Undetected pain & subsequent behavior problems: Detection (Part 1)

Kat Pankratz, DVM DACVB

November 5, 2022

2022 SBCV Fall Conference & Trade Show

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myVETgroup

Disclaimer

No association with any product shared

Recommendations should not be taken as an exclusive protocol as variations in practice may be warranted

Speaker's perspective is from the United States

Lecture Goals

- Understanding the importance of pain
- Pain: Physical vs Behavioral
  - Differentials by organ systems
- Considerations when gathering information
- Pain detection tools for detection

Why should we care about pain?

Veterinarian's oath

Being admitted to the profession of veterinary medicine, I solemnly swear to use my scientific knowledge and skills for the benefit of society through the protection of animal health and welfare, ***the prevention and relief of animal suffering,*** *the conservation of animal resources, the promotion of public health, and the advancement of medical knowledge.*

I will practice my profession conscientiously, with dignity, and in keeping with the principles of veterinary medical ethics.

I accept as a lifelong obligation the continual improvement of my professional knowledge and competence.

Preemptive pain management improves quality of life

Post-operative central hypersensitivity and pain: the pre-emptive value of pethidine for ovariohysterectomy

B.D.X. Lascelles[a,b,*], P.J. Cripps[a], A. Jones[a], A.E. Waterman[a]

Efficacy and Kinetics of Carprofen, Administered Preoperatively or Postoperatively, for the Prevention of Pain in Dogs Undergoing Ovariohysterectomy

B. DUNCAN X. LASCELLES, BSc, BVSc, PhD, MRCVS, CertVA, CertSAS, PETER J. CRIPPS, BVSc, PhD, MRCVS,

Proactive is better than reactive

To be proactive needs recognition of when pain is present

Pain (osteoarthritis) is common in dogs (40%) and cats (50%)

OSTEOARTHRITIS

Joint Anatomy, Physiology, and Pathobiology

Spencer A. Johnston, VMD

PVM1

DIAGNOSIS AND TREATMENT RATES OF OSTEOARTHRITIS IN DOGS USING A HEALTH RISK ASSESSMENT(HRA) OR HEALTH QUESTIONAIRRE FOR OSTEOARTHRITIS IN GENERAL VETERINARY PRACTICE

Wright A,[1] Amodie D,[1] Cernicchiaro N,[2] Lascelles B,[3] Pavlock A[4]

[1]Zoetis, Greeley, CO, USA, [2]College of Veterinary Medicine Kansas State

Most 10+ year old cats have osteoarthritis

Cross-Sectional Study of the Prevalence of Radiographic Degenerative Joint Disease in Domesticated Cats

B. Duncan X. Lascelles[1] BVSc, PhD, DSAS(ST), Diplomate ACVS & ECVS, John B. Henry[2] III PhD, James Brown[3] DVM, MS, Diplomate ACVR, Ian Robertson[3] BVSc Diplomate ACVR, Andrea Thomson Sumrell[1] RVT, Wendy Simpson[4] DVM, Simon Wheeler[1,5] BVSc, PhD, Bernie D. Hansen[1] DVM, Diplomate ACVECC & ACVIM, Helia Zamprogno[1] DVM, PhD, Mila Freire[1] DVM, and Anthony Pease[3] DVM, MS, Diplomate ACVR

DJD in cats as young as 6 months

Cross-Sectional Study of the Prevalence of Radiographic Degenerative Joint Disease in Domesticated Cats

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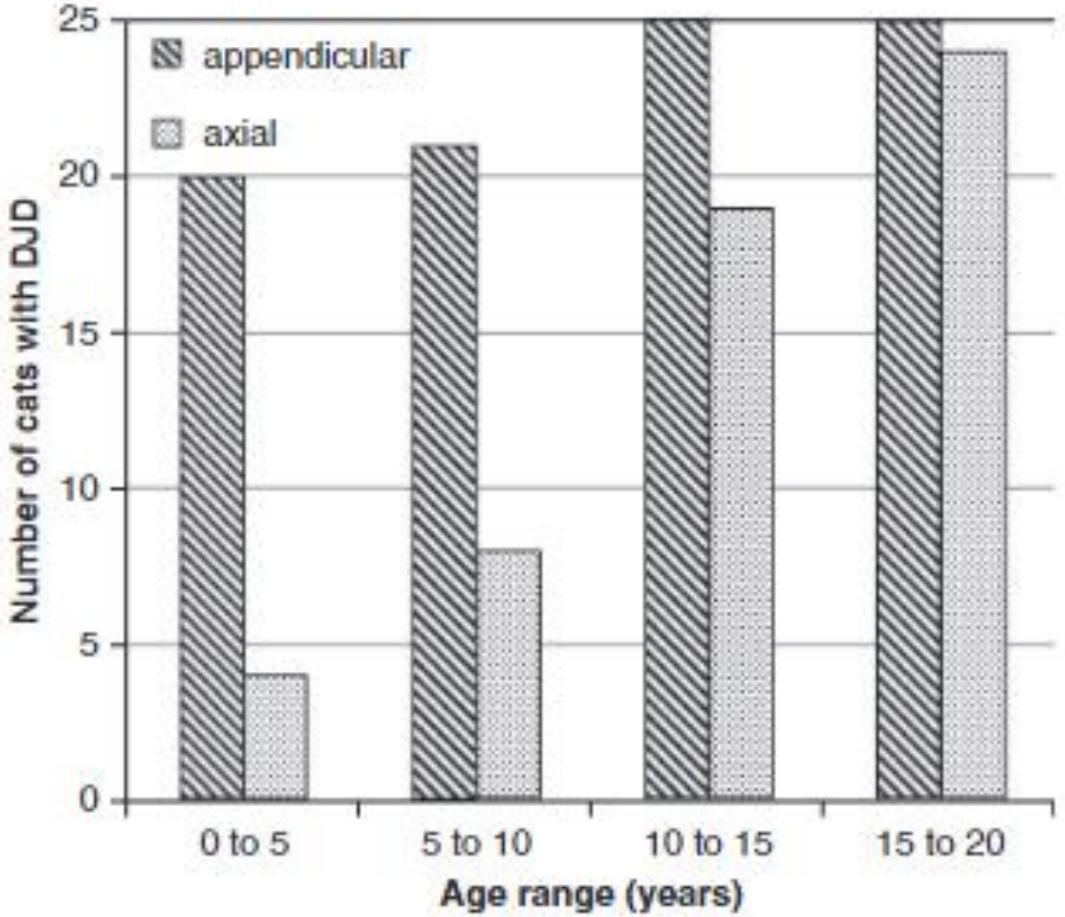


Some breeds are more prone to developing painful conditions

DogTime

DogTime

Some breed conformation prone to development of pain

- When "normal" is actually abnormal can lead clinicians to overlook pain due to breed

Akc.org

OPEN ACCESS

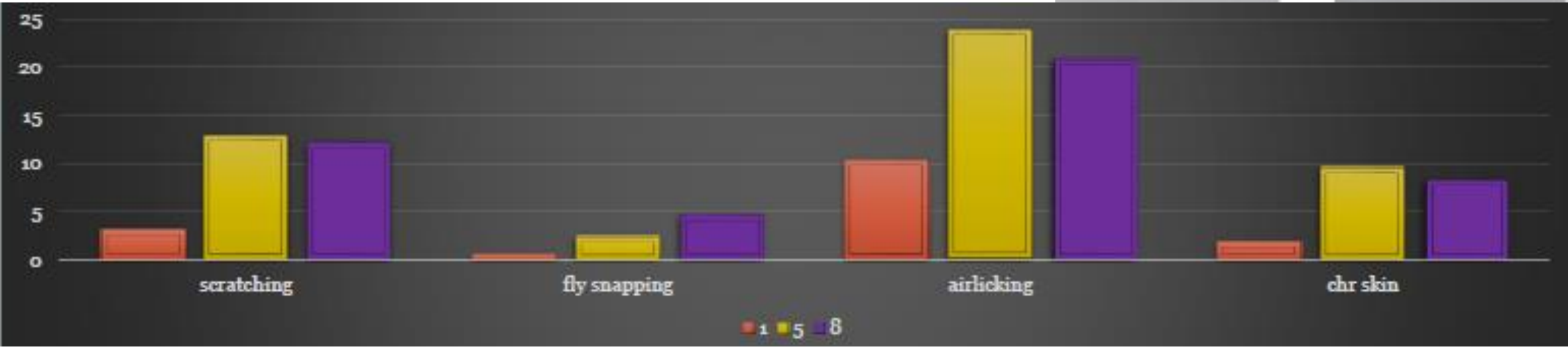
PAPER

High prevalence of gait abnormalities in pugs

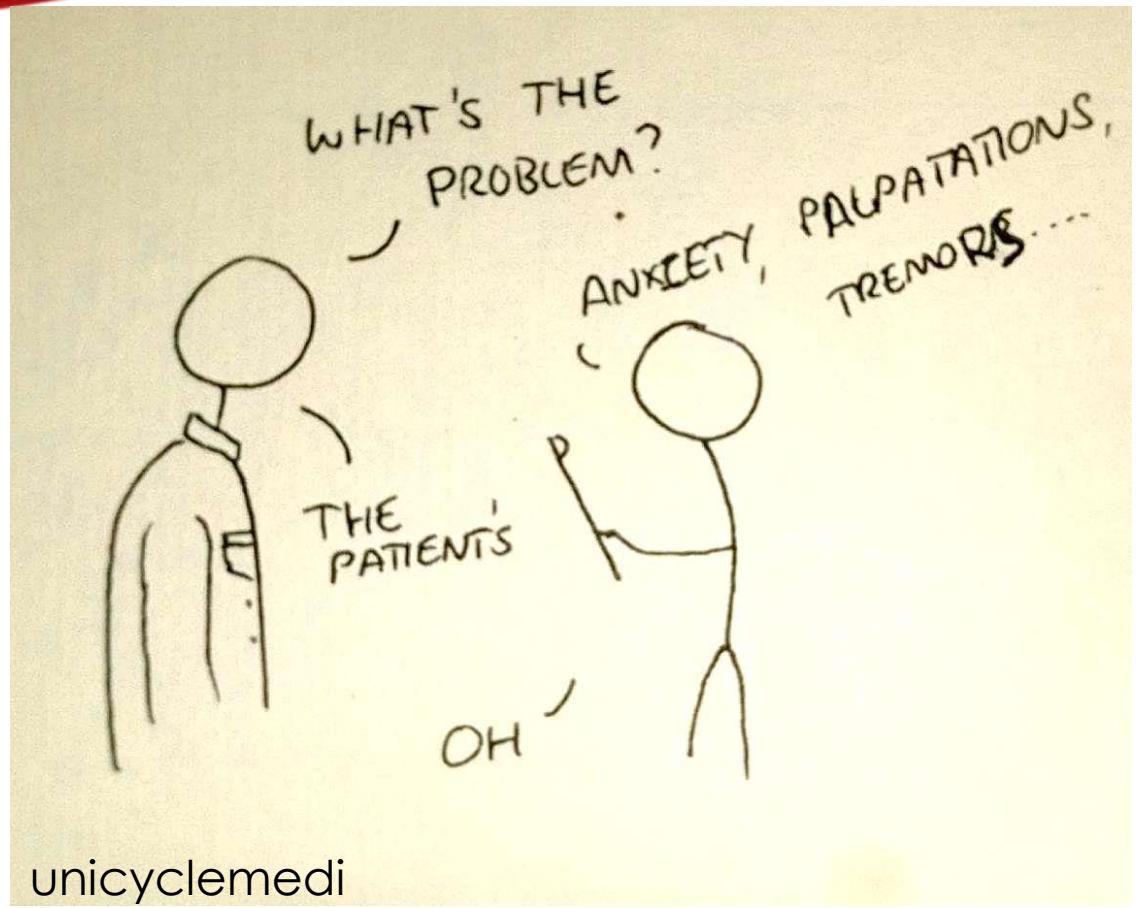
Cecilia Rohdin,[1,2] Karin Hultin Jäderlund,[3] Ingrid Ljungvall,[1] Kerstin Lindblad-Toh,[4,5] Jens Häggström[1]

- Abnormal sitting posture
- Overt pain
- Unable to jump up

- Air licking
- Fly snapping
- Abnormal scratching



What does this have to do with behavior?



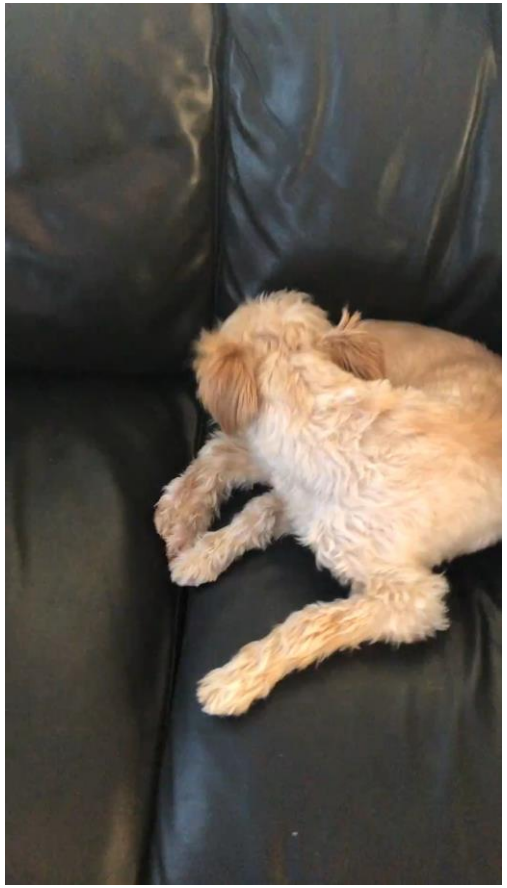
Presenting complaint is behavioral description

Physical vs mental (or both)

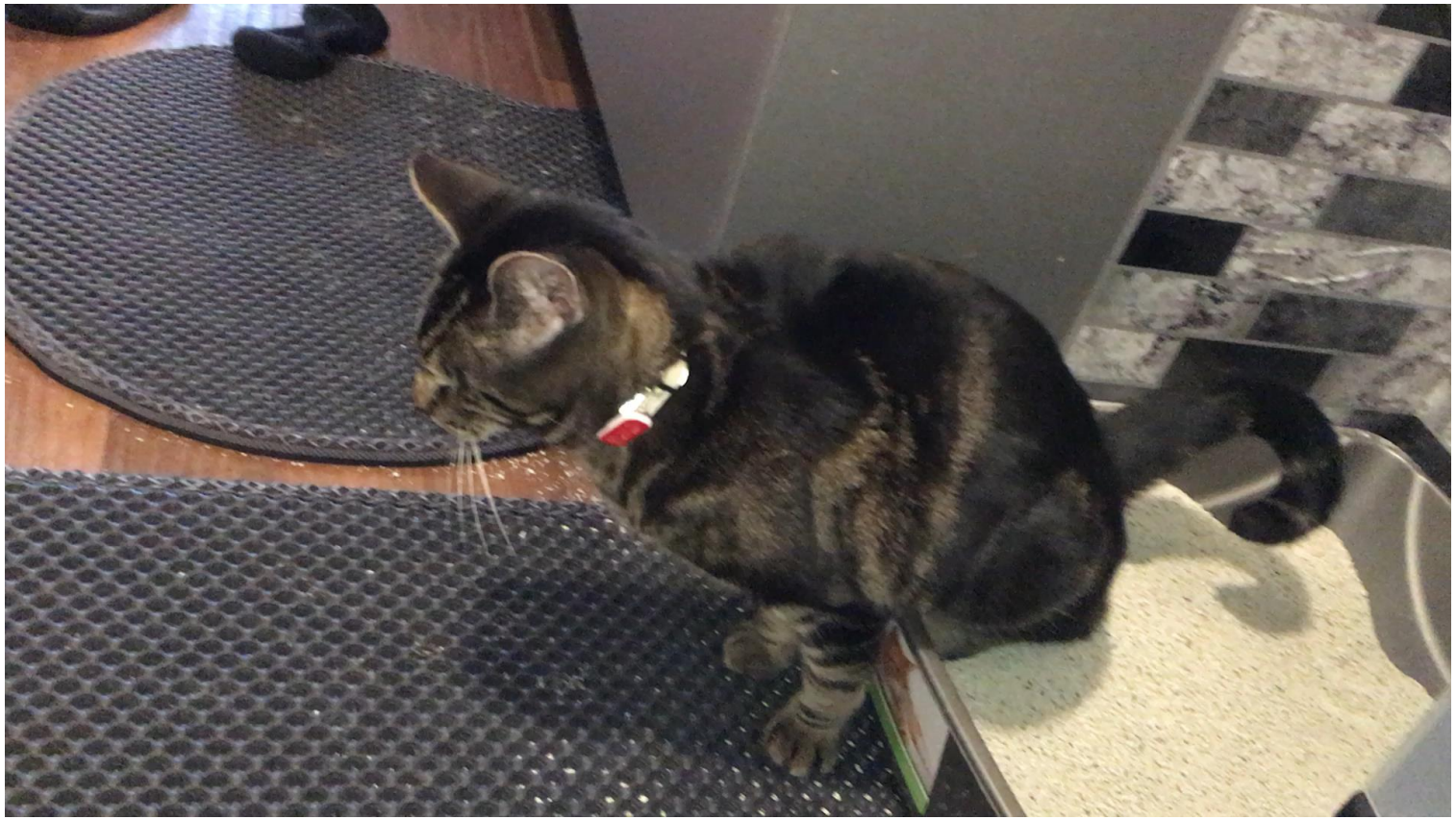
Relationship between pain and problem behavior

- Pain as the primary cause of the behavior
- Pain exacerbates the concurrent primary behavior cause
- Behavior condition exacerbates underlying pain condition

Example of mix of pain with behavior concern



Pain can evolve into a behavior problem



Pain & behavior signs are nonspecific & overlap

Signs of anxiety and fear include:

- Avoidance, hiding
- Pant, salivate, lip licking, swallowing, lip smacking,
- Visual scanning, dilated pupils
- Vocalization
- Elimination
- Lower posture (ears flat, tail low, head low)
- Seeking human or pets
- Anorexia
- Pacing, restless
- Digging, chewing
- Trembling
- Reduced maintenance behaviors
- Defensive aggression

Casey, 2002; Beerda et al. 1997 & 1998; Schwizgebel et al 1982; Hetts et al 1992;

Nonspecific signs could have physical condition

- Nausea
  - **Lip licking, swallowing, smacking**

Companion Animal Psychology

Tams, 2003; Dards, 1983; Baral, 2012

Nonspecific signs could have physical condition

- Neurological disorder
  - (vs fever vs tremors) = **Trembling** (Miller, 2010; Thomas, 2010)
  - (vs pain vs hyperthyroidism) = **Restless** (Fingeroth et al 1987; Bagley et al 1999; Baral & Peterson, 2012)
  - (vs pain) = **Aggression** (Bagley et al 1999)

Nonspecific signs could have physical condition

- Pain
  - **Vocalization**

Nonspecific signs could have physical condition

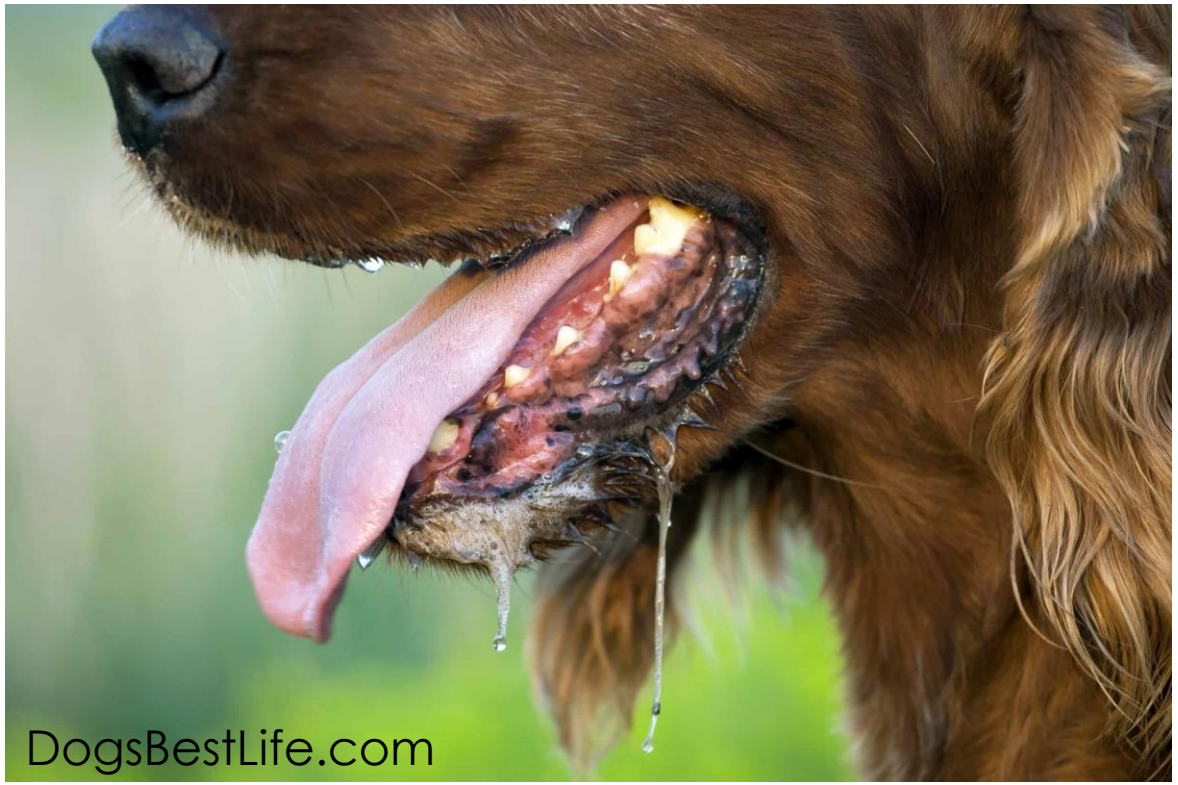
- Gastrointestinal disorder
  - **Destructive chewing**

(King et al 2000; McCrave, 1991)

Nonspecific signs could have physical condition

- Cardiovascular
  - (vs metabolic disease vs pain) = **Panting**

(Baral & Peterson, 2012; Melian et al 2010; Forney, 2010; Quimby et al 2003; McKune & Robertson, 2012)



Keep species specific behaviors in mind

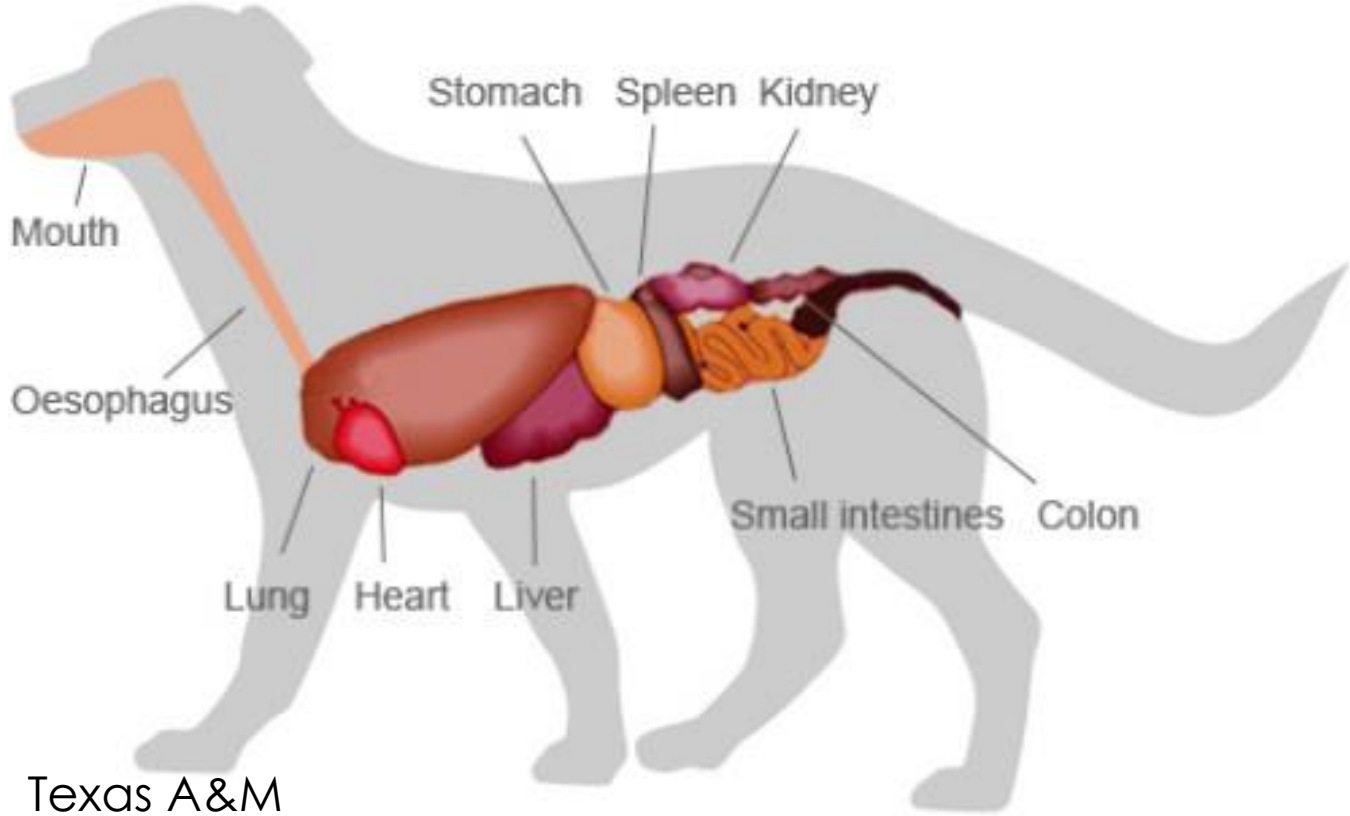
Cats are predators & prey with need to hide pain & ability to escape

Animal Wised

Dogs change their behavior to avoid pain

Categorization of pain differentials

- Neurologic
- Urogenital
- Gastrointestinal
- Dermatologic
- Endocrinologic
- Orthopedic



Texas A&M

Neurologic

Behavior changes can occur months prior to neurological detection

- Slower to learn
  - ie house soiling / training
- Loss of learned behavior
- Stereotypical behavior
- Apprehension
- Aggression

The Textbook of Veterinary Internal Medicine: Diseases of the Dog and Cat Volumes I and II
Edited by S. J. Ettinger. Philadelphia: W. B. Saunders/London: Harcourt Brace Jovanovich. 1989. 3rd edition. 2400 pp. (2×1200). £110.00 (£55.00 each)

Case Reports › J Am Vet Med Assoc. 1976 Aug 15;169(4):405-10.

Lissencephaly in two Lhasa Apso dogs

C E Greene, M Vandevelde, K Braund

Review

J Vet Intern Med 2002;16:133–141

Recognition and Diagnosis of Lysosomal Storage Diseases in the Cat and Dog

Barbara J. Skelly and Robin J.M. Franklin

Neuropathic pain can manifest in variety of behaviors

- Scratching motion without touching
- Biting self
- Frequently looking at same area
- Vocalization

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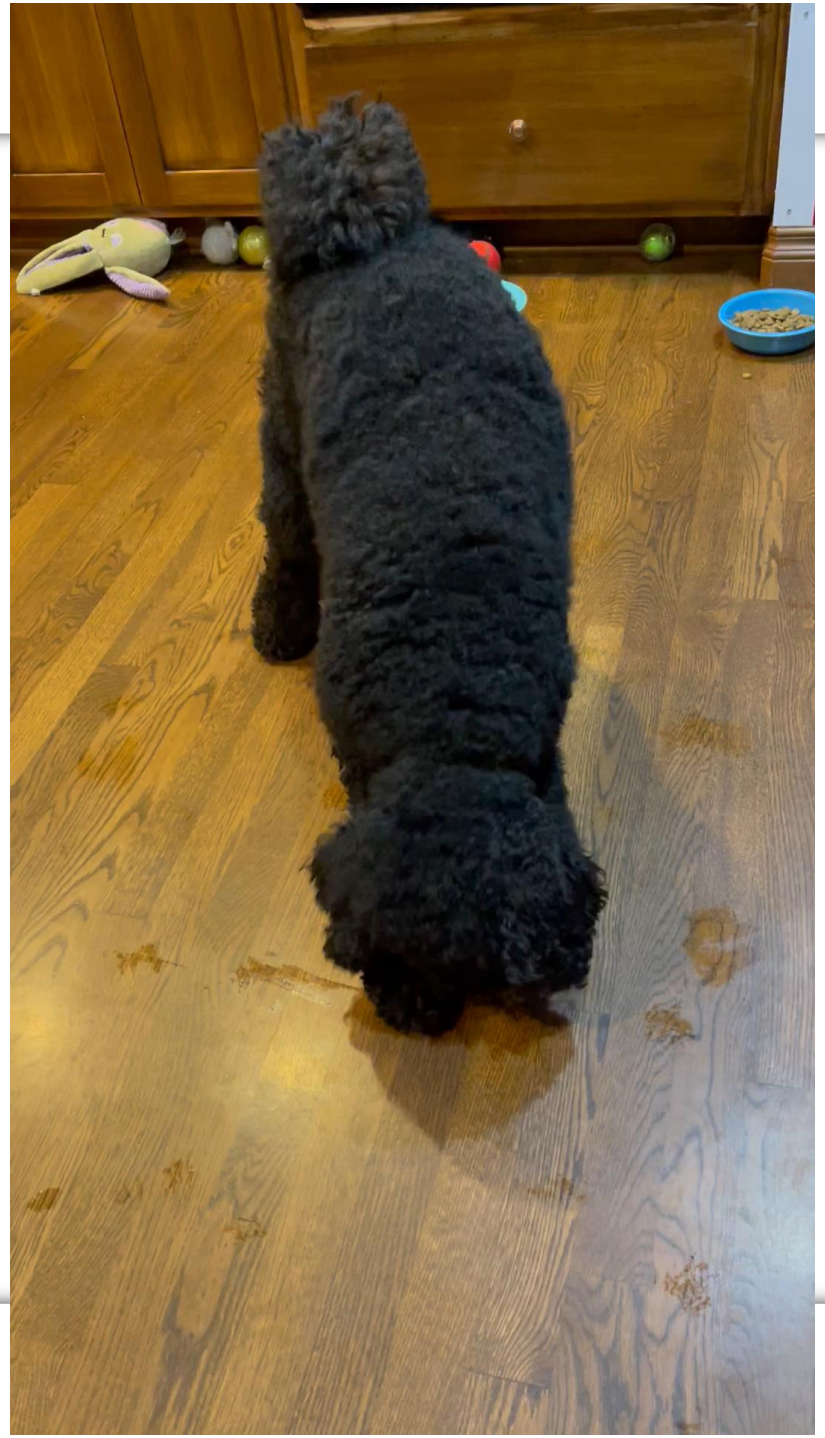
Veterinary Clinics of North America: Small Animal Practice

Volume 38, Issue 6, November 2008, Pages 1365-1414

Neuropathic Pain in Dogs and Cats: If Only They Could Tell Us If They Hurt

Karol A. Mathews DVM, DVSc ✉



Repetitive behaviors associated with neuropathic pain

Self mutilation associated with neuropathic pain

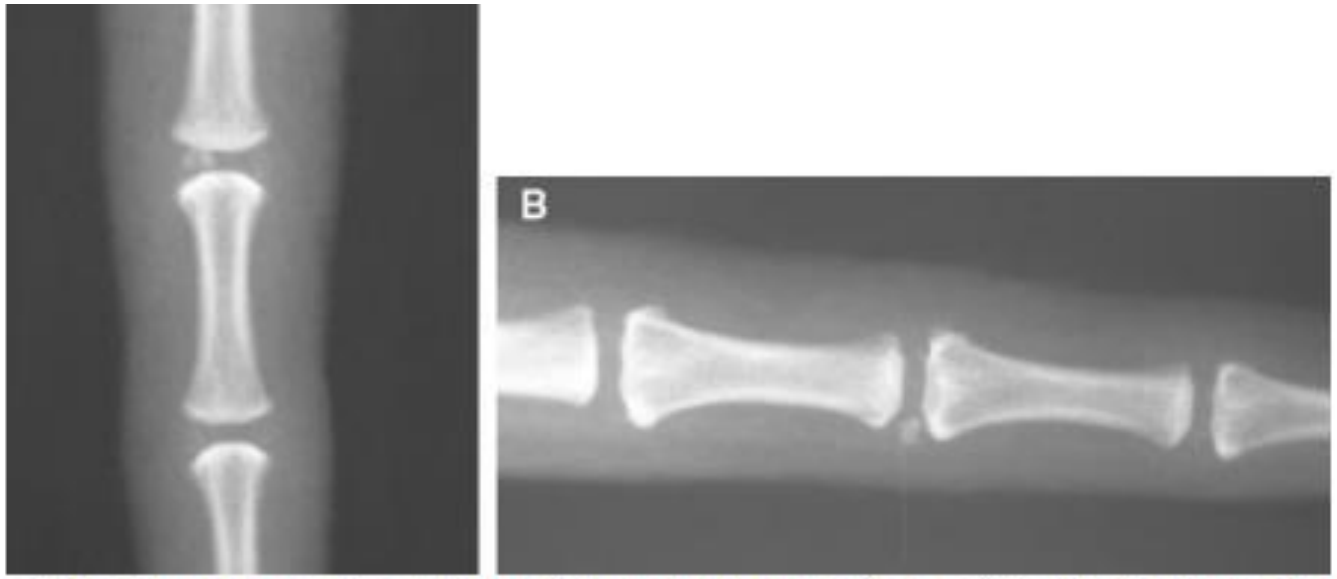


Figure 3 Close-up of the radiographs shown in Figure 2 to show the mineralized ossicle; (A) Ventrodorsal and

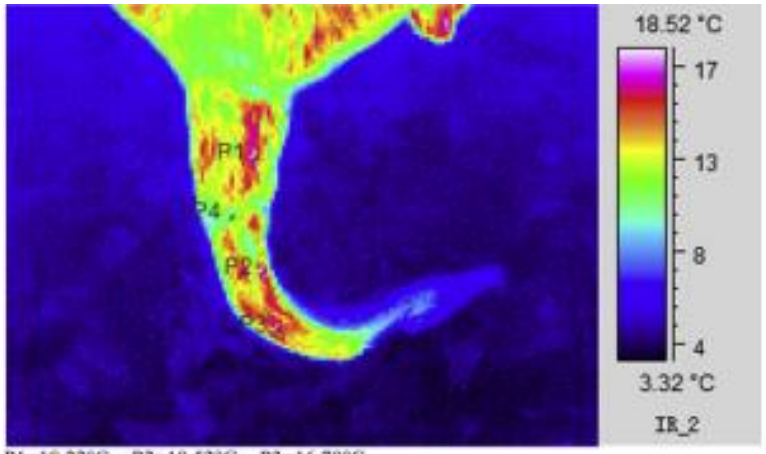
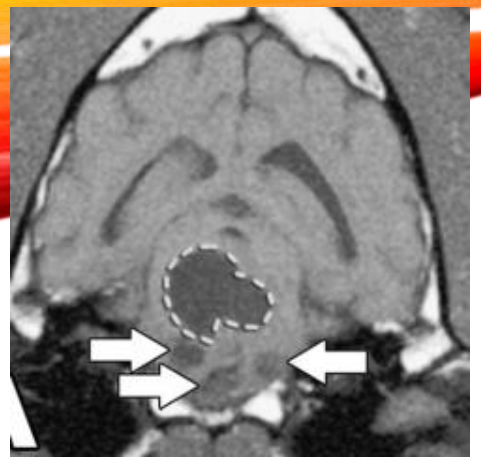


Figure 1 Dorsal thermogram of hindquarters and tail. (A color figure can be found in the online version of this article.)

CASE REPORT

The use of tramadol in a Labrador retriever presenting with self-mutilation of the tail

Helen E. Zulch[a], Daniel S. Mills[a], Ruth Lambert[a], Robert M. Kirberger[b]



J Vet Intern Med 2003;17:357–359

Simultaneously Occurring Oligodendroglioma and Meningioma in a Dog

B.A. Stacy, T.L. Stevenson, D. Lipsitz, and R.J. Higgins

Clinical and MRI Findings in Three Dogs with Polycystic Meningiomas

Fiona M. K. James, MSc, DVM, DVSc, DACVIM (Neurology), Ronaldo C. da Costa, PhD, DVM, DACVIM (Neurology)*, Amy Fauber, MS, DVM, DACVS, Andrew S. Peregrine, PhD, DVM, DEVPC, Beverly McEwen, PhD, DVM, DACVP,

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Molecular Genetics and Metabolism

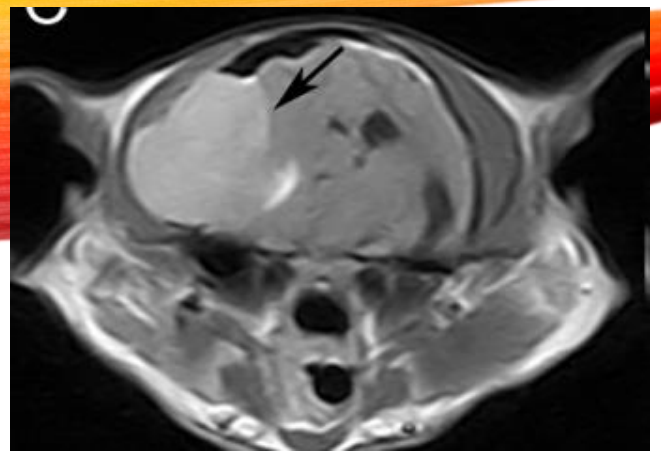
journal homepage: www.elsevier.com/locate/ymgme

A mutation in canine *PPT1* causes early onset neuronal ceroid lipofuscinosis in a Dachshund

Douglas N. Sanders [a], Fabiana H. Farias [b], Gary S. Johnson [b], Vivian Chiang [c], James R. Cook [d], Dennis P. O'Brien [e], Sandra L. Hofmann [f], Jui-Yun Lu [f], Martin L. Katz [a,b,*]

Central neuronal deficits

- Circling / Pacing
- Changes in habits
  - Lack of recognition
  - House soiling
- Anxiety
- Aggression
- Stumbling
- Standing in corners



Behavioral signs of CNS diseases months before diagnosis

- "Just not being themselves"
- Reluctance to play
- Aggression
- Depressed
- Vocalization
- Urinary incontinence
- Constipation
- Self mutilation

Veterinary Ophthalmology (2011) **14**, Supplement 1, 93–98 DOI:10.1111/j.1463-5

CASE REPORT

Intracranial meningioma causing partial amaurosis in a cat

Frédéric Goulle,* Frédéric Meige,* Franck Durieux,* Christophe Malet,* Olivier Toulza,* Pierre-François Isard,† Robert L. Peiffer‡ and Thomas Dulaurent†

Extracranial expansion of a feline meningioma

Philemon Karli[1], Daniela Gorgas[2], Anna Oevermann[3], and Franck Forterre[4]

Feline Leukemia Virus-associated Myelopathy in Cats

K. P. Carmichael[1], D. Bienzle[2], and J. J. Mcdonnell[3]

J Vet Intern Med 1998;12:365–368

Clinical and Clinicopathologic Features in 11 Cats with *Cuterebra* Larvae Myiasis of the Central Nervous System

Eric N. Glass, Angelyn M. Cornetta, Alexander deLahunta, Sharon A. Center, and Marc Kent

Case: 9 yo, MC, Jack Russell Terrier

Presented for “cognitive dysfunction;” treated with selegiline without effect

MRI
DX: Pituitary Brain Tumor

Referred to Neurology Service. Successfully treated with radiation therapy.

Urogenital

Most common sign of urogenital disease is house soiling

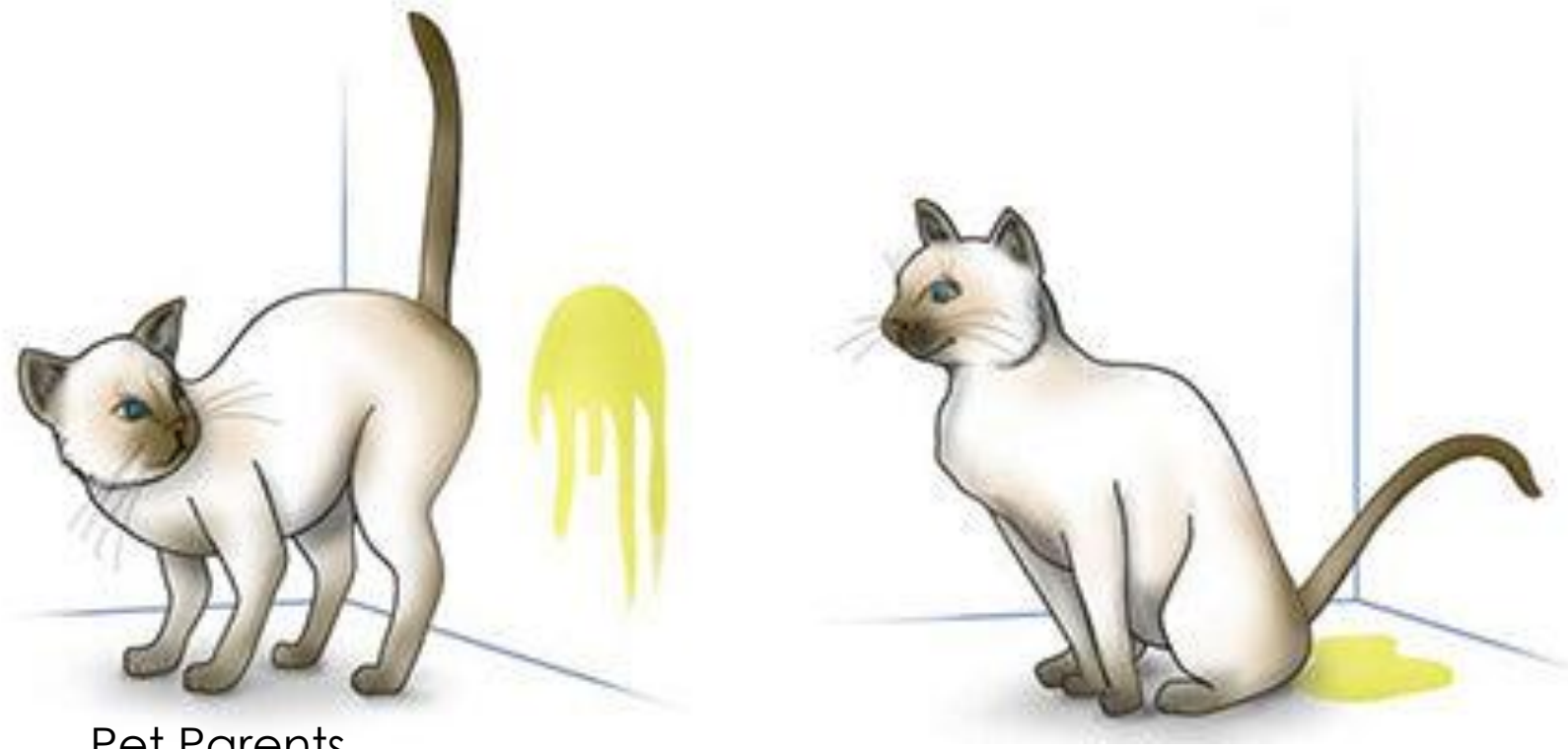
Necessary diagnostics for house soiling

- UA
- Imaging
  - AXR / AUS
  - contrast urethrocystography
- Especially in recurrent episodes and older cats
  - Thyroxine
  - FeLV/FIV testing

Evaluation of the role of lower urinary tract disease in cats with urine-marking behavior

Valarie V. Tynes DVM, Benjamin L. Hart DVM, PhD, DACVB,

Environmental history provides vital clues

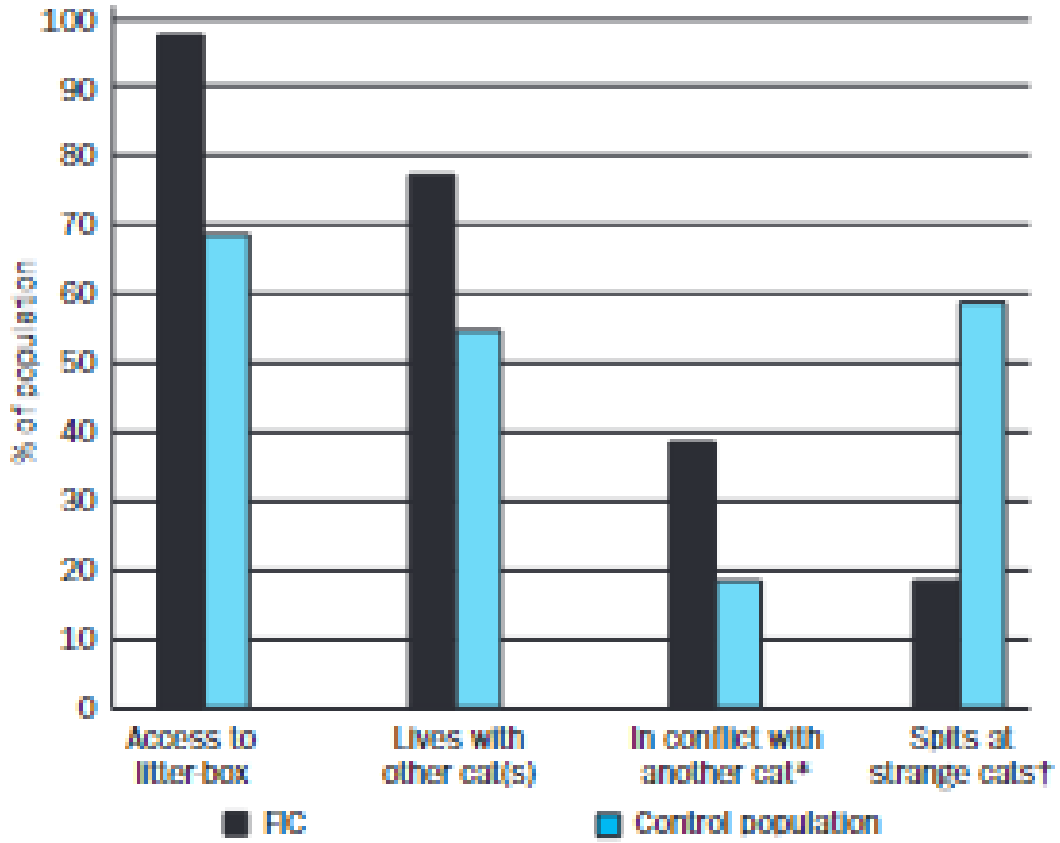


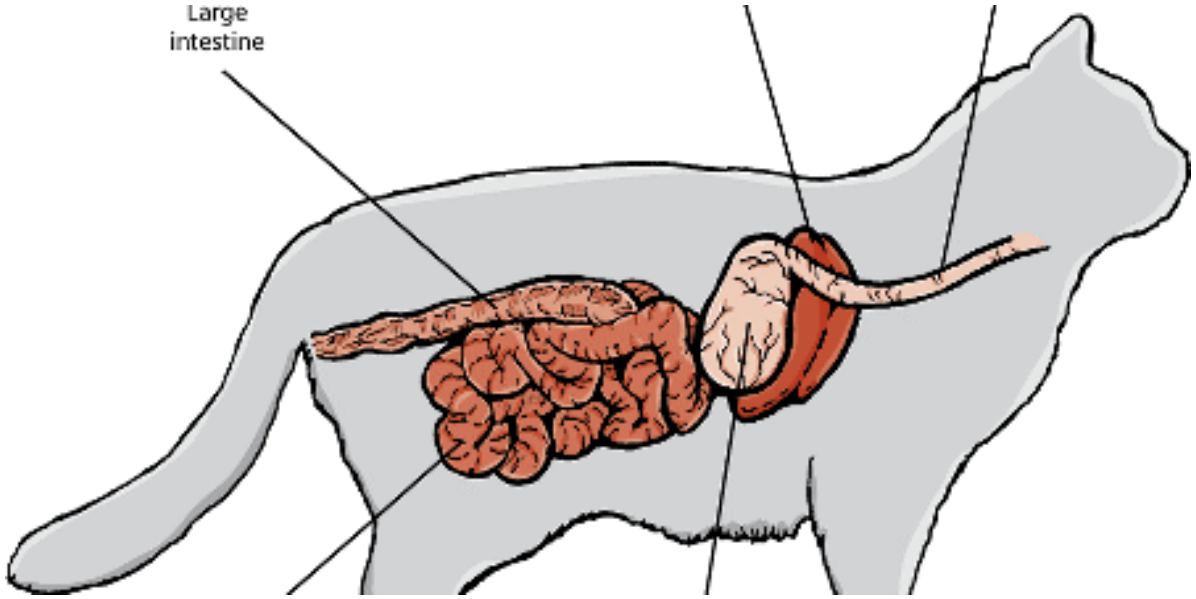
Pet Parents

Feline Interstitial Cystitis associated with neuropathic pain & environment

A study of environmental and behavioural factors that may be associated with feline idiopathic cystitis

M. E. Cameron, R. A. Casey*,
J. W. S. Bradshaw*, N. K. Warant†





Gastrointestinal

Many signs along the GI tract

Esophageal

- Regurgitation
- Dysphagia
- Salivation
- Retching
- Gaging
- Swallowing
- Odynophagia

Gastric

- Nausea
- Salivation
- Vomiting
- Hematemesis
- Melena
- Anorexia

Large Bowel

- Dyschezia
- Tenesmus
- Constipation
- Diarrhea

Clients may not recognize certain GI signs

Need to ask owners explicitly as not viewed as abnormal

Changes in elimination behavior sequence can point to pain

- Dyschezia
- Vocalization
- Pacing / running

Repetitive oral behaviors have strong link to gastrointestinal cause

Proud dog mom

Excessive licking surfaces & fly biting respond to GI treatment

Journal of Veterinary Behavior (2012) 7, 194-204

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Journal of Veterinary Behavior
Clinical Applications and Research

RESEARCH

Gastrointestinal disorders in dogs with excessive licking of surfaces

Véronique Bécuwe-Bonnet[a], Marie-Claude Bélanger[a], Diane Frank[a], Joane Parent[a], Pierre Hélie[b]

- 14 of 19 dogs had GI disorders
- When treated
  - 59% resolution
  - 76% significant improvement

- 3 of 5 dogs without GI disorders improved with GI nonspecific treatment / diet

Fly biting / snapping associated with GI disease and respond to treatment

Prospective medical evaluation of 7 dogs presented with fly biting

Diane Frank, Marie C. Bélanger, Véronique Bécuwe-Bonnet, Joane Parent

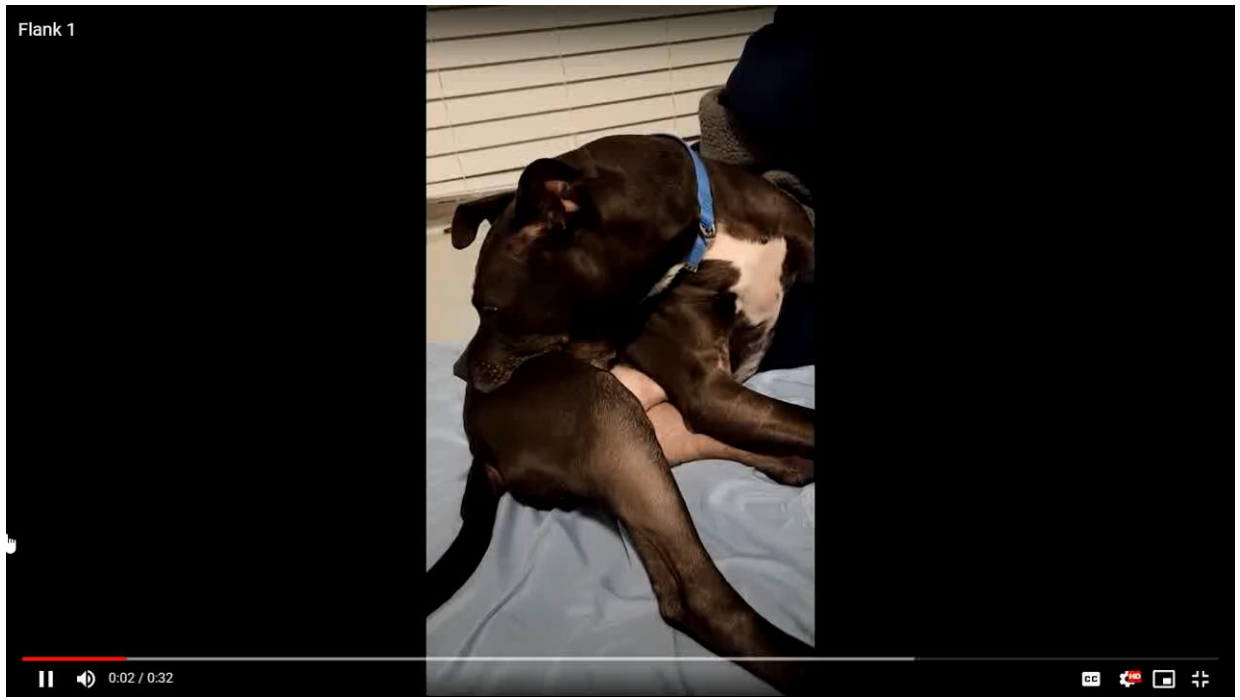
Postanesthetic Esophageal Dysfunction in 13 Dogs

- Extension of neck while swallowing
- 3 of 7 dogs associated with recent feeding
- GI diseases found:
  - Eosinophilic or lymphoplasmacytic infiltration
  - Delayed gastric emptying
  - Reflux
  - Chiari like malformation
- Treatment:
  - Improve/resolution in 6 of 7 dogs (including anxiety signs)
  - 1 unimproved due with noncompliance

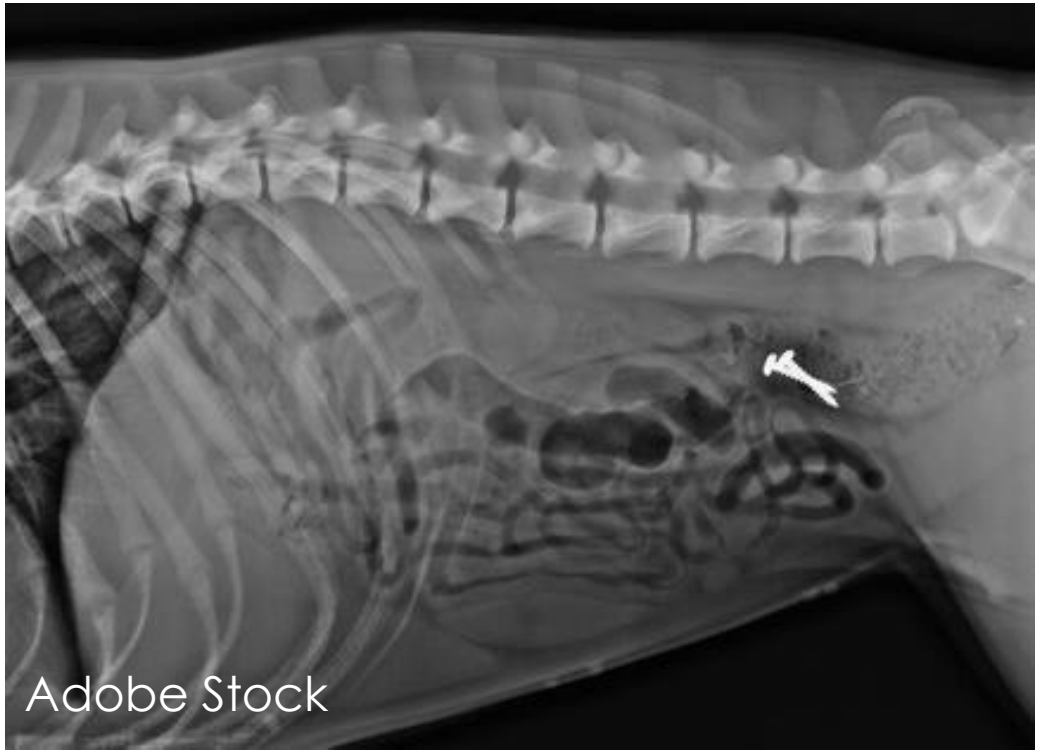
Flank sucking / Blanket sucking associated with pica

Blanket and flank sucking in Doberman Pinschers

Alice A. Moon-Fanelli, PhD; Nicholas H. Dodman, BVMS, DACVB; Nicole Cottam, MS



Pica & foreign body ingestion associated with variety of GI disorders



Take GI biopsies with foreign body removal surgery

Pica has association with many disorders: FIP, gastric, anemia

Neurology Neurologie

Diagnosis and clinical signs of feline infectious peritonitis in the central nervous system

José V. Diaz, Roberto Poma

J Vet Intern Med 1998;12:415–423

Diagnostic Features of Clinical Neurologic Feline Infectious Peritonitis

Janet E. Foley, Jean-Martin Lapointe, Philip Koblik, Amy Poland, and Niels C. Pedersen

Medical and behavioral evaluation of 8 cats presenting with fabric ingestion: An exploratory pilot study

Isabelle Demontigny-Bédard, Marie-Claude Bélanger, Pierre Hélie, Diane Frank

Washabu, Hall. Dysmotility. In: Canine and Feline Gastroenterology

Abrams-Ogg. Nonregenerative anemia. In Textbook of veterinary internal medicine

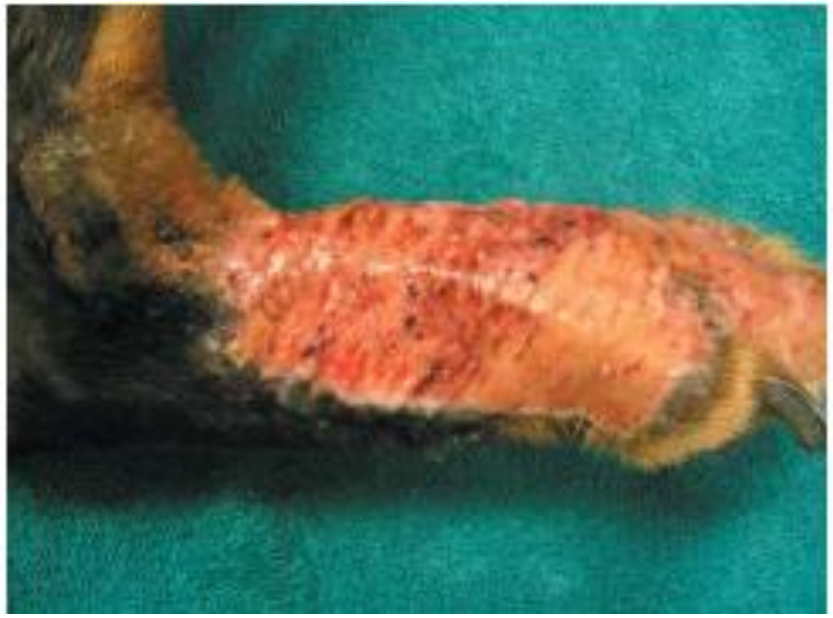
Dermatologic

Acral lick dermatitis differentials

- Atopy
- Food allergy
- Secondary deep pyoderma
- Neoplasia
- Orthopedic
- Infectious disease
- And more

Organic Diseases Mimicking Acral Lick Dermatitis in Six Dogs
Denerolle, et al JAAHA 2007

Acral lick dermatitis associated with entrapped hair, infection & cultures warranted



).1111/j.1365-3164.2008.00693.x

Microbiological and histopathological features of canine acral lick dermatitis

A.K. Shumaker*, J.C. Angust, K.S. Coynert,

positive growth of bacteria differing from superficial

Feline symmetric alopecia associated with primary medical disease (OA)

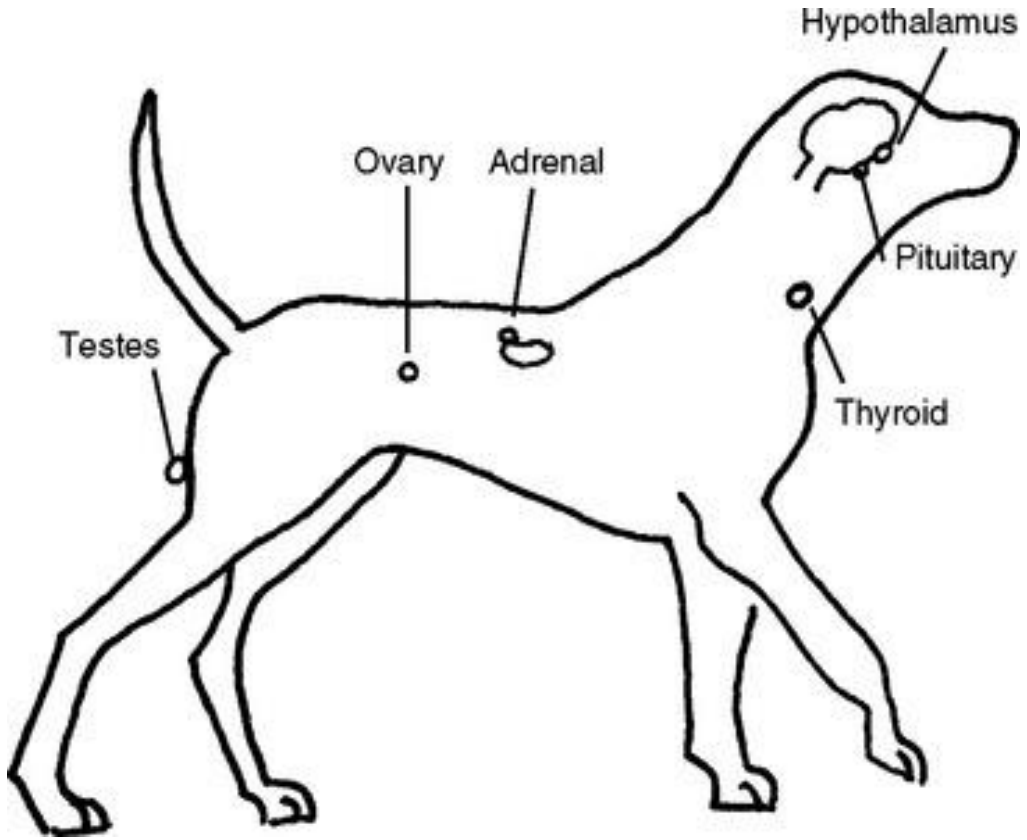
Moriello KA. Dermatology. In: The cat: clinical medicine and management. 2012

Psychogenic alopecia is overdiagnosed

- 21 cats
  - 16 cats: pruritus
  - 3 cats: other medical condition
  - 2 cats: psychogenic alopecia

Underlying medical conditions in cats with presumptive psychogenic alopecia

Stephen E. Waisglass, DVM; Gary M. Landsberg, DVM, DACVB; Julie A. Yager, BVSc, PhD; Jan A. Hall, BVM&S, DACVD



Endocrine

Impact of hypothyroidism with aggression is overrepresented

No strong evidence of aggression with hypothyroidism

- Evaluated CBC, Chem, and thyroid panel
- Only difference: ⇧ thyroxine autoantibodies (wnl) for dogs with aggression

The Veterinary Journal 192 (2012) 472–475

Contents lists available at ScienceDirect

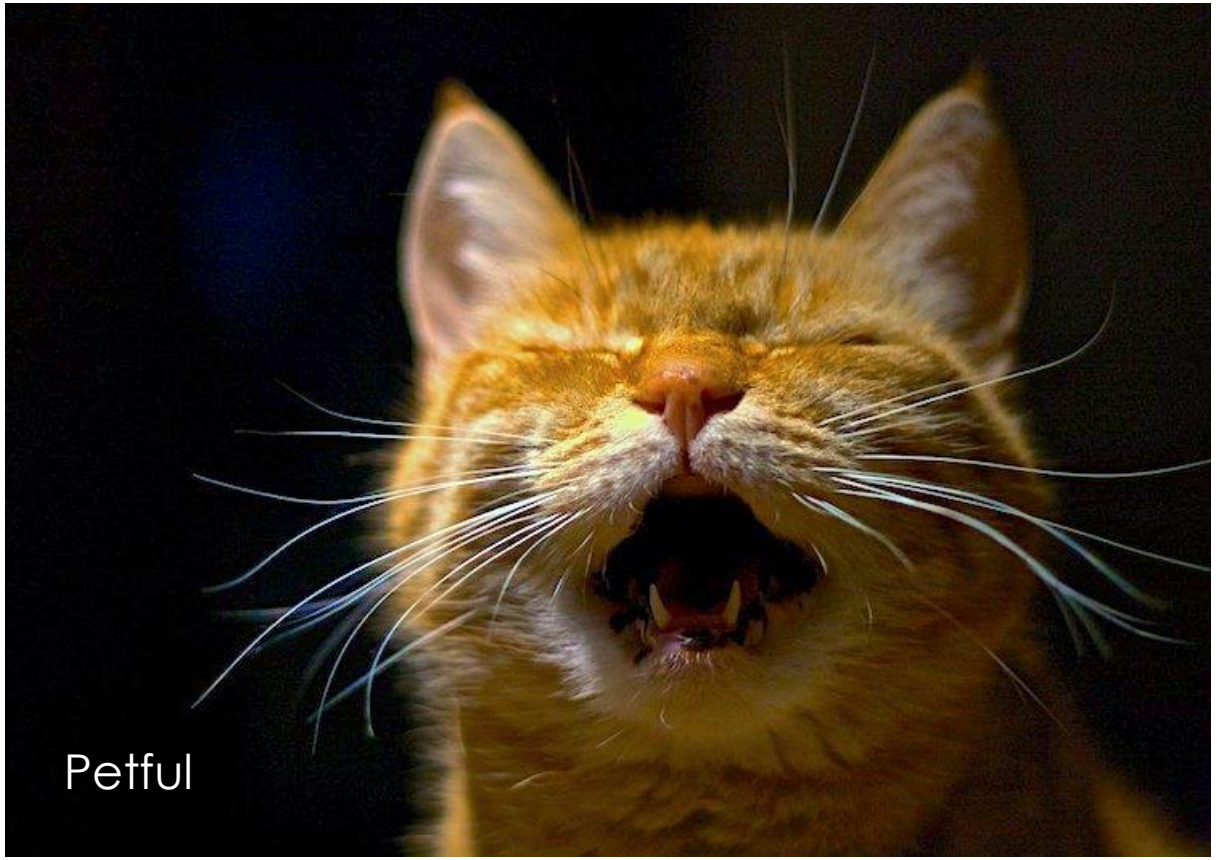
The Veterinary Journal

journal homepage: www.elsevier.com/locate/tvjl

Comparison of thyroid analytes in dogs aggressive to familiar people and in non-aggressive dogs ☆

Lisa A. Radosta [a,*], Frances S. Shofer [b], Ilana R. Reisner [c]

Hyperthyroidism shares similarities with cognitive dysfunction



Increased adrenal activity in cats

- Aggression
- Urine spraying
- Estrus behavior

(all cases aged 12y-15y)

Excessive production of sex hormones in a cat with an adrenocortical tumor

Ralph P. Millard, DVM; Erika H. Pickens, DVM, DACVIM; Katherine L. Wells, DVM

Trilostane treatment of bilateral adrenal enlargement and excessive sex steroid hormone production in a cat

Boag et al. JSAP 2004

Journal of Feline Medicine and Surgery
Volume 13, Issue 6, June 2011, Pages 473-478

https://doi-org.prox.lib.ncsu.edu/10.1016/j.jfms.2011.02.002

Case Report

Cyclic estrous-like behavior in a spayed cat associated with excessive sex-hormone production by an adrenocortical carcinoma

Erika N. Meler, DVM, MS, Dipl ACVIM[1],
J. Catharine Scott-Moncrieff, Vet MB, MS, MA, Dipl ACVIM, Dipl ECVIM[1,*],

Case of house soiling cat with atypical hypoadrenocorticism

Atypical hypoadrenocorticism in a Birman cat

Colleen E. Hock

Can Vet J, 2011

Diabetic Neuropathy cause aversion to touch

Veterinary Clinics of North America: Small Animal Practice
Volume 38, Issue 6, November 2008, Pages 1365-1414

Neuropathic Pain in Dogs and Cats: If Only They Could Tell Us If They Hurt

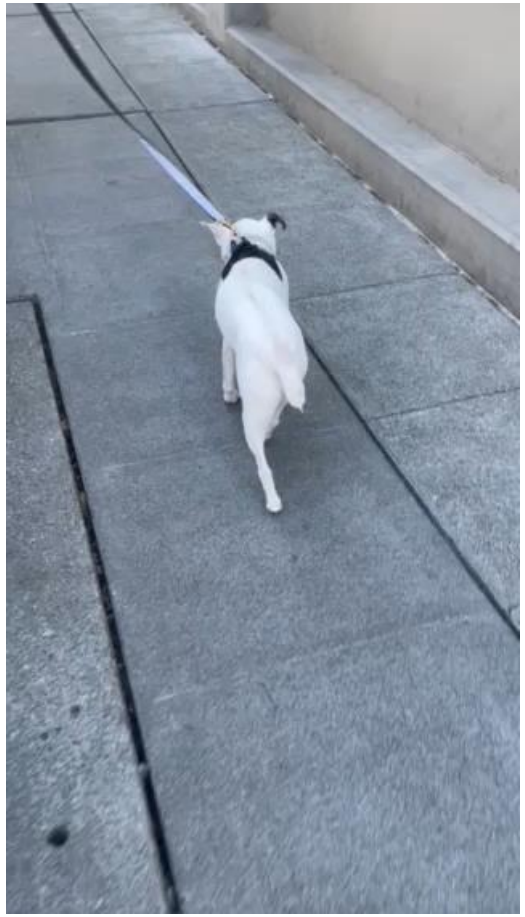
Karol A. Mathews DVM, DVSc ✉

WikiVet

Orthopedic

Osteoarthritis common signs

- Lameness / atrophy
- Loss of normal performance
- Stiffness after rest
- Behavior
  - Nervous
  - Aggression
  - Depression
  - Appetite change
  - Grooming / coat change



Subtle mobile signs in cats & lameness rarely observed

Great Pet Care

ELSEVIER

jfms

A study of owner observed behavioural and lifestyle changes in cats with musculoskeletal disease before and after analgesic therapy

David Bennett BSc, BVetMed, PhD, DVM, DSAO, FHEA, MRCVS[1*],
Carolyn Morton BVMS, MVM, CertVA, MRCVS[2]

Feline osteoarthritis:
a prospective study of 28 cases

Clarke & Bennett, 2006

Owner-perceived signs and veterinary diagnosis in 50 cases of feline osteoarthritis

Mary P. Klinck, Diane Frank, Martin Guillot, Eric Troncy

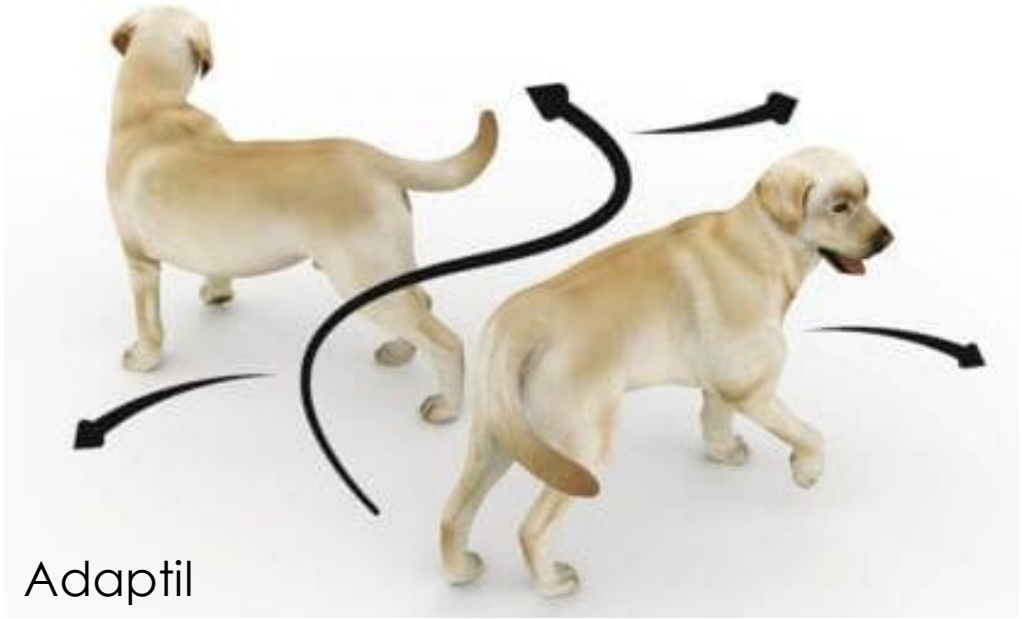
OA leading to litter box changes

New York Times

Owner-perceived signs and veterinary diagnosis in 50 cases of feline osteoarthritis

Mary P. Klinck, Diane Frank, Martin Guillot, Eric Troncy

OA may impact sleep



Adaptil

Initial evaluation of nighttime restlessness in a naturally occurring canine model of osteoarthritis pain

David Knazovicky[1], Andrea Tomas[1], Alison Motsinger-Reif[2,3] and B. Duncan X. Lascelles[1,2,4]

Some features indicative of pain: aggression

General

- Poor temperament
- Aggressive behavior when approached
  - often when the dog is lying down
- Show reluctance to move

Bite features

- Attack less specific targets
- Bites of variable severity
- Bites located on the extremities of target
- Short incidents
- Easy to interrupt

Barcelos, A. M., Mills, D. S., & Zulch, H. (2015). Clinical indicators of occult musculoskeletal pain in aggressive dogs. *Veterinary record*, *176*(18), 465-465.

Some features indicative of pain: noise sensitivity

General

- Older onset
- All associated with loud noises

Behavioral response

- Tendency to hide rather than seek owner
- Strong tendency to avoid location associated with noise

Lopes Fagundes, A. L., Hewison, L., McPeake, K. J., Zulch, H., & Mills, D. S. (2018). Noise sensitivities in dogs: an exploration of signs in dogs with and without musculoskeletal pain using qualitative content analysis. *Frontiers in veterinary science*, *5*, 17.

So how can we get to a diagnosis?

History and information gathering is critical

Client labels can be nonspecific or misleading

Labels

- "goes nuts"
- "looks crazy"
- "spiteful"

False diagnoses

- "separation anxiety"
- "urine spraying"
- "aggressive"
- "anxious"

What do these mean?

We need a clear view of the problem

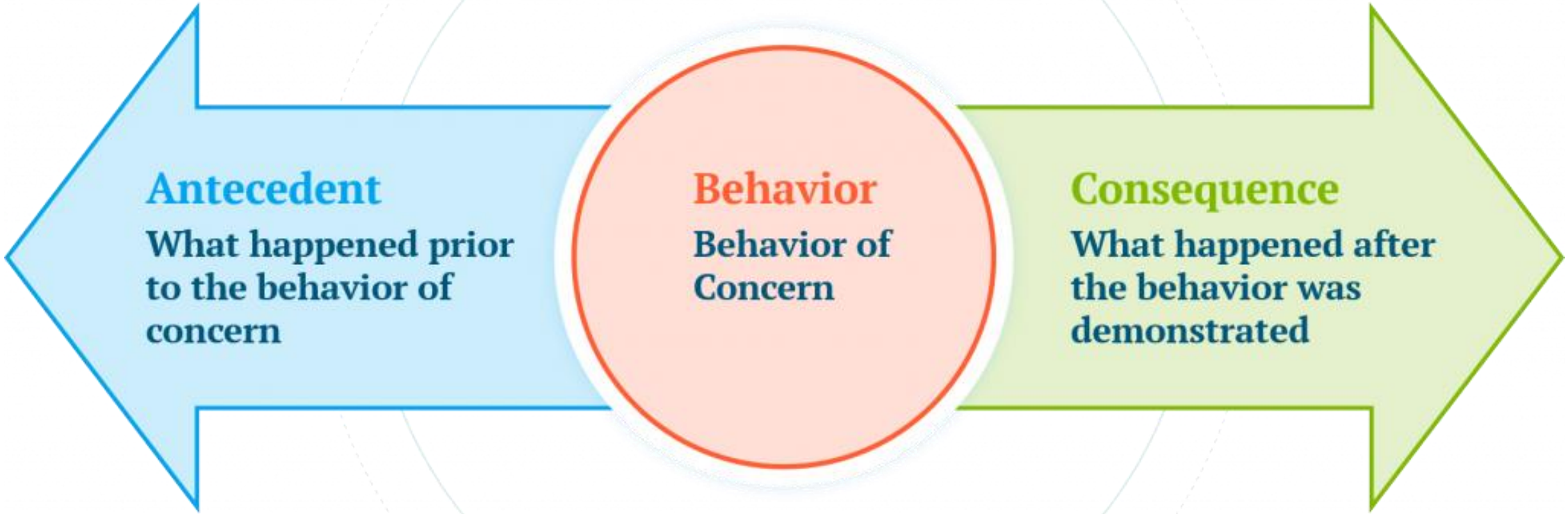
- What exactly is the behavior?
- "Describe it as if it was a movie"
- "What does it look like?"
- When does/did it occur? In response to what?
- Frequency?
- Duration of event?
- What changes have occurred?
- Progression?
- Severity?

Owners struggle to recognize chronic pain so ask for subtle deviations

Educate clients on recognizing subtle pain by pointing it out

Owner's input of pet's behavior at home helps with detection

Pattern of behavior is vital



Context matters

- Primary behavior problems have a discernable pattern
  - Initiation (warning)
  - Pause
  - Response by recipient
  - End. Or further action
  - End.

- If no pattern or inappropriate ➔ physical or behavioral pathology

A change in behavior, especially if:

- Sudden onset
- New behavior
- Middle-aged or older animal

Senior Tail Waggers

Strong indications for physical condition / pain

Observe beyond the physical exam

How the pet carries themselves indicates how energy is expended:
at rest & moving

Monitoring cats in their effort to escape provides information

Physical exam

DVM360

Response to palpation often used with limited sensitivity & specificity

Preliminary study evaluating tests used to diagnose canine cranial cruciate ligament failure

B. Carobbi and M. G. Ness*

Journal of Small Animal Practice (2009)
50, 224–226
DOI: 10.1111/j.1748-5827.2008.00723.x

Accepted: 16 November 2008; Published online: 13 March 2009

Stress can impact ability to detect physical changes

Journal of Feline Medicine and Surgery
Volume 13, Issue 10, October 2011, Pages 733-737

https://doi-org.prox.lib.ncsu.edu/10.1016/j.jfms.2011.07.003

Original Article

Evaluation of the Effects of Hospital Visit Stress on Physiologic Parameters in the Cat

Jessica M Quimby, DVM, DACVIM[1,*], Melissa L Smith, DVM[1], and Katharine F Lunn, BVMS, MS, PhD, MRCVS, DACVIM[1]

J Vet Intern Med 2002;16:123–132

Acute Stress Hyperglycemia in Cats Is Associated with Struggling and Increased Concentrations of Lactate and Norepinephrine

Jacqueline S. Rand, Emily Kinnaird, Anthony Baglioni, Judith Blackshaw, and Jan Priest

Handling patients to minimize fear and pain

Friendly handling is an important measure for accurate exam

Journal of Feline Medicine and Surgery
Volume 13, Issue 5, May 2011, Pages 364-375

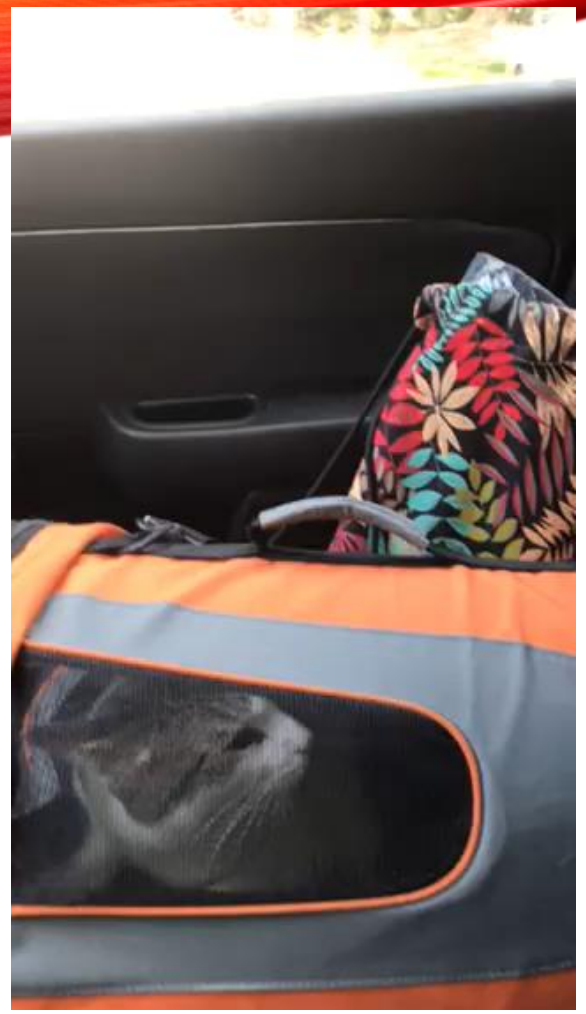
https://doi-org.prox.lib.ncsu.edu/10.1016/j.jfms.2011.03.012

Special Article

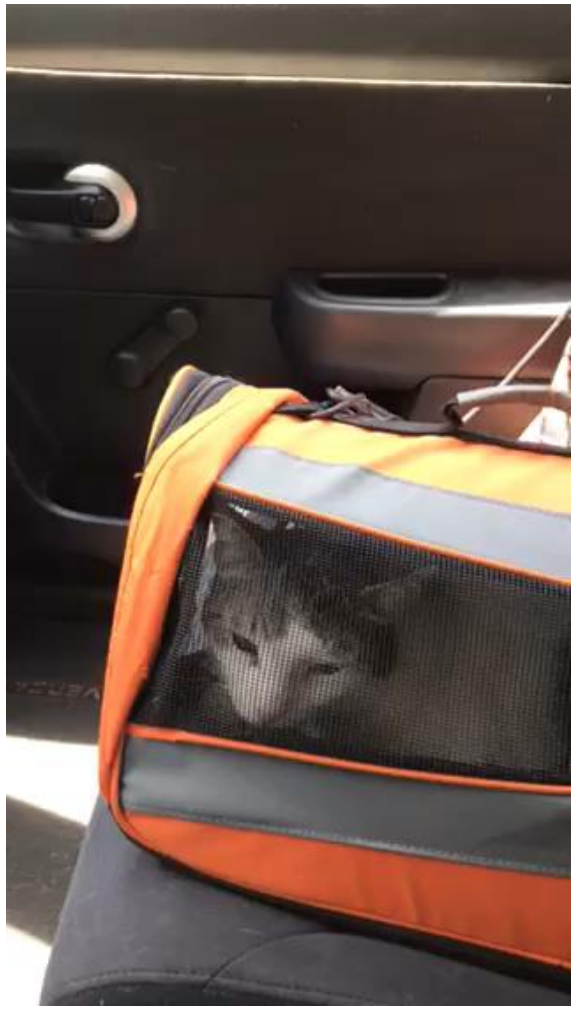
AAFP and ISFM Feline-Friendly Handling Guidelines

Ilona Rodan, DVM DABVP (Feline), Eliza Sundahl, DVM DABVP (Feline), Hazel Carney, DVM MS DAVBP (Canine Feline), Anne-Claire Gagnon, DVM, Sarah Heath, BVSc DipECVBM-CA CCAB MRCVS, Gary Landsberg, DVM MRCVS DACVB DECVBM-CA, Kersti Seksel, BVSc (Hons) MRCVS FACVSc DACVB DECVBM-CA, and Sophia Yin, DVM MS

Pre-veterinary pharmaceuticals anti-anxiolytics can assist exam



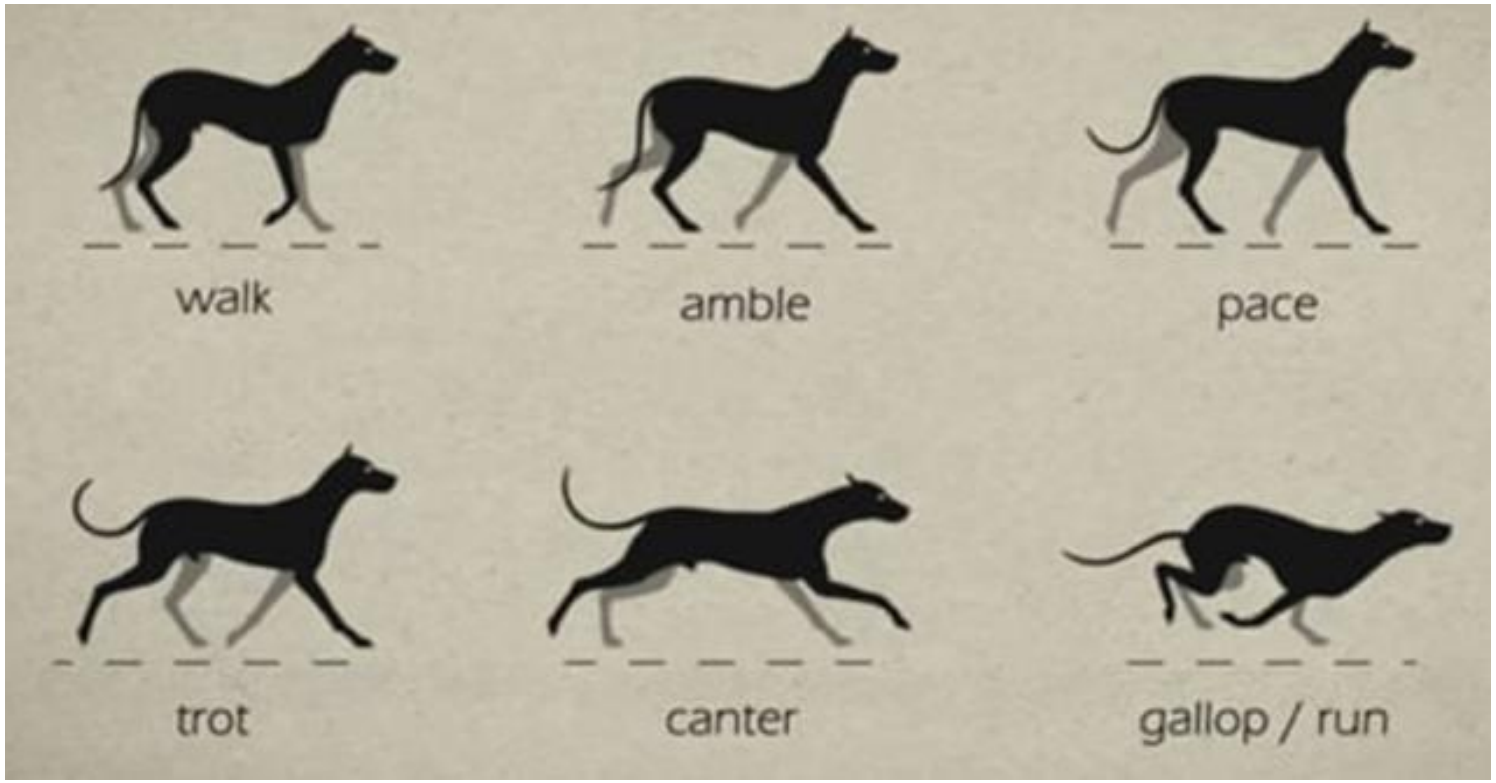
Without Meds



With Meds

Medication can decrease stress prior to examination

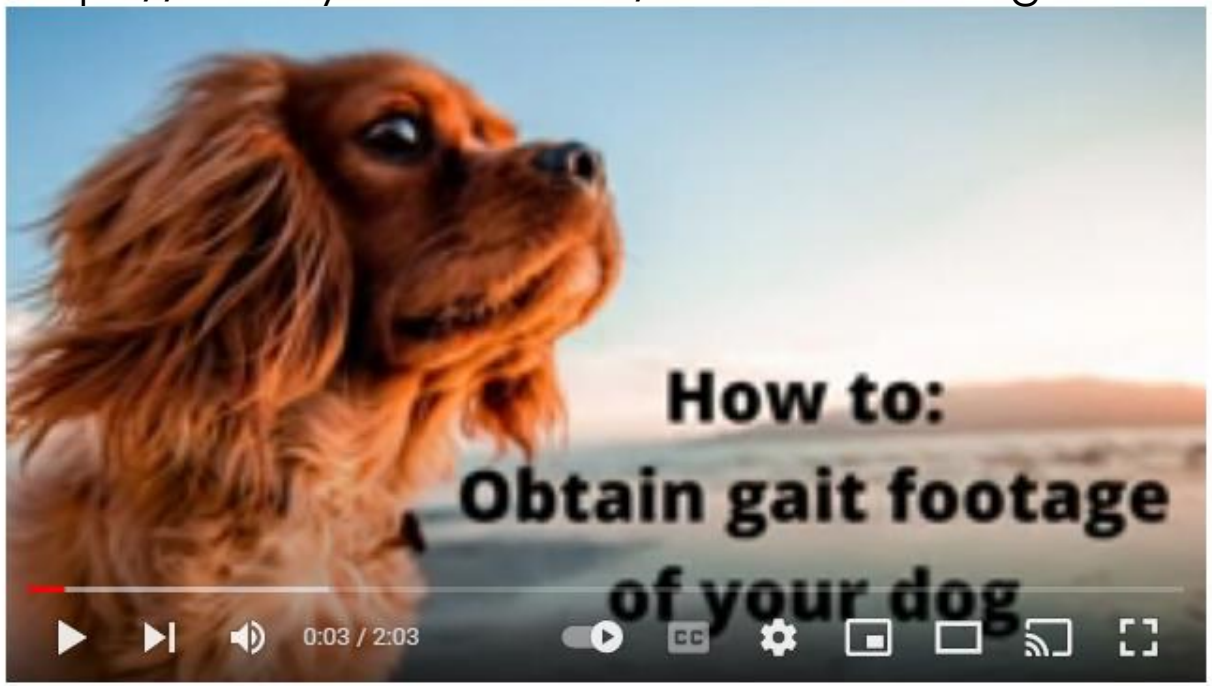
Gait evaluation to detect lameness



Owners can be guided to record gait videos for detection & monitoring

YouTube Search

https://www.youtube.com/watch?v=6u7sTgUmYb8



How to: Obtain gait footage of your dog

Lincoln Animal Be...
38 subscribers
Subscribe
31
Share

Imaging / Radiographs

Merck Veterinary Manual

Imaging confirms but does not replace physical exam findings

Research article | Open Access | Published: 27 January 2012

Relationship of orthopedic examination, goniometric measurements, and radiographic signs of degenerative joint disease in cats

B Duncan X Lascelles, Yaa-Hui Dong, Denis J Marcellin-Little, Andrea Thomson, Simon Wheeler & Maria Correa

Palpation of joint pain & radiographic OA correlate poorly

Preliminary study evaluating tests used to diagnose canine cranial cruciate ligament failure

B. Carobbi and M. G. Ness*

Journal of Small Animal Practice (2009)
50, 224–226
DOI: 10.1111/j.1748-5827.2008.00723.x

Accepted: 16 November 2008; Published online: 13 March 2009

Tools to detecting pain

Pain screening tools have pros and cons

Benefits

- Raise red flags
- Monitor overtime

Limitations

- Not specific for diagnosis
- User ability varies

Pain Scales

- Acute pain primarily & Veterinary monitoring
- Standardized capture behavior signs
- Incorporate into practice
- Converted into scores
- Types:
  - Colorado State University Acute Pain Scale (not valid)
  - Glasgow short-form Composite Measure Pain scale (~valid)
  - UNESP multi-dimensional pain scale (valid)
  - Feline Grimace Scale (valid)

Colorado State University Acute Pain Scale

Colorado State University

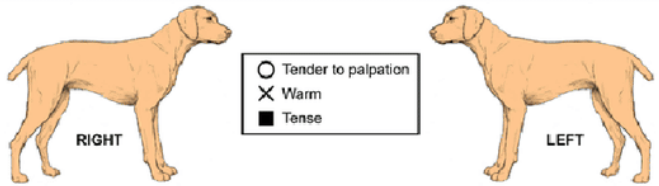
Date _____

Time _____

Colorado State University
Veterinary Medical Center
Canine Acute Pain Scale

Rescore when awake
- ☐ **Animal is sleeping, but can be aroused - Not evaluated for pain**
- ☐ **Animal can't be aroused, check vital signs, assess therapy**

Pain Score	Example	Psychological & Behavioral	Response to Palpation	Body Tension
0		☐ **Comfortable** when resting ☐ **Happy, content** ☐ Not bothering wound or surgery site ☐ Interested in or curious about surroundings	☐ **Nontender** to palpation of wound or surgery site, or to palpation elsewhere	Minimal
1		☐ **Content to slightly unsettled** or restless ☐ **Distracted easily** by surroundings	☐ **Reacts to palpation** of wound, surgery site, or other body part by **looking around, flinching,** or **whimpering**	Mild
2		☐ Looks **uncomfortable** when resting ☐ May **whimper** or cry and may **lick or rub wound** or surgery site when unattended ☐ Droopy ears, **worried facial expression** (arched eye brows, darting eyes) ☐ **Reluctant to respond** when beckoned ☐ **Not eager to interact** with people or surroundings but will look around to see what is going on	☐ Flinches, whimpers cries, or guards/pulls away	Mild to Moderate **Reassess analgesic plan**
3		☐ **Unsettled, crying, groaning, biting or chewing** wound when unattended ☐ **Guards or protects** wound or surgery site by altering weight distribution (i.e., limping, shifting body position) ☐ **May be unwilling to move all** or part of body	☐ May be **subtle** (shifting eyes or increased respiratory rate) if dog is too painful to move or is stoic ☐ May be **dramatic**, such as a sharp cry, growl, bite or bite threat, and/or pulling away	Moderate **Reassess analgesic plan**
4		☐ **Constantly groaning or screaming** when unattended ☐ May bite or chew at wound, but unlikely to move ☐ **Potentially unresponsive** to surroundings ☐ **Difficult to distract** from pain	☐ **Cries at non-painful palpation** (may be experiencing allodynia, wind-up, or fearful that pain could be made worse) ☐ May react aggressively to palpation	Moderate to Severe **May be rigid to avoid painful movement** **Reassess analgesic plan**



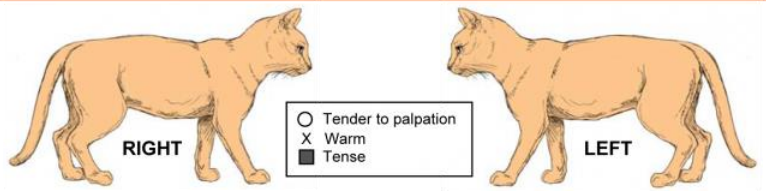
Comments _____

Supported by an Unrestricted Educational Grant from Pfizer Animal Health

Colorado State University

Colorado State University
Veterinary Medical Center
Feline Acute Pain Scale

Pain Score	Example	Psychological & Behavioral	Response to Palpation	Body Tension
No Score		❑ **Animal is sleeping and cannot be evaluated**		
0		❑ **Content and quiet** when unattended ❑ **Comfortable** when resting ❑ Interested in or **curious** about surroundings	❑ **Not bothered** by palpation of wound or surgery site, or to palpation elsewhere	Minimal
1		❑ **Signs are often subtle and not easily detected in the hospital setting**; more likely to be detected by the owner(s) at home ❑ Earliest signs at home may be **withdrawal from surroundings or change in normal routine** ❑ In the hospital, may be content or **slightly unsettled** ❑ **Less interested** in surroundings but will look around to see what is going on	❑ May or may not react to palpation of wound or surgery site	Mild
2		❑ Decreased responsiveness, **seeks solitude** ❑ **Quiet**, loss of brightness in eyes ❑ **Lays curled up or sits tucked up** (all four feet under body, shoulders hunched, head held slightly lower than shoulders, tail curled tightly around body) with eyes partially or mostly closed ❑ **Hair coat appears rough** or fluffed up ❑ May intensively groom an area that is painful or irritating ❑ Decreased appetite, **not interested in food**	❑ **Responds aggressively or tries to escape** if painful area is palpated or approached ❑ Tolerates attention, may even perk up when petted as long as painful area is avoided	Mild to Moderate **Reassess analgesic plan**
3		❑ Constantly **yowling, growling, or hissing** when unattended ❑ May bite or chew at wound, but **unlikely to move** if left alone	❑ **Growls or hisses at non-painful palpation** (may be experiencing allodynia, wind-up, or fearful that pain could be made worse) ❑ **Reacts aggressively** to palpation, **adamantly pulls away** to avoid any contact	Moderate **Reassess analgesic plan**
4		❑ Prostrate ❑ Potentially **unresponsive** to or unaware of surroundings, difficult to distract from pain ❑ Receptive to care (even mean or wild cats will be more tolerant of contact)	❑ **May not respond** to palpation ❑ **May be rigid to avoid painful movement**	Moderate to Severe **May be rigid to avoid painful movement** **Reassess analgesic plan**



Comments _____

SHORT FORM OF THE GLASGOW COMPOSITE MEASURE PAIN SCALE

Dog's name _____ **Date** / / **Time** _____

Patient ID _____

Procedure or condition _____

In the sections below, please circle the appropriate score in each list and sum these to give the total score

A. Look at dog in kennel

(I) Is the dog?

Quiet	0
Crying or whimpering	1
Groaning	2
Screaming	3

(II) Is the dog?

Ignoring any wound or painful area	0
Looking at wound or painful area	1
Licking wound or painful area	2
Rubbing wound or painful area	3
Chewing wound or painful area	4

In the case of spinal, pelvic or multiple limb fractures, or where assistance is required to aid locomotion, do not carry out section B and proceed to C.

Please tick if this is the case ☐

B. Put lead on dog and walk animal out of the kennel

(III) When the dog rises/walks, is it?

Normal	0
Lame	1
Slow or reluctant	2
Stiff	3
It refuses to move	4

C. If the dog has a wound or painful area including abdomen, apply gentle pressure 2 inches (5 cm) around the site

(IV) Does it?

Do nothing	0
Look round	1
Flinch	2
Growl or guard area	3
Snap	4
Cry	5

D. Overall

(V) Is the dog?

Happy and content or happy and bouncy	0
Quiet	1
Indifferent or non-responsive to surroundings	2
Nervous or anxious or fearful	3
Depressed or non-responsive to stimulation	4

(VI) Is the dog?

Comfortable	0
Unsettled	1
Restless	2
Hunched or tense	3
Rigid	4

Total score (I + II + III + IV + V + VI) = _____

The pain score is the sum of the rank scores, with a maximum score of 24 (20 if mobility is impossible to assess). The tot score is a useful indicator of analgesic requirement; the recommended analgesic intervention level is 6/24 (or 5/20).

Glasgow short-form pain scale

Subscale 1: PAIN EXPRESSION (0 – 12)		
Miscellaneous behaviors	Observe and mark the presence of the behaviors listed below	
	A - The cat is laying down and quiet, but moving its tail	A
	B - The cat contracts and extends its pelvic limbs and/or contracts its abdominal muscles (flank)	B
	C - The cats eyes are partially closed (eyes half closed)	C
	D - The cat licks and/or bites the surgical wound	D
	• All above behaviors are absent	0
	• Presence of one of the above behaviors	1
	• Presence of two of the above behaviors	2
	• Presence of three or all of the above behaviors	3
Reaction to palpation of the surgical wound	• The cat does not react when the surgical wound is touched or pressed; or no change from pre-surgical response (if basal evaluation was made)	0
	• The cat does not react when the surgical wound is touched, but does react when it is pressed. It may vocalize and/or try to bite	1
	• The cat reacts when the surgical wound is touched and when pressed. It may vocalize and/or try to bite	2
	• The cat reacts when the observer approaches the surgical wound. It may vocalize and/or try to bite The cat does not allow palpation of the surgical wound	3
Reaction to palpation of the abdomen/flank	• The cat does not react when the abdomen/flank is touched or pressed; or no change from pre-surgical response (if basal evaluation was made). The abdomen/flank is not tense	0
	• The cat does not react when the abdomen/flank is touched, but does react when it is pressed. The abdomen/flank is tense	1
	• The cat reacts when the abdomen/flank is touched and when pressed. The abdomen/flank is tense	2
	• The cat reacts when the observer approaches the abdomen/flank. It may vocalize and/or try to bite The cat does not allow palpation of the abdomen/flank	3
Vocalization	• The cat is quiet, purring when stimulated, or miaows interacting with the observer, but does not growl, groan, or hiss	0
	• The cat purrs spontaneously (without being stimulated or handled by the observer)	1
	• The cat growls, howls, or hisses when handled by the observer (when its body position is changed by the observer)	2
	• The cat growls, howls, hisses spontaneously (without being stimulated or handled by the observer)	3

UNESP multi-dimensional pain scale

Feline Grimace scales

http://www.felinegrimacescale.com

Evangelista et al. 2019

Simplified questionnaires created for feline arthritis detection

- Chronic pain (OA) & Owner monitoring
- Simple
  - Client-specific outcome measures
  - Likert scales
  - Yes or No
- Set up can be time consuming
- Scales
  - Feline Musculoskeletal Pain index (valid)
  - Montreal Cat Arthritis Test (~valid)

Owner geared scales may aid with detection

1. Does your cat jump up normally? ☐ Yes ☐ No
2. Does your cat jump down normally? ☐ Yes ☐ No
3. Does your cat climb **up** stairs or steps normally? ☐ Yes ☐ No
4. Does your cat climb **down** stairs or steps normally? ☐ Yes ☐ No
5. Does your cat run normally? ☐ Yes ☐ No
6. Does your cat chase moving objects (toys, prey, etc.)? ☐ Yes ☐ No

Journal of Feline Medicine and Surgery
Volume 22, Issue 12, December 2020, Pages 1137-1147

https://doi-org.prox.lib.ncsu.edu/10.1177/1098612X20907424

Original Article

Development of a checklist for the detection of degenerative joint disease-associated pain in cats

Masataka Enomoto [1], B Duncan X Lascelles [1,5], and Margaret E Gru

Figure 5 Proposed Feline Musculoskeletal Pain Screening Checklist (Feline MiPSC). DJD = degenerative joint disease

NC STATE UNIVERSITY

NAME: DATE:

FELINE MUSCULOSKELETAL PAIN INDEX

Please take some time to complete the following questions.

Please mark the circle that best describes your cat's ability to perform the following activities.

1. Walk and/or move easily?						
○	○	○	○	○		○
Normal	Not quite normal	Somewhat worse than normal	Barely, or with great effort	Not at all		Don't know or not applicable

2. Run?						
○	○	○	○	○		○
Normal	Not quite normal	Somewhat worse than normal	Barely, or with great effort	Not at all		Don't know or not applicable

3. Jump up (how well and how easily)?						
○	○	○	○	○		○
Normal	Not quite normal	Somewhat worse than normal	Barely, or with great effort	Not at all		Don't know or not applicable

4. Jump up to kitchen-counter height in one try?						
○	○	○	○	○		○
Normal	Not quite normal	Somewhat worse than normal	Barely, or with great effort	Not at all		Don't know or not applicable

Feline Musculoskeletal Pain index

RESEARCH ARTICLE

Criterion Validation Testing of Clinical Metrology Instruments for Measuring Degenerative Joint Disease Associated Mobility Impairment in Cats

Margaret E. Gruen[1], Emily H. Griffith[2], Andrea E. Thomson[1], Wendy Simpson[3], B. Duncan X. Lascelles[1,4,5]*

Evaluation and comparison of pain questionnaires for clinical screening of osteoarthritis in cats

Sarah Stadig ,[1] B Duncan X Lascelles ,[2] Gorel Nyman,[1] Anna Bergh [1]

Refinement of the Feline Musculoskeletal Pain Index (FMPI) and development of the short-form FMPI

Masataka Enomoto [1], B Duncan X Lascelles [1,5], James B Robertson [6], and Margaret E Gruen [2,3,7]

Supplementary Information

Preliminary Validation and Reliability Testing of the Montreal Instrument for Cat Arthritis Testing, for Use by Veterinarians, in a Colony of Laboratory Cats

MI-CAT(V) – Montreal Instrument for Cat Arthritis Testing (Veterinary)

#	Category	Assessment Criteria	Grade
Assign a value for each of categories 1-4 prior to hands-on examination. The cat should be allowed to walk on exam room floor, be placed on a low bench or chair to observe willingness/ability to jump down, and encouraged to jump up by placing the empty carrier on a bench/chair in front of the cat.			
1	Exploratory Behavior	Walks, runs or jumps freely	0
		Walks slowly/cautiously, or with abnormal or lowered body posture	1
		No ambulation/exploratory behavior	2
2	a. Body Posture – **head, torso, tail**	Ambulates/stands/sits/lies with even weight distribution from front to rear, back level, head up, tail above horizontal	0
		Head low/tail lowered (not tucked)	1
		Overt abnormalities: weight shifted forward or backward, hunched back, limp tail - 1 finding	2
		- ≥2 findings	3
	b. Body Posture – **front limbs**	Ambulates/stands/sits/lies with limbs in normal state of flexion/extension, even weight distribution from right to left	0
		Overt abnormalities: limb hyperflexion, limb hyperextension, unequal weight distribution from right to left, or other asymmetry - 1 finding	1
		- ≥2 findings	2
	c. Body Posture – **rear limbs**	Ambulates/stands/sits/lies with limbs in normal state of flexion/extension, even weight distribution from right to left	0
		Overt abnormalities: plantigrade stance, limb hyperflexion or hyperextension, unequal weight distribution from right to left, or other asymmetry - 1 finding	1
		- ≥2 findings	2
3	Gait/Locomotion	Normal gait, jumps up/down willingly and smoothly	0
		Normal gait, reluctant or unwilling to jump	1
		Generally normal gait, occasionally awkward (e.g., misses a jump or missteps)	2
		Mildly to moderately abnormal gait (e.g., stiff or weak, or with abnormal limb placement or carriage)	3
		Obviously limping on 1 or more limbs	4

Montreal Cat Arthritis Test

Refinement of the Montreal Instrument for Cat Arthritis Testing, for Use by Veterinarians: detection of naturally occurring osteoarthritis in laboratory cats

1–13
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sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/1098612X17730172
journals.sagepub.com/home/jfms
This paper was handled and processed by the American Editorial Office (AAFP) for publication in *JFMS*
SAGE

Mary P Klinck[1,2], Beatriz P Monteiro[1], Bertrand Lussier[1,2], Martin Guillot[1,2], Maxim Moreau[1,2], Colombe Otis[1]

Development and preliminary validity and reliability of the montreal instrument for cat arthritis testing, for use by caretaker/owner, MI-CAT(C), *via* a randomised clinical trial

Mary P. Klinck[a], Margaret E. Gruen[b,1], Jérôme R.E. del Castillo[a], Martin Guillot[a,2],

Preliminary Validation and Reliability Testing of the Montreal Instrument for Cat Arthritis Testing, for Use by Veterinarians, in a Colony of Laboratory Cats

Mary P. Klinck [1], Pascale Rialland [1], Martin Guillot [1], Maxim Moreau [1], Diane Frank [2]

Owner geared monitoring for pain in dogs

- Osteoarthritis focused
- Chronic pain & owner monitoring
- Simple & valid
  - Liverpool Osteoarthritis in Dogs (LOAD)
  - Canine Brief Pain Inventory (CBPI)
- More involved & moderately valid
  - Client-Specific Outcome Measures (CSOM)

UNIVERSITY OF LIVERPOOL

Initial Visit

Liverpool Osteoarthritis in Dogs (LOAD)

Owner questionnaire for dogs with mobility problems

Dear Owner,

Thank you for agreeing to complete this questionnaire.

Your assistance in this endeavour will enable us to gather valuable information about your pet, and is a vital component in our ongoing quest to combat painful and debilitating diseases such as arthritis. It is important that all questions are answered to the best of your ability and if you have a question regarding the questionnaire, please contact a health care member from your veterinary clinic.
Thank you again for your help.

Answering the questions

Most of the questions are fairly simple. It is important that you only check one box per question except where otherwise requested (e.g. Question 4 under Lifestyle).

If you are in any doubt as to how to answer a particular question, please contact a member of staff for assistance.

Owner's name: Pet's name:

Owner's phone number: Client number: Today's date:

Breed of pet: Pet's age: Sex: M ○ F ○

For office use only Reference limb: LF ○ RF ○ LH ○ RH ○ Reset

Background

1. How long has your pet been suffering with his/her mobility problem?

○ Up to 6 months ○ 6–12 months ○ 12–24 months ○ 24–36 months ○ more than 36 months

2. Has your dog been diagnosed as suffering from any other problems in addition to his/her orthopedic disease?

○ No ○ Yes Please list these if you can:

Liverpool Osteoarthritis in Dogs (LOAD)

Validation of a client-based clinical metrology instrument for the evaluation of canine elbow osteoarthritis

OPEN ACCESS Freely available online PLOS ONE

Evaluation of Construct and Criterion Validity for the 'Liverpool Osteoarthritis in Dogs' (LOAD) Clinical Metrology Instrument and Comparison to Two Other Instruments

Myles Benjamin Walton[1], Emily Cowderoy[1], Duncan Lascelles[2], John F. Innes[1]*

Canine Brief Pain Inventory

Description of pain:
Rate your dog's pain:

1. Fill in the oval next to the one number that best describes the pain at its **worst** in the last 7days.

○0 ○1 ○2 ○3 ○4 ○5 ○6 ○7 ○8 ○9 ○10

No pain — Extreme pain

2. Fill in the oval next to the one number that best describes the pain at its **least** in the last 7 days

○0 ○1 ○2 ○3 ○4 ○5 ○6 ○7 ○8 ○9 ○10

No pain — Extreme pain

3. Fill in the oval next to the one number that best describes the pain at its **average** in the last 7 days.

○0 ○1 ○2 ○3 ○4 ○5 ○6 ○7 ○8 ○9 ○10

No pain — Extreme pain

4. Fill in the oval next to the one number that best describes the pain as it is **right now**.

○0 ○1 ○2 ○3 ○4 ○5 ○6 ○7 ○8 ○9 ○10

No pain — Extreme pain

Description of function:

Fill in the oval next to the one number that best describes how during the last 7 days **pain has interfered** with your dog's:

5. **General Activity**

○0 ○1 ○2 ○3 ○4 ○5 ○6 ○7 ○8 ○9 ○10

Does not interfere — Completely interferes

6. **Enjoyment of Life**

○0 ○1 ○2 ○3 ○4 ○5 ○6 ○7 ○8 ○9 ○10

Does not interfere — Completely interferes

Canine Brief Pain Inventory

Ability of the Canine Brief Pain Inventory to detect response to treatment in dogs with osteoarthritis

Dorothy Cimino Brown, DVM, MSCE, DACVS; Raymond C. Boston, PhD; James C. Coyne, PhD; John T. Farrar, MD, PhD

Power of treatment success definitions when the Canine Brief Pain Inventory is used to evaluate carprofen treatment for the control of pain and inflammation in dogs with osteoarthritis

Dorothy Cimino Brown, DVM, MS; Margie Bell, MS; Linda Rhodes, VMD, PhD

Client Specific Outcome Measures (CSOM)

Veterinarian defines set of activities = more involved

JOURNAL OF
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J. vet. Pharmacol. Therap. **36**, 609–616. doi: 10.1111/jvp.12050.

Multicenter randomized prospective clinical evaluation of meloxicam administered via transmucosal oral spray in client-owned dogs

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Cozzi, E.M., Spensley, M.S. Multicenter randomized prospective clinical evaluation of meloxicam administered via transmucosal oral spray in client-owned dogs. *J. vet. Pharmacol. Therap.* **36**, 609–616.

Videos of behaviors and movement at home aid monitoring

Response to analgesic treatment is confirming

Before and after cat grooms

Summary

Take Aways: Part 1

- Pain states are common in pets
- Signs of pain vs behavior overlap
- Many behavior conditions may be pain in disguise
- History taking and clinic observations are vital
- Videos of behavior at home aid in diagnosis & monitoring
- Other detection modalities exist with limitations

Thank You!

Enjoy your break and meet back here for Part 2!

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