

Preventive Medicine – Why is it important and where do we start?



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Def'n of Preventive Medicine

- Wikipedia: measures taken for disease prevention, as opposed to disease treatment
- American College of Preventive Medicine: to protect, promote, and maintain health and well-being and to prevent disease, disability, and death.

Terminology

- Debate over terminology
 - Wellness? Preventive? Preventative?
- Preventive/Preventative testing suggests more purpose to the owner, and is arguably more actionable
- AAHA/AVMA refers to Preventive Healthcare Guidelines
- Definition of Preventive Healthcare: measures taken for disease prevention, as opposed to disease treatment.
- Are we preventing disease? Usually we are trying to initiate treatment early to slow progression.

Minimum Database

- Minimum database involves the assessment of blood and/or urine (and other things..) of a healthy patient for any detectable abnormalities
This is often recommended on a yearly basis, in many cases starting at middle age
- Similar parameters are also recommended prior to general anesthesia, termed “Pre-anesthetic Minimum Database” or similar

Perception of Preventive Med

- In human medicine and dentistry, the value of preventive medicine and early intervention in certain circumstances is well established and accepted by the general public
- In veterinary medicine, the importance of this type of monitoring has not been communicated as effectively
 - Over the past decade, there has been a decline in the number of appointments for pet owners

Preventive Healthcare

- 2011 AAHA/AVMA preventive healthcare
 - all dogs/cats should have an annual veterinary examination
 - recommended 'early disease screening tests' and 'geriatric screening tests' but no specific age or testing parameters given (but stay tuned!)
- Biggest issue – lack of communication and education of owners, internet “self treatment”

Routine Vet Visits

- Certain “preventable” diseases are more prevalent (and there are likely many others)
 - Obesity (+/- DM)
 - Dental disease
 - Parasitism
 - Otitis externa
- It has been proposed the routine veterinary visits will reduce the incidence of these types of diseases

Early Detection

- It has been proven that early detection and intervention can dramatically improve the outcome for certain diseases
 - Renal disease
 - Osteoarthritis
 - Periodontal disease
- Many clients reserve visits to the vet only for vaccination and overt disease

Examples of occult disease

- Protein-losing nephropathy
- Chronic renal failure
- Chronic hepatitis
- Intestinal lymphangiectasia
- Hyperlipidemia
- PSS/Microvascular Dysplasia
- Hypercalcemia and
Urolithiasis

Protein-losing nephropathy

- Loss of significant amounts of protein from the kidneys
- Can result in hypoalbuminemia, thromboembolism, and renal failure
- Often also have hypertension
- Usually due to glomerulonephritis or amyloidosis (and also Lyme Disease)
- In randomly selected dogs, there is an incidence of 43-90% with glomerular lesions

Protein-losing nephropathy

- UPC of > 0.2 abnormal with no sediment
- May also find hypoalbuminemia, azotemia, hyperphosphatemia, anemia, thrombocytosis, hypercholesterolemia, dilute urine
- Renal biopsy not always recommended (4Dx)
- Treatment with an ACEi or ARB, low protein diet, omega-3 fatty acids, and aspirin
- Improved prognosis with early treatment

Chronic renal failure

- Common in older cats and dogs
- 49% of cats over 14 years have CRF
- Many cases are presented to their vets with increased drinking and urination
- A small proportion of pets are diagnosed with CRF without any clinical signs
 - Likely more common in households with multiple animals where changes in drinking and urination will be less obvious

Chronic renal failure

- Research has shown that use of a low protein diet, and controlling hypertension, will improve the prognosis in cases of CRF
- Instigation of these treatments is likely most beneficial early in the course of disease
- This highlights the importance of a paired urinalysis with routine blood work



Chronic hepatitis

- Common causes of chronic hepatitis include immune-mediated disease and copper-associated hepatitis
- Middle aged dogs (3-7 yo)
- Doberman Pinscher, Bedlington Terrier, etc
- CH is a slow, insidious process with typically no clinical signs until very late-stage
- Many cases have evidence of intermittent elevation in ALT long term
 - 90% have ALT 5-18 times normal

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Chronic hepatitis

- Liver biopsy with aerobic/anaerobic culture is required for definitive diagnosis
 - Ultrasound-guided
 - Surgical (keyhole approach)
 - Laparoscopy
- Can be difficult to convince owners to perform biopsy due to cost/invasiveness
- Evidence that early intervention will delay or halt development of cirrhosis, significant impact on survival

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Chronic hepatitis - treatment

- Early stage
 - anti-inflammatory (glucocorticoid, ~cyclosporine)
 - choleric and anti-inflammatory (ursodiol)
 - anti-oxidant (sAMe)
 - +/- copper-chelating agent
- Late stage
 - diuretic (spironolactone)
 - +/- anti-fibrotic (colchicine)
 - supportive (antiemetic, appetite stimulant, etc)
 - low protein diet

Intestinal lymphangiectasia

- Dilation of intestinal lymphatic vessels
- Typically congenital (primary)
- Yorkshire Terrier, Norwegian Lundehund
- Gradual progression to malabsorption, resulting in panhypoproteinemia
- Many cases have significant blood work changes without clinical signs
- Some suggestive ultrasound findings
- Diagnosis is via intestinal biopsy

Intestinal lymphangiectasia

- Treatment is via severely fat restricted diet
 - RC GI Low Fat diet, Rayne Low Fat Kangaroo diet, Hill's i/d Low Fat diet
 - Weight control diets are NOT appropriate
- Prednisone can be useful in poorly responsive cases (+/- cyclosporine)
- Diuretics in end-stage disease
- Prognosis very variable



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Hyperlipidemia

- Most common cause is post-prandial, so must have 12 hour fast, and ideally 24 hour fast
 - Triglyceride levels are not included in most panels
- Pathologic fasting hyperlipidemia is common in older Miniature Schnauzers
- May be linked to formation of gall bladder mucocele in Shetland sheepdog (another occult disease)

Hyperlipidemia

- Reasons to suspect hyperlipidemia:
 - Marked lipemia noted when serum spun, or results received, especially if fasted
 - Elevated cholesterol level, especially if fasted
 - At risk breed
- Can lead to pancreatitis, thromboembolism
- Treatment is via severely fat restricted diet
 - RC GI Low Fat diet, Rayne Low Fat Kangaroo diet, Hill's i/d Low Fat diet
- Good prognosis in most cases

Hypercalcemia

- Causes of hypercalcemia include:
 - Cancer (anal gland, lymphoma)
 - Primary hyperparathyroidism
 - Hypoadrenocorticism
 - Renal disease
 - Vitamin D toxicosis
 - Idiopathic (especially cats)
 - Osteomyelitis (rare)
 - Lab error

Hypercalcemia

- Often symptoms are not present
- Some clients recognize symptoms after diagnosis and correction of disease
 - Polyuria/polydipsia
 - Weakness
 - Decreased activity
 - Decreased appetite
 - Weight loss/muscle wasting
 - Vomiting
 - Shivering or trembling

Hypercalcemia

- Concerns about delayed treatment
 - Urolithiasis (often occult)
 - Calcium deposition of organs
 - Progression of disease – cases with cancer in particular
 - ie Anal sac adenocarcinoma best treated surgically, therefore best prognosis when small and not metastasized into sublumbar lymph nodes

Role of Preventive Medicine

- The frequency and compliance of preventive medicine programs are **practice driven**, and requires proactive education and a **team approach**
- The importance of a preventive medicine program is becoming more evident as we move away from yearly vaccination
- But is preventive medicine even justified? Do we have data to prove that it is in the pet's best interest?

Data on Preventive Medicine

- A 2012 study evaluated blood and urine testing in mature Golden Retriever dogs
- Almost half of the dogs (49%; 26/53) had laboratory changes that indicated potentially significant disease that warranted either monitoring or further diagnostic evaluation
- This study stated that a larger study evaluating more animals and also varying breeds would be beneficial in setting specific guidelines

Data on Preventive Medicine

- A 2012 study evaluated PE and urine testing in 45 geriatric dogs 9 years and older.
- At least one previously unrecognized problem was detected in 80% of dogs.
- This study stated that veterinarians cannot rely on owners to report common signs of age-related diseases and should consider running screening clinics for elderly patients and educate clients in recognition of important signs (pain, polyuria, decreased mobility).

Data on Preventive Medicine

- A 2017 study evaluated various parameters in 41 senior and 59 geriatric dogs.
 - PE, MDB, BP and fundic exam
- This study concluded that results clearly indicated the need for regular health checks of apparently healthy elderly dogs to improve early disease detection.
- Should at minimum include thorough history, extensive PE, and complete blood and urine examinations.

Middle aged animals?

Recent study evaluating wellness testing in the dog and cat (406 dogs, 130 cats)

- Dogs (5-8 yo)
 - 6.2% had clinically significant abnormalities
 - 86% had abnormal values
- Cats (6-9 yo)
 - 19.2% had clinically significant abnormalities
 - 76% had abnormal values
- Anemia, inflammation, hepatopathy, renal and pancreatic disease

Aust Vet J 2016

All ages?

- In 2011, our internal medicine service performed a study with the goal of determining the benefits of yearly blood testing
- A second goal was to take the data and utilize it to make recommendations regarding breed, age, etc for certain parameters
- 28 primary care veterinary clinics participated
- Any dog or cat that was assessed as clinically healthy by both the owner and veterinarian

MOVEH Study

- 1421 dogs/277 cats, equal males and females
- Signalment and 16 biochemical and hematological parameters
- 125 dog breeds, dogs were 0.3 to 16 years of age (mean of 6.1 years)
- Mainly domestic cats, 8% exotic breeds (12 different breeds), cats were 0.3 to 19 years of age (mean of 7.8 years).

Canine data

- 39.5% had abnormalities present
- Majority of dogs with abnormalities > 5 years old

Biochemistry	Complete blood count
↓ albumin	↓ or ↑ hematocrit
↑ globulins	↓ or ↑ platelet count
↑ ALT and/or ALP	↓ or ↑ neutrophils
↑ urea and/or creatinine	↑ lymphocytes
↑ glucose	
↓ potassium	
↓ or ↑ calcium	

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Individual breeds

- Jack Russell Terriers were more likely to have elevated creatinine or hypoalbuminemia
- Shih Tzus were more likely to have elevated ALP or urea
- German Shepherd Dogs were more likely to have an elevated creatinine

Feline data

- 65.7% had abnormalities present

Biochemistry	Complete blood count
↓ albumin	↓ or ↑ hematocrit
↑ globulins	↓ or ↑ platelet count
↑ ALT and/or ALP	↓ or ↑ neutrophils
↑ urea and/or creatinine	↓ or ↑ lymphocytes
↑ glucose	
↑ or ↓ potassium	Endocrinology
↑ calcium	↑ Total T ₄

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Relation of age

- 75% of patients with an elevation in one or both serum renal parameters were 11 years or older
- All patients with an elevated serum TT4 concentration were 14 years or older
- Need to remember that this is in **ASYMPTOMATIC** patients, not a rule for all patients

Preanesthetic testing

- Routine in some practices
- “Upgrade” in other practices
 - Relies on effective client education to explain benefits
- But are there proven benefits??

Preanesthetic testing

- Only a few small studies that evaluate preanesthetic screening
 1. “preoperative laboratory assessment was of minimal value and did not modify the established anesthetic plan”
 2. 13.0% of study participants had the anesthetic procedure cancelled. Nearly 30% of geriatric patients had suggestion of subclinical disease

Preanesthetic testing

- 2018 CVJ study
 1. Wide variability between anesthesiologists
 2. 'Pre-anesthetic laboratory screening test results may influence pre-operative anesthesia case management but major discrepancies can occur among ACVAA diplomates.'

Preanesthetic testing

- Recent study evaluating the risk of anesthetic mortality in cats and dogs
 1. Age did not predict anesthetic death
 2. “Efforts must be directed towards thorough preoperative patient evaluation and improvement of clinical conditions if possible”

AAHA Anesthesia Guidelines

- Individual practice procedures may include a minimum database of laboratory analysis, electrocardiogram, and diagnostic imaging for different patient groups. The type and timing of such testing is determined by the veterinarian based on factors (Hx, PE, signalment, temperament, type of procedure), as well as any change in patient status or the presence of concurrent disease.

Ways to navigate current data

- The cornerstone to implementing an effective preventive medicine program is a team approach to client communication
- This should include proper training of all members of the veterinary staff
- Once available, the AAHA Canine Lifestages Guidelines can be used to devise a plan for dogs. Other guidelines also exist to help guide you.

Veterinary Visit: Dogs

AAHA/AVMA Guidelines: Dogs

- All dogs should have a veterinary exam at least annually
 - History, physical examination, heartworm & other internal parasite testing
 - Consider early disease screening tests
 - base on age and breed
 - Parasite control; consider tick control
 - Dental, behavioural, dietary recommendations

Veterinary Visit: Dogs

- All dogs should have a veterinary exam at least annually
 - Vaccinations as indicated; discuss core and non-core
 - Discussion of zoonotic disease, prevention
 - Spay/neuter/microchip counselling
 - Establish a plan for the next visit, set expectations
 - Thorough documentation of the visit
- Your clinic staff should ALL be involved in this visit. Utilize champions within your team for specific areas.

Veterinary Visit: Cats

AAHA/AVMA Guidelines: Cats

- All cats should have a veterinary exam at least annually
 - History, physical examination, heartworm testing, retroviral testing, internal parasite testing
 - Consider early disease screening tests
 - base on age and breed
 - Parasite control; consider tick control (outdoor cats)
 - Dental, behavioural, environmental enrichment, dietary recommendations

Veterinary Visit: Cats

- All cats should have a veterinary exam at least annually
 - Vaccinations; discuss core and non-core
 - Discussion of zoonotic disease, prevention
 - Spay/neuter/microchip counselling
 - Establish a plan for the next visit, set expectations
 - Thorough documentation of the visit
- Your clinic staff should ALL be involved in this visit. Utilize champions within your team for specific areas.

Minimum database

- Minimum database testing should be discussed at each visit (excluding kitten/puppy visits).
- Preanesthetic laboratory testing should be offered and discussed for every patient requiring general anesthesia and sedation.
- Ideal to get “baselines” when pets are younger.
- Start yearly testing at middle age if not earlier.
- Will have to base this on breed to determine age.

Breed specific considerations

- Consider earlier testing for certain breeds
 - ALT in young Labrador Retrievers, Dobermans, Great Dane, Springer Spaniel, etc
 - ALT and potentially bile acids in juvenile Yorkshire Terriers, Pugs, Maltese, etc
 - Fasting triglyceride and ALT in Miniature Schnauzers
 - Albumin in Norwegian Lundehund, Wheaton Terriers, etc
 - Renal parameters in younger Persian and Abyssinian cats

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Age specific considerations

- PCV and mini chemistry only in young animals?
- Renal profile (urea, creatinine, phosphorus, potassium, urinalysis) in mature adults and seniors, by 11 years of age at the oldest in cats
- Renal profile and urinalysis before NSAID use
- Total T₄ by 14 years of age at the oldest in cats
- Etc...

Minimum database: Dogs

- Puppy (weaning to 6-9 months) – fecal testing, discuss recommendations for pre-anesthetic screening
- Young adult (up to 3-4 years) - CBC/mini biochem/UA, heartworm testing, fecal testing, tick testing if indicated
- Mature adult (up to last 25% of life) - CBC/biochem/electrolytes/UA, heartworm testing, fecal testing, tick testing if indicated
- Senior (last 25% of life) - CBC/biochem/electrolytes/UA, heartworm testing, fecal testing, tick testing if indicated; increase the frequency of testing to q6mos

Minimum database: Cats

- Kitten (weaning to 6 months) – fecal testing, viral testing if indicated, discuss recommendations for pre-anesthetic screening
- Young adult (up to 5-6 years) - CBC/mini biochem/UA, viral screening, fecal testing, tick testing if indicated
- Mature adult (up to last 25% of life) - CBC/biochem/electrolytes/UA, fecal testing, blood pressure, +/- TT₄, viral and tick testing if indicated
- Senior (last 25% of life) - CBC/biochem/electrolytes/UA, fecal testing, blood pressure, TT₄, viral and tick testing if indicated

The Importance of a UA

- Required if azotemia noted to determine cause
- May reveal inability to concentrate urine, proteinuria, urolithiasis, urinary tract infection
- Requires planning and owner counselling
- Come to appointment with free flow sample
- Get owner to obtain free flow sample at appointment for dogs
- Consider cystocentesis or sterile urinary catheterization

Minimum database: Imaging

- Minimal studies at this time (abdominal ultrasound, thoracic radiographs)
- Controversial in human medicine
- Not enough data to support routine use at this time
- May be breed specific indications for U/S, radiographs, ECG, echocardiography
 - Echocardiography in Dobermans

Preventive Medicine Visit

- The annual history and physical examination allows the physical / external / historic health of a pet to be assessed
- The annual minimum database allows the internal health of a pet to be assessed
- These are complimentary
 - A significant percent of healthy animals have occult disease that can be revealed through an annual preventive medicine visit

Successful Implementation

- All personnel should be educated as to the importance of preventive medicine
- Clinic-wide guidelines should be distributed, so that all staff are able to counsel owners
- All staff should be prepared to answer WHY preventive medicine is important
- They should also be able to explain the basics of an recommended testing

Preventive Medicine Visit

To reinforce the value of preventive medicine:

- Review results of lab work
- Have prepared hand outs for abnormalities found on lab work, and common disease processes
 - There are many of these prepared for clients on VIN, Ettinger textbook, etc.
- Stress the value of normal results, by having an on-going baseline, and the fact that normal results are good news

Bottom Line

It all comes down to client education and communication:

- Involve all members of your veterinary team
- Involve more than one method of communication
 - Verbal
 - Written literature / Reminders
 - Website
- Set expectations early (puppy or kitten exams)
 - And manage these expectations

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Questions?

