only choice for maintaining a good quality of life.

Personal Decision-Making

Provide guidance and resources for clients to deal with debilitating or chronic disease, with dying and death, and with euthanasia. Consider the client's state of mind and the

impact of the client on the pet. Consider and discuss the client's realistic ability (given financial, physical, and time constraints) to adequately care for the pet. Discuss the effect of the aged or sick pet on other pets and the potential impacts (both positive and negative) of introducing a new pet.

Discuss specific criteria for reevaluation of the senior animal and for deciding upon euthanasia. When possible, help the client consider end-of-life issues at this time (i.e., during the "anticipatory grief" period), rather than during a terminal crisis.

End of Life and Euthanasia

Making the Decision

During the euthanasia decision-making process and after the decision is made, provide the client with resources about the process and impact of euthanasia on the family and other pets. Such resources include web sites, hotlines, books, brochures, and professional counselors for both adults and children.⁷¹⁻⁷⁴ Web site examples include www.argusinstitute@colostate.edu, www.rainbowsbridge.com, www.aplb.org, and www.deltasociety.org. Examples of pet loss support hotlines include those at Washington State University (509-335-5704), the University of California-Davis (530-752-3602 or 800-565-1526), Tufts University (508-839-5302), the Chicago Veterinary Medical Association (630-325-1600), Cornell University (607-253-3932), and the Delta Society (619-320-3298).

Consider and discuss with the client the "five freedoms" to aid in assessing the animal's welfare and in making an ethical decision.⁷⁵ The five freedoms include freedom from hunger and thirst; freedom from physical and thermal discomfort; freedom from pain, injury, and disease; freedom from fear and distress; and the freedom to express normal behavior.⁷⁵ Assess the severity and duration of the animal's condition with these freedoms in mind and use them to help clients identify their own criteria for treatment or euthanasia. Such criteria might include financial, moral, religious, cultural, physical, and mental/emotional factors.

Avoid imposing one's own values and emotions on clients. Let clients make informed choices based on all known options. Support clients in their informed choice for euthanasia or for further diagnostic, therapeutic, or palliative care. Be an advocate of the pet and try to factually present options and consequences without promoting inappropriate feelings of regret, self-blame, or guilt.

When the Decision is Made

Discuss with the client the following points:

- The euthanasia process and choices, including: the option for sedation, intravenous catheter placement, home euthanasia or at the hospital, indoor or outdoor location for the euthanasia, the client's option to be present during and after the euthanasia
- Effects on other family pets and children
- Choices for disposal of the body, including the option of burial, cremation, and return of the remains

Describe specifically what will happen, what the animal may experience, and what the client may see or hear. Create an appropriate area in the hospital for euthanasia; a place the client can give the pet a final farewell. Consider providing the client with a remembrance item such as a paw print casting or lock of hair, followed by a sympathy card.

Veterinary Team Tips

Provide staff training and debriefing on the difficult issues that inevitably arise from being frequently exposed to end-of-life events. Such issues include grief management, pet loss support, periodic hospital memorial services, bereavement outlets, and compassion fatigue. Give the staff permission to grieve and express their emotions. Recognize each individual's limitations. Refer clients to outside resources when available.

Conclusion

This document is intended as a guideline only. Evidence-based support for specific recommendations has been cited whenever possible and appropriate. Other recommendations are based on practical clinical experience and a consensus of expert opinion. There is a need for further research to document some of these recommendations, and it is hoped that in the future, collaborative research involving general practitioners, referral institutions, and commercial laboratories will facilitate a more rapid and comprehensive development of evidenced-based clinical knowledge regarding senior pets.

Veterinarians must base their decisions and actions on their own expertise, experience, and knowledge. Veterinary practitioners are also charged with making decisions for each individual animal based on the best available scientific evidence, in conjunction with clinical experience.

The actual incidence of subclinical disease that is detected by routine screening tests remains undetermined. Practitioners are urged to develop systems for identifying and recording such conditions, perhaps in a collaborative effort with the commercial laboratory most frequently used. It is hoped that in the future such data will allow computation of the incidence, prevalence, risk factors, and effects of early detection and treatment of subclinical diseases.

References

1. The Path To High-Quality Care: Practical Tips For Improving Compliance. Lakewood CO: Am Anim Hosp Assoc Press, 2003.
2. American Association of Feline Practitioners/Academy of Feline Medicine, Panel Report on Feline Senior Care. http://www.aafponline.org/about_guidelines.htm.
3. Saker KE. Nutritional influences on the immune system in aging felines. *Compend Contin Educ Pract Vet* 2004;26(2Suppl A):11-14.
4. Twedt DC. The feline decline: what's normal, what's not. In: *The Science of Aging: Inside and Out*. Wilmington DE: Gloyd Group, 2004:6-14.
5. Hardie EM. New help for skinny old cats. In: *The Science of Aging: Inside and Out*. Wilmington DE: Gloyd Group, 2004:15-20.
6. Patronek GJ, Waters DJ, Glickman LT. Comparative longevity of pet dogs and humans: implications for gerontology research. *J Gerontology* 1997;52:B171-B178.

7. Hoskins JD, McCurnin DM. Geriatric care in the late 1990s. *Vet Clin North Am Small Anim Pract* 1997;27:273-281.
8. Araujo J, Studzinski C, Siwak C, *et al*. Cognitive function and aging in beagle dogs. *Proc Forum Am Coll Vet Intern Med*, Minneapolis 2004;22:375-377.
9. Tapp PD, Siwak CT, Estrada J, *et al*. Size and reversal learning in the beagle dog as a measure of executive function and inhibitory control in aging. *Learn Mem* 2003;10:64-73.
10. Tapp PD, Siwak CT, Estrada J, *et al*. Effects of age on measures of complex working memory span in the beagle dog (*Canis familiaris*) using two versions of a spatial list learning paradigm. *Learn Mem* 2003;10:48-160.
11. Head E, McCleary R, Hahn FF, *et al*. Region-specific age at onset of β -amyloid in dogs. *Neurobiol Aging* 2000;21:89-96.
12. Maher EW, Rush JE. Cardiovascular changes in the geriatric dog. *Compend Contin Educ Pract Vet* 1990;12:921-923.
13. Landsberg GM, Hunthausen W, Ackerman L. Senior care and cognitive dysfunction checklist. In: Landsberg GM, Hunthausen W, Ackerman L, eds. *The Handbook of Behavior Problems of the Dog and Cat*. 2nd ed. Philadelphia: WB Saunders, 2003:269-304.
14. Clark R, Stainer J. *Medical & Genetic Aspects of Purebred Dogs*. St. Simons Island GA: Forum Publications, 1994.
15. Siegal M, Richards J. *The Cornell Book of Cats*. 2nd ed. New York: Villard Books, 1997.
16. Wiseman-Orr ML, Nolan AM, Reid J, *et al*. Development of a questionnaire to measure the effects of chronic pain on health-related quality of life in dogs. *Am J Vet Res* 2004;65:1077-1084.
17. Radecki S, Donnelly R, Jensen WA, *et al*. Effect of age and breed on the prevalence of microalbuminuria in dogs. *J Vet Intern Med* 2003;17:406.
18. Langston C. Microalbuminuria in cats. *J Am Anim Hosp Assoc* 2004;40:251-254.
19. Companion Animal Parasite Council Guidelines. www.capcvet.org, 2003.
20. Centers for Disease Control Guidelines for Veterinarians: Prevention of Zoonotic Transmission of Ascarids and Hookworms of Dogs and Cats. Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention. www.cdc.gov/ncidod/diseases/roundworm/roundworm.htm.
21. Klingborg DJ, Husted DR, Curry-Galvin EA, *et al*. AVMA Council on Biologic and Therapeutic Agents' report on cat and dog vaccines. *J Am Vet Med Assoc* 2002;221:1401-1407.
22. Paul MA, Appel M, Barrett R, *et al*. Report of the AAHA Canine Vaccine Task Force: executive summary and 2003 canine vaccine guidelines and recommendations. *J Am Anim Hosp Assoc* 2003;39:119-131.
23. American Association Feline Practitioners/Academy of Feline Medicine Advisory Panel. Report on feline vaccines. www.aafponline.org, 2000.
24. Teske E, Naan EC, van Dijk EM, *et al*. Canine prostate carcinoma: epidemiological evidence of an increased risk in castrated dogs. *Mol Cell Endocrinol* 2002;29:251-255.
25. Kvat C, Haggstrom J. Acquired valvular heart disease. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:787-800.
26. Wolfsheimer KJ. Obesity. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:70-72.
27. Sisson DD, Thomas WP, Keene BW. Primary myocardial disease in the dog. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:874-875.
28. Fox PR. Feline cardiomyopathies. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:896-923.
29. Littman MP. Hypertension. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:179-182.
30. Pederson NC, Morgan JP, Vasseur PB. Joint diseases of dogs and cats. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:1862-1863.
31. Salisbury MA. Keratoconjunctivitis sicca. In: Bonagura JD, ed. *Kirk's Current Veterinary Therapy XII Small Animal Practice*. Philadelphia: WB Saunders, 1995:1231-1234.
32. DeBowes L. Dentistry: peridontal aspects. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:1127-1134.
33. Polzin DJ, Osborne CA, Lulich JP. Chronic renal failure. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:1634-1662.
34. Peterson ME. Hyperthyroidism. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:1400-1419.
35. Ling GV. Bacterial infections of the urinary tract. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia: WB Saunders, 2000:1679-1686.
36. Lekcharoensuk C, Osborne CA, Lulich JP. Epidemiologic study of risk factors for lower urinary tract diseases in cats. *J Am Vet Med Assoc* 2001;218:1429-1435.
37. Lekcharoensuk C, Osborne CA, Lulich JP. Patient and environmental factors associated with calcium oxalate urolithiasis in dogs. *J Am Vet Med Assoc* 2000;217:515-519.
38. Padrid P. Diagnosis and therapy of canine chronic bronchitis. In: Bonagura JD, ed. *Kirk's Current Veterinary Therapy XII Small Animal Practice*. Philadelphia: WB Saunders, 1995:908-909.
39. Feldman EC, Nelson RW, eds. *Canine and Feline Endocrinology and Reproduction*. 3rd ed. Philadelphia: WB Saunders, 2003.
40. McEwen B. Five-year retrospective necropsy survey of tumors in dogs. *Newsletter Animal Health Laboratory: University Guelph Laboratory Services*, 2004;8:32.
41. Withrow SJ, MacEwen EG, eds. *Small Animal Clinical Oncology*. 3rd ed. Philadelphia: WB Saunders, 2001.
42. *The Path To High-Quality Care: Practical Tips For Improving Compliance*. Lakewood CO: Am Anim Hosp Assoc Press, 2003.
43. Plumb D. *Veterinary Drug Handbook*. 4th ed. Ames IO: Iowa State University Press, 2002.
44. Idexx Interactive Formulary. www.anmlr.com, 2004.
45. Boothe DM. *Small Animal Clinical Pharmacology and Therapeutics*. Philadelphia: WB Saunders, 2001.
46. Tilley LE. *Essentials of Canine and Feline Electrocardiography*. 3rd ed. Malvern PA: Lea & Febiger, 2001:110.
47. Knoll JS. Clinical automated hematology systems. In: Feldman BF, Zinkl JG, Jain NC, eds. *Schalm's Veterinary Hematology*. Baltimore: Lippincott, Williams and Wilkins, 2000:11.
48. Machon RG, Raffe MR, Robinson EP. Warming with a forced-air warming blanket minimizes anesthetic-induced hypothermia in cats. *Vet Surg* 1999;28:301-310.
49. Cabell LW, Perkowski SZ, Gregor T, *et al*. The effects of active peripheral skin warming on perioperative hypothermia in dogs. *Vet Surg* 1997;26:79-85.
50. Shafford HL, Lascelles BDX, Hellyer PW. Preemptive analgesia: managing pain before it begins. *Vet Med* 2000;94:478-492.
51. Lascelles BDX, Jones A, Morris R, *et al*. Postoperative central hypersensitivity and pain: the preemptive value of pethidine for ovariohysterectomy. *Pain* 1997;73:461-471.
52. Brown DC, Conzemius MG, Shofer F, *et al*. Epidemiologic evaluation of postoperative wound infections in dogs and cats. *J Am Vet Med Assoc* 1997;210:1302-1306.
53. Nicholson M, Beal M, Shofer F, *et al*. Epidemiologic evaluation of postoperative wound infection in clean-contaminated wounds: a retrospective study of 239 dogs and cats. *Vet Surg* 2002;31:577-581.
54. DiBartola S, ed. *Fluid Therapy in Small Animal Practice*. 2nd ed. Philadelphia: WB Saunders, 2000.
55. Thurmon JC, Tranquilli WJ, Benson JG, *et al*, eds. *Lumb & Jones Veterinary Anesthesia*. 3rd ed. Baltimore: Williams & Wilkins, 1996.
56. Mathews KA. Relieving pain: assessment and management of post-operative pain in dogs and cats. Guelph, Ontario: Jonkar Computer

- System, 1998.
57. Hansen BD, Hardie EM, Carroll G. Physiologic measurements after ovariectomy in dogs: what's normal? *Appl Anim Behav Sci* 1997;51:101-109.
 58. Hardie EM, Hansen BD, Carroll G. Behavior after ovariectomy in the dog: what's normal? *Appl Anim Behav Sci* 1997;51:111-128.
 59. Firth AM, Haldane SL. Development of a scale to evaluate postoperative pain in dogs. *J Am Vet Med Assoc* 1999;214:651-659.
 60. Holton L, Reid J, Scott EM, *et al.* Development of a behaviour-based scale to measure acute pain in dogs. *Vet Rec* 2001;148:525-531.
 61. Holton LL, Scott EM, Nolan AM, *et al.* Comparison of three methods used for assessment of pain in dogs. *J Am Vet Med Assoc* 1998;212:61-66.
 62. Holton LL, Scott EM, Nolan AM, *et al.* Relationship between physiological factors and clinical pain in dogs scored using a numerical rating scale. *J Small Anim Pract* 1998;39:469-474.
 63. Matthews K, Dyson D. Animal pain: figuring out what is going on. *Proc Managing Pain Symp*, Denver 2003:7-28.
 64. Gingerich DA, Strobel JD. Use of client-specific outcome measures to assess treatment effects in geriatric, arthritic dogs: controlled clinical evaluation of a nutraceutical. *Vet Ther* 2003;4:56-66.
 65. Hielm-Bjorkman AK, Kuusela E, Liman A, *et al.* Evaluation of methods for assessment of pain associated with chronic osteoarthritis in dogs. *J Am Vet Med Assoc* 2003;222:1552-1558.
 66. Matthews K, ed. Management of pain. *Vet Clin North Am Small Anim Pract* 2000;30:703-970.
 67. Lascelles BDX, Main DC. Surgical trauma and chronically painful conditions - within our comfort level but beyond theirs? *J Am Vet Med Assoc* 2002;221:215-222.
 68. AAHA Pain Management Standards. From the AAHA Standards of Accreditation: Quality of Care, Pain Management. Lakewood CO: Am Anim Hosp Assoc Press, 2003.
 69. AVMA Membership Directory and Resource Manual. Schaumburg IL, 2004:111.
 70. What is Hospice and Palliative Care? The National Hospice and Palliative Care Organization. www.nhpco.org, 2003.
 71. Lagoni L, Butler C, Hetts S. *The Human-Animal Bond and Grief*. Orlando: Harcourt Brace, 1994.
 72. Ross C. *Pet Loss and Human Emotion: Guiding Clients Through Grief*. Boca Raton FL: Taylor & Francis, Inc., 1998.
 73. Lagoni L. *The Practical Guide to Client Grief: Support Techniques for 15 Common Situations*. Lakewood CO: Am Anim Hosp Assoc Press, 1997.
 74. Stewart MF. *Companion Animal Death: A Practical and Comprehensive Guide for Veterinary Practice*. St. Louis: Elsevier, 1999.
 75. The Five Freedoms. www.fawc.org.uk.