



Health Maintenance Programs for Dogs

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Introduction

The focus of the veterinary medical profession must change from managing disease to maintaining health.

People's interest in their own health care, including proper nutrition and exercise, is being carried over to their pets. The public increasingly looks to veterinarians for advice and services that relate to maintaining pet health. With a solid foundation in the fundamentals of maintaining health, veterinarians will: 1) improve the overall quality of practice, 2) help pets live longer, more enjoyable life, 3) increase client satisfaction and 4) improve the economic well-being of the practice.

Health maintenance, disease prevention and risk factor management are terms used to describe concepts and programs that attempt to promote health, or wellness, in an individual or group. The health maintenance concept contrasts with the traditional veterinary perspective, which focuses on diagnosing, curing or managing individual diseases.

The goals of health maintenance programs are to: 1) identify health risk factors and reduce or eliminate them and 2) detect disease early. Health maintenance involves all aspects of a pet's health,

including genetics, environment, history and age, oral care and nutrition. Historical information about individual pets, physical examination findings and extended laboratory databases are essential elements of a health maintenance program. This article will explore the concepts of risk factor management, health maintenance or wellness programs, important components of such programs and the role of appropriate lifestage nutrition.

Risk factor Management

Detection and management of health risk factors are intrinsic to health maintenance. Risk factor management has been readily accepted in human medicine, but must be extended to dogs and cats as well.

Nutritional risk factors may also occur in pets. Examples include excess phosphorus intake as a risk factor for progression of subclinical renal disease and excessive energy and calcium intake as risk factors for orthopedic disease in large- and giant-breed puppies.

There are two complementary approaches to reduce risk factors in the pet population: 1) the population-based approach is aimed at the general pet population and 2) the high-risk or individual-based approach is aimed at individuals with defined risk profiles.

Putting the Concept into Action

Vaccinations and internal and external parasite control are traditional health maintenance services offered by veterinarians. But many other services, from advising clients about pet selection to provide prophylactic oral care, are important to an effective health maintenance program. The services provided in a health maintenance program for dogs will vary tremendously depending on the use of the animal (e.g., house pet vs. athlete vs. show animal), the environment in which the animal resides (e.g., strictly indoors vs. mostly outdoors) and the animal's age.

Helping Clients Choose A Pet

Veterinarians are sometimes consulted by prospective pet owners and clients about the proper animal for their lifestyle and perceived needs. On the surface, advice about pet selection may not seem important to a health maintenance program. However, many pets are abandoned, euthanized, taken to humane shelters or returned to the pet store, breeder or original

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owner because the pet's behavior was considered inappropriate. Behavioral problems not only contribute to owner dissatisfaction but often adversely affect the health of pets. Different breeds have different behavioral characteristics. It is worth the effort to find a breed with characteristics that suit an owner's environment, lifestyle and preferences. In addition to advising individual clients, veterinarians should also create hospital and community education programs for pet selection.

Screening for congenital Defects

Congenital defects are caused by hereditary factors, environmental factors or their interaction. Within species, factors such as breed, body system, level of nutrition and geographic location modify the total number of congenital defects and the frequency of individual defects. The frequency of individual defects varies among breeds. In one study the overall rate of congenital defects was 15.1% for purebred puppies on arrival at a pet store.

The range of congenital defects is wide; the most commonly identified defects involve the central nervous, ocular, muscular, skeletal, gastrointestinal (dental) and cardiovascular systems. Patellar luxations, eyelid abnormalities, cryptorchidism, hernias and faciodental malformations were most commonly observed in purebred puppies at a pet store.

Genetic Screening

Large-scale genetic screening programs in combination with selective breeding practices are effective means of eliminating or reducing the prevalence of certain inherited diseases. Health maintenance programs should include screening protocols for these diseases. The level of individual screening will be determined by the animal's use. A breeding animal will usually be screened for genetic disorders more vigorously than an animal used as a pet or for performance.

Hip dysplasia results from the interaction of hereditary, environmental and nutritional factors. Routine screening protocols include radiographic procedures to detect coxofemoral joint changes in young adult dogs. Closed registries exist in many countries to certify individual animals as free of radiographic evidence of hip dysplasia. Newer techniques allow the screening of dogs for passive coxofemoral joint laxity at an earlier age. Increased passive hip laxity and over nutrition are risk factors for development of hip dysplasia.

Distichiasis, cataracts, progressive retinal atrophy

and congenital ectasia are examples of ocular problems that can be identified by specific ophthalmic examination.

Recent advances in genetic screening include molecular genetic approaches using DNA markers and open disease registry.

Behavioral Counseling

Behavior is an inseparable blend of inherited (species specific) and learned components. Behaviors most closely tied to the survival of the species tend to be inherited. Still, the expression of these behaviors can be shaped by learning. Most behavioral problems are not due to abnormal behavior, but to normal species specific behaviors that are incompatible with human behavior.

Taking the Environment into account

The environment in which the pet resides will profoundly influence the health of the animal. Pets housed strictly indoors are less susceptible to environmental extremes such as weather, attack from other animals or people, motor vehicle accidents and other forms of trauma. Animals that roam or are housed outdoors are at increased risk for traumatic and weather-related injuries.

Vaccinating Against Disease

Routine vaccinations have been the part of pet health maintenance programs that have received the most attention from veterinarians in the past. Vaccines used in dogs protect against distemper, adenovirus, infectious hepatitis, parainfluenza, leptospirosis, parvovirus, rabies, coronavirus-induced diarrhea, bordetellosis. Factors that influence the choice of vaccines include local disease incidence, cost, efficacy, exposure to other animals and perceived risk.

Annual revaccination is encouraged after an initial vaccination series is completed in juvenile animals. Rabies vaccination protocols vary with the vaccine used and local laws. Veterinarians should remind clients that vaccination does not always equal immunization and a small percentage of dogs will not be protected by these procedures.

Parasite Control

External parasites of major concern to pets and their owners include fleas, ticks and ear mites. These parasitic infestations are so common that client education brochures should be developed to help clients understand parasite life cycles and parasite control programs. Environmental treatment is the key to flea control, yet many veterinarians spend little time discussing this treatment with pet owners.





In heartworm endemic areas, prevention programs should be started when animals are young and continued in adult pets. Adult animals should be examined annually for evidence of heartworm infection regardless of whether they are receiving preventive medication. An annual fecal examination is recommended to screen the pet for intestinal parasites. Intermediate host control (e.g., flea control) should be emphasized to clients when cestodes are recognized as problem.

Neutering

One of the major decisions an owner has to make that may affect a pet's health and longevity is whether to neuter the pet. The influence of neutering on behavioral characteristics, longevity and specific diseases has been reviewed. This information should be shared with clients and routine neutering advised for the vast majority of pets.

Behavioral characteristics most influenced by neutering include roaming, canine urine marking and intermale aggression. Pet owners should be informed that neutered pets live longer. Mean age at death was also higher in neutered vs. intact dogs, but to a lesser extent than in cats.

Neutering pets at an early age will prevent the occurrence of virtually all tumours of the reproductive tissues, with the notable exceptions of canine prostatic adenocarcinoma.

Testicular tumours are the second most common neoplasm affecting male dogs. Testicular neoplasms represent 5 to 15% of tumors recorded in male dogs.

Mammary gland tumors are the most common tumours in female dogs. Malignant mammary tumours are by far the leading form of cancer in dogs. Ovariectomy performed before the first estrus virtually eliminates the risk of mammary tumor development in dogs.

Oral Care

Periodontal disease is the primary cause of early tooth loss in dogs. Researchers have found periodontitis in more than 80% of dogs six years of age and older. This disease is often an incidental finding during the physical examination and may not be considered clinically important until the disease has led to extreme tooth mobility or tooth loss. Periodontal disease of this degree is generally found in older pets, leading to the erroneous conclusion that it is a geriatric condition. Gingivitis, a reversible form of periodontal disease, develops at one to two years of age and progress to periodontitis (an irreversible change) by four to six

years of age.

Grooming

Although it is true that the skin and coat reflect general health, many vigorous, normal pets have unkempt coats. The most important factor in causing an unkempt coat in an otherwise healthy pet is the coat type. A short coat retains reasonable condition with minimal care whereas some longer coat types require frequent grooming to remain in good condition. Unkempt, poorly groomed coats are risk factors for external parasites and dermatologic problems.

Normal grooming procedures for the individual's coat type should be discussed with the pet owner as part of a health maintenance program for young dogs. Grooming procedures will vary because of the variety of coat types among breeds. Clients should be told to spend a few minutes each day grooming their pets rather than several hours sporadically.

Proper training can make a world of difference in the ease of grooming, including nail trimming. Good behavior during grooming and nail trimming is most easily established during the socialization phase.

Prospective pet owners should consider grooming problems before purchasing a pet. If time and expense are likely to be problems, one should not choose a pet from a long-haired or wiry-or-wooly-coated breed, but instead should select a short-coated, easy-to-groom animal.

Extended Databases

Laboratory and other diagnostic tests can help to identify health risk factors and early evidence of disease.

In geriatric patients, the extended database should include a complete blood count and serum biochemistry profile. Thoracic radiographs and echocardiograms are included if a cardiac murmur is detected or if there is a history of cough or abnormal respiratory pattern in older pets.

Nutrition counseling

The importance of nutrition in a complete preventive health care program for pets is well-documented. Malnutrition and infection were found to be synergistic. When they occur concurrently, the effects are worse than the sum of the effects of each occurring separately. Protein and energy deficiency will consistently suppress cell-mediated and humoral immunity. Excesses of certain nutrients will also compromise immune responsiveness and may contribute to or promote certain diseases. This finding reinforces the concept that optimal nutrition during





all stages of life is an important part of any health maintenance program.

An association between nutrients and certain common illnesses also exists for dogs. This concept of "ignoring" most nutrients and focusing on a few key nutrients is even more appropriate for dogs because most pets are fed commercially prepared food that usually meets minimum allowances for all nutrients.

Seeding for optional Growth

Dogs are overfed during growth may be at risk for obesity. Puppies that develop large numbers of adipocytes (fat cells) during growth may be predisposed to obesity as adults.

Avoiding Excess Energy

Large- and giant-breed puppies are at risk for developmental orthopedic disease when undergoing rapid growth. Optimal skeletal development is more likely to occur if growth is slowed. These puppies should not be fed *ad libitum*. Fat and energy intake should be limited by restricting the total amount of food the puppy eats each day and using a food that does not contain excessive levels of energy.

Avoiding Excess Calcium

Excessive calcium intake is also a risk factor for developmental orthopedic disease. Large- and giant-breed puppies should receive food without excessive levels of calcium (recommend 0.9 to 1.2% calcium in the dry matter). Dietary supplements that contain calcium should be avoided.

Feeding Adult Animals

Avoiding Obesity

Obesity is the most significant clinical problem associated with malnutrition in adult dogs. A high-fibre, low-fat food is low in caloric density, prolongs eating time and induces satiety. For some canine breeds or in some situations it may be advisable to recommend this type of food shortly after the animal reaches skeletal maturity. Obesity prevention is an important goal in feeding adult dogs, and should be aggressively pursued in dogs with multiple risk factors.

Avoiding Renal Disease

Renal disease is a significant cause of nonaccidental death in dogs and cats. Research in dogs with advanced renal disease has shown that decreasing the level of dietary phosphorus slows progression and reduces the severity of renal disease, thereby lengthening the pet's life. Limiting excess phosphorus throughout an animal's adult life may reduce progression of renal disease in its earlier stages when diagnosis is difficult. Avoiding

excess dietary protein, sodium and chloride throughout adulthood may also slow progression of renal disease.

Periodontal disease and associated problems, such as oral malodor, are the most common diseases of adult dogs. A combination of veterinary care (routine dental examination and cleaning) and home care (brushing and dietary cleansing) are essential to maintain oral health. Appropriate treats and chews are most commonly used for dietary cleansing.

Feeding Reproducing Females

Malnourishment, before and during gestation, may be an important contributory factor to the 20 to 30% mortality rate of neonatal puppies and kittens. The demands of gestation and particularly lactation drastically alter a female's nutritional requirements.

Feeding a growth/lactation food is most important during the last three to four weeks of gestation. The most common errors during gestation are overfeeding and excessive supplementation. Supplementation is not routinely needed.

Feeding Stressing Animals

Ambient temperature extremes, racing, hunting, working livestock, police and sentry duty, guiding the blind and touring on the show circuit are physical and psychological stresses that may increase a dog's requirement for energy and other nutrients. Palatable, nutritionally dense and highly digestible foods are desirable for dogs undergoing these stresses. Significantly better endurance occurs when dogs are fed highly digestible, high-energy foods (stress/performance foods).

Systems Review in Ageing Pets

Endocrine System

Endocrinopathies are common in middle-aged and older pets. Hyperadrenocorticism usually occurs in dogs older than six years, with the median incidence in seven- to nine-year-old dogs. Adrenocortical tumors are most common in geriatric dogs (median age 10 to 11 years).

Hypothyroidism occurs most commonly in middle aged to old, medium- to large-breed dogs within the age range of four to 10 years.

Cardiovascular system

Cardiovascular disease is common in geriatric animals and frequently leads to clinical problems. About one fourth of all heart disease in dogs occurs between the ages of nine and 12 years, with one-third occurring in dogs 13 years of age and older. Chronic





degenerative valvular disease is the most common cardiovascular lesion causing heart failure in old dogs.

Hypertension occurs most commonly in older pets secondary to chronic renal disease and endocrinopathies. Patients with heart disease, congestive heart failure or hypertension may benefit from avoiding excess dietary sodium and chloride.

Musculoskeletal System

Owners commonly complain of lameness, stiffness and paresis in their geriatric pets. Degenerative joint disease is the most common disorder of the musculoskeletal system. Prevention or treatment of obesity is an important goal in patients with degenerative joint disease. Nutritional modification may attenuate the inflammatory process in some patients with osteoarthritis.

Gastrointestinal System

Periodontal disease is the most common disease in pets over two years of age. Periodontitis, which is irreversible, is the most common form of periodontal disease in geriatric pets. Oral health care programs should be started early to acclimate pets to oral manipulation and to minimize or prevent dental problems seen in geriatric patients. Among these are generalized stomatitis, resorptive lesions of the teeth and certain viral diseases that affect the mouth and tongue.

Constipation is common in older pets. It may be caused by foods, drugs, neuromuscular disease, metabolic disease, pelvic and perineal pain, obstruction of the colon, rectum, or anus and other miscellaneous factors. Pancreatitis is also a gastrointestinal disease that occurs more commonly in middle-aged and older dogs. Constipation and large bowel disease are examples of gastrointestinal disorders that may respond to increased levels of dietary fibre.

Integumentary System

The most common skin neoplasms of dogs are, in approximate descending order, lipoma, mast cell tumor, sebaceous gland hyperplasia and adenoma and papilloma.

Urinary System

Kidneys of geriatric animals and people are smaller and lighter than those of younger individuals, have fewer glomeruli, have a decreased tubular size and weight and have increased mesangium and fibrosis. These structural changes are associated with decreased concentrations of renin, aldosterone and activated vitamin D have also been found. Because renal failure is primarily a disease of older animals, standard

recommendations for the conservative management of renal failure were formulated with this in mind and can usually be followed when treating geriatric animals. The nutritional management of patients with chronic renal failure should include a food that avoids excesses of dietary phosphorus, protein and sodium chloride.^{53,54}

Reproductive System

Reproductive disorders are common in middle-aged and older dogs. Prostate disease is most common in dogs older than five years, with an average age at occurrence of 9.3 years. Prostatic cancer is seen primarily in dogs older than 10 years.

Geriatric females also develop reproductive disorders. Pyometra has a mean age of occurrence of 7.2 and 7.8 years in dogs and cats, respectively. Use of progestational compounds is a risk factor for development of pyometra at an earlier age. The most common tumor in female dogs is of mammary gland origin. The approximate median age of dogs with mammary tumors is 10 to 11 years. Mammary tumors occur in dogs two to 20 years old, but their occurrence in bitches less than five years old is uncommon.

Respiratory System

Obesity may complicate chronic respiratory disease seen in older dogs. Weight-reduction programs to achieve an ideal body weight may help individual dogs with chronic cough. Experimentally, salt intake appears to influence bronchial hyperactivity; low-salt foods have a favorable effect in some people with asthma. Avoiding excess dietary sodium chloride in dogs and cats with chronic bronchial disease may be helpful.

Central Nervous System

Diseases of the central nervous system that occur predominantly in middle-aged and older dogs include degenerative myelopathy and intervertebral disk disease. Degenerative myelopathy is seen mostly in German shepherd dogs older than five years, whereas disk disease is seen in older dogs belonging to chondrodystrophoid breeds.

Special Senses

The probability of vision loss increases with age. This probability rises dramatically in 12- and 13-years-old dogs because of age-related cataract formation. Further, dogs with pre-existing ophthalmic disorders such as hereditary cataracts, retinal degenerative diseases, glaucoma and opacifying keratopathies are now living longer than ever before. Thus, it is common for an owner of an elderly pet to have to cope with general age-related medical problems and vision loss.





In some cases, owners may not be aware of vision loss in their aged pet until the animal's environment is changed.

Many owners of blind, aged pets also complain of concomitant hearing loss. One author believes that hearing loss often precedes the vision loss, but the hearing loss is not appreciated until vision loss is combined with it.

Feeding Recommendations

Manufactured pet foods contain more than adequate levels of all the essential nutrients needed by normal dogs. In fact, dogs fed commercial rations are consuming anywhere from: 1) three to five times their daily protein requirement, 2) three times the daily calcium and phosphorus requirements, 3) two to five times the minimum requirements of vitamins and 4) 10 times the daily requirements of Sodium Chloride.⁴⁵ The geriatric pet, may benefit from a food that avoids excess levels of phosphorus, protein, calcium, sodium

and chloride.

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6	Pomeranian	Pomerania	12	4.5-5
7	Pug USA	10-11	14	
Utility dogs				
1	Bull dog	England & USA	12-14	50-55
2	Chow Chow	China	18	55-60
3	Dalmatian	England	22-24	24-28
4	French Bulldog	France	12	24-28
5	Lhasa Apso	Tibet	10	13-15
6	Poodle Miniature	France	11-15	26
7	Poodle Standard	France	15	49
8	Poodle Toy	France	11	15
Working dogs				
1	Bearded Collie	England & USA	20-22	
2	Boxer USA	21-23	62	
3	Bull Mastiff	Britian	24-26	90-100
4	Doberman	Germany	25.5-27	66-80
5	German Shepherd	Germany	24-26	77-85
6	Great Dane	Germany	28-30	110-120
7	Hungarian Puli	Hungary	14-16	22-28.5
8	Mastiff	England	27.5-30	175-190
9	Rottweiler	Germany	23-27	110
10	Rough Collie	England & USA	20-22	40-55
11	Smooth Collie	England & USA	18-19.5	35-45
12	St Bernard	Switzerland	25.5-27.5	110-121
13	Welsh Corgi Cardigen	Welsh	12	19
14	Welsh Corgi Pembroke	Welsh	10-12	18-24

