

Canine Aggression: Diagnosis and Treatment  
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Impact of unwanted behaviour

- ~6.5 MILLION pets are relinquished annually
  - **50% of these are dogs**
  - *Many are adolescents*
- ~1.5 million euthanized

*ASPCA.org*

Impact of unwanted behaviour

- *Aggression was number 1 behavioural reason given for relinquishment*

Mo D. Salman, Jennifer Hutchison, Rebecca Ruch-Gallie, Lori Kogan, John C. New Jr., Phillip H. Kass & Janet M. Scarlett (2000) behavioural Reasons for Relinquishment of Dogs and Cats to 12 Shelters, *Journal of Applied Animal Welfare Science*, 3:2, 93-106

What is aggression

- Threats or harmful behaviour towards another individual.
- Many reasons for aggressive behaviour.
- Canine Aggression
- Aggression:
  - *Distance-increasing signs*
  - *Growl, snap, snarl, bark, bite*
  - Impact of Canine Aggression
- Most common condition treated at veterinary behaviour clinics
- Strain on HAB
- Injury to family members
- Injury to general public
- Impact of Canine Aggression

Welfare concerns

- Chronic stress
  - *Cognitive/learning problems*
  - *Decreased healing ability*
  - *Increased susceptibility to illness*
  - *Weight loss*
  - *Physical injury/wear*
- Medical differentials
- Aggression is a symptom, not a diagnosis
- Medical Differentials
- Anything that can cause pain, physical discomfort, confusion
  - *Dermatologic*
  - *Orthopedic*

- *Neurologic*
- *Urinary*
- *Gastrointestinal*
- *Dental*
- *Ophthalmic*
- *Anything else!*
- Medical Differentials
- Additionally
  - *Endocrine*
  - *Physiologic*
  - *Infectious or inflammatory*
  - *Neoplasia*
  - Remember DAMNIT scheme!
- Medical Assessment
- Minimum database
  - *Physical examination*
  - *CBC/Chemistry/T4/UA*
  - *Other diagnostics depending on clinical signs*
- Diagnosing Types of Aggression
  1. Behavioural description of the dog's behaviour
  2. Who or what is the target of the behaviour
  3. Determine underlying motivation for the aggressive behaviour
  4. Determine context of aggression if needed

Example:

- Fear-based aggression towards unfamiliar people on walks
- Question

Which of the following is a behavioural description?

1. The dog was angry and bit the person.
2. The dog went crazy and went after the person.
3. The dog froze, then lunged forward and bit the person on the leg.
4. The dog was jealous

■ Answer!

Which of the following is a behavioural description?

1. The dog was angry and bit the person.
2. The dog went crazy and went after the person.
- 3. The dog froze, then lunged forward and bit the person on the leg.**
4. The dog was jealous

- Behavioural History
- History is key
  - *This is what allows for a successful behavioural assessment*
  - *Get ahead of time if possible*
  - *Open ended questions*
  - *Behavioural description*

- *What are the behaviours?*
  - Growling?
  - Snapping?
  - Tooth contact?
- *Target of the aggression*
  - Family member (adult? Child?)
  - Family dog
  - Unfamiliar people
  - Unfamiliar dog
  - Etc.
- *Underlying motivation*
  - What body language is the dog exhibiting?
- *Context*
  - What are the situations in which the aggression of concern has occurred
- *Additional Contexts*
  - What are the situations in which the aggression of concern has occurred

#### Remember Compassion

- Clients want help
- Often strong emotions
  - *Anxiety and stress*
  - *Blame*
  - *Sadness*
  - *Anger*
  - *Guilt*
  - *Shame*
- Feel trapped by their dog's behaviour
- Have often tried many things before coming to you,
  - *You may not agree with what they have tried*
- Doing the best they could with the information they had at the time.
- They love and care for their dog
  - *even if they are the targets of aggression*

#### Motivation: Body Language and Context

- Understanding body language allows for early detection of a problem
  - *Mild signs of stress → Early intervention*
  - Prevention is always easier than treatment
- Body language indicating stress is a prelude to a bite
- Comfortable
  - *Relaxed face*
  - *Relaxed body*
  - *Ears up or relaxed*
  - *Tail neutral, easy wag*
- Uncomfortable

- *Leaning away*
- *Turning away*
- *Whale eye*
- *Ears back*
- *Tight facial muscles*
- *Tail down or tucked*
- *Piloerection*
- Uncomfortable
  - *Licking lips*
  - *Yawning*
  - *Freezing*
  - *Avoidance*
  - *Hiding*
  - *Vocalize (whine, growl, bark)*
  - Client Education: Body Language

#### Assessing Behaviour at the Vet Clinic

- May not show the same behaviours at clinic as in aggressive context
- Don't need to see the actual behaviour to be able to assess and help
- Assessing Behaviour at the Vet Clinic
- Video can be helpful if can be gotten without risk to others or the dog.
- Behaviour at vet can give idea of how well the dog copes with stress and change.
- Consider someplace other than the exam room if possible
  - *Parking lot*
  - *Staff meeting room*
- Safety precautions
  - *Inform everyone of the dog*
  - *Bring in/out minimizing triggers*
  - *Clients place muzzle before entering if necessary*

#### Diagnoses

- Diagnosing Types of Aggression
- 1. Behavioural description of the dog's behaviour
- 2. Who or what is the target of the behaviour
- 3. Determine underlying motivation for the aggressive behaviour
- 4. Determine context of aggression if needed

#### Example:

- Fear-based aggression towards unfamiliar people on walks
- What Aggression IS and IS NOT
- SPOILER: It is rarely due to Dominance!
- Dominance Relationships
  - *Develop over time to minimize fighting*
  - *Not known to be inter-species*
  - *Early research not generalizable to dog population*

- *Less important in inter-dog aggression than reinforcing appropriate behaviours*

#### Behavioural Differentials for Aggression

- Fear-Based Aggression
  - *Body language currently or historically indicating fear*
    - Can look confident
  - *Context includes situations where stressful interactions are occurring between dog and target*
  - Behavioural Differentials for Aggression
  - *No age, breed or sex predisposition*
  - *NOT dominance*
  - *Common reason aggression in the veterinary setting*
  - Behavioural Differentials for Aggression
- Possessive Aggression
  - *Anxiety associated with loss of preferred items*
  - *Usually accompanied by body language signs of anxiety*
  - *Can occur in young dogs*
    - Sometimes considered normal
  - *Freezing, staring, growling, snapping, showing teeth and/or biting when in possession of a desired object*
  - *Food, toy, stolen object*
- Territorial Aggression
  - *Occurs in house or other areas that the dog may consider territory such as a car.*
  - *May bark out of windows/doors.*
  - *Targets may include people or dogs*
- Conflict-Related Aggression
  - *Challenging to address in many cases*
  - *Diagnosis*
    - Dog initiates interaction at at some point it changes from positive → negative (from dog's perspective).
    - Solicitation → Anxiety
- Competitive Interdog Aggression
  - *Defense of valuable items, space or attention from another household dog*
- Redirected Aggression
  - *Unable to reach target and exhibits aggression towards nearby target*
  - *Generally secondary to fear or overarousal*
  - *Can be uninhibited*
- Pain-Related
  - *Self-protective behaviour*
  - *Often sudden without significant warning*
  - *May develop into fear-based aggression even after pain has been treated.*
- Predatory behaviour
  - *Unclear if aggression*
  - *Can be fatal*

- *Freezing, stalking, usually silent*
- *Triggered by movement, high-pitched sounds*
- Risk assessment

#### Risk Assessment

- Risk Factors
  - *Size of dog*
  - *Previous intensity*
  - *Frequency*
  - *Targets*
  - *Ability to maintain safety*
  - *Vulnerable people in contact with dog*

#### Rehoming / Euthanasia

- How risk averse are the clients?
- Can pet be rehomed safely?
- Are there medical issues making the situation more complex?

#### Treatment overview

- Setting Expectations
  - Most bites are predictable
  - Most dogs improve with treatment
    - *Significant improvement in 2-3 months.*
    - *But may take longer*
  - *Aggression is not cured but reduced*
  - *Lifelong management of behaviour will be needed*
  - Some dogs need medications long-term to life-long.
- May relapse if an unrelated stressor occurs
  - *If stable dog relapses, look for medical and environmental causes FIRST*
  - Not Dominance!
  - *Promote compassion for dog's fear or anxiety*
  - Treatment
- Three components:
  - *Environmental and Social Modification*
  - *Behaviour Modification*
  - *Medication and other modalities*
- Determine your comfort level
  - *Avoidance, risk assessment and refer immediately?*
  - *Avoidance, risk assessment, medications, refer for behaviour modification?*
  - *Do it all in-house?*
- Management
  - **Avoid or prevent situations that trigger aggressive behaviour**
    - *Will depend on who the target(s) are and where the aggression is taking place*

- **What safety equipment or precautions may be needed?**
  - *Muzzle in public?*
  - *Crate in the car?*
  - *Separate room when visitors come to the door?*
- Management Examples
  - Barking and lunging at people on walks
    - *Avoid walks – play in fenced backyard*
    - *Walk at times of day/locations where people won't be seen*
  - Equipment
    - *Basket muzzle*
    - *Head halter or front-clip harness*
    - *Backup leash and equipment*
- Management Examples
  - Growling at visitors to the house
    - *Pre-visit Setup*
      - Set up a sanctuary room
      - Crate dog
    - *Environmental Setup*
      - Prevent knocking/doorbell
      - Visitors text/call before arrival
    - *Equipment*
      - Basket muzzle
      - Head halter/front-clip harness
- Management Examples
  - Snapped at the toddler
    - *Not an immediate rehoming or euthanasia sentence for many dogs*
    - *Separate child and dog*
      - Set up a sanctuary area
        - *Crate, room, behind gate*
    - *Equipment*
      - Baby gates
      - Basket muzzle
      - Behaviour Modification
- I Get It!
- We're veterinarians, not animal trainers
- BUT...
  - *We are caretakers of mental as well as physical health*
  - *Clients respect our opinion, AND*
  - *Animals are learning all the time*

It's important to know how to interact with animals and what to recommend, that will benefit their mental health

- Question:
  - Which of the following is **not** recommended for use in treating aggressive behaviour

1. behavioural medications
2. Avoidance of triggers
3. Using treats
4. Using corrections such as prong, choke, and electronic collars

■ Answer!

Which of the following is **not** recommended for use in treating aggressive behaviour

1. Behavioural medications
2. Avoidance of triggers
3. Using treats
4. **Using corrections such as prong, choke, and electronic collars**

#### Considerations on Behaviour Modification for Aggression

- Physical force, physical or verbal corrections are contraindicated
- Goal: Change underlying emotional state

#### Associative and Instrumental Learning

- Consequence-Based Learning
  - *Instrumental learning*
  - *Operant conditioning*
  - *The **resulting effect** of a behaviour dictates whether or not the behaviour will happen again*
- Associative Learning
  - *Classical Conditioning*
  - *Pavlovian Conditioning*
  - *Learned association between an environmental stimulus and a predictive event.*
    - Doesn't rely on what the learner is doing
  - Example of associative Learning
- How Emotions are Impacted by Learning
- Emotions can be associated with stimuli, resulting in positive or negative emotional states
  - *Positive (good)*
    - Food, play
  - *Negative (poor)*
    - Scolding, corrections, aversive
  - Emotional associations can be made in a SINGLE trial
- BUT...
- Learning doesn't happen in a vacuum!
  - *Associative learning*                      *consequence-based learning*
  - *Associative learning can condition emotional responses*
  - *This can profoundly impact the human-animal bond and animal welfare*

Therefore HOW you train is as important, if not more so, than what is being trained.

Animals are always learning, even if you are not actively training them

- Behaviour Modification



- Foundation behaviours
  - *Done without triggers first*
    - Get it Game
    - Muzzle conditioning
    - Confinement training
  
- Desensitization and Counter-Conditioning
- Used if there is a strong emotional component to an unwanted behaviour
- Systemic gradual exposure to a stimulus in ways that does not trigger a fear/ anxiety response
  - *Should be guided by experienced professional*
  - Desensitization and Counter-Conditioning
- Goal: Change the underlying motivation of the behaviour from fear or anxiety to relaxed and happy.
  - *If the learner is relaxed and happy, they are less likely to exhibit the problem behaviour!*
  - Desensitization and Counter-Conditioning
- Ways to Control Stimulus Intensity
  - *Realism*
  - *Distance*
  - *Volume*
  - *Movement*
  - *Category of stimulus*
  - *Number of senses the stimulus activates*

#### Desensitization and Counter-Conditioning

1. Determine desensitization gradient / stimulus hierarchy
  2. Teach desired response in ways that promote a positive emotional state
  3. Teach desired response along gradient
- Desensitization and Counter-Conditioning
  - DS/CC to Target
    - *Determine desensitization gradient*
      - Easiest → Hardest
    - *Expose dog to the trigger in controlled way such that fear or aggression response not triggered*
      - Distance is your friend
    - *Physical interaction is not always the goal*
      - Desensitization and Counter-Conditioning
  - At or over threshold
  - What it should look like
  - Example of Using Inappropriate Training
    - Bear

#### Behavioural Medications

- Behavioural Medication Usage (General Principles)
- When to consider psychotropic medication
  - *If behaviour is:*
    - more intense than normal
    - out of proportion to the amount of trigger
    - out of context
  - *If emotion is getting in the way of learning*
  - *There is no non-stressful starting point for treatment*
  - *If learning doesn't seem to be "sticking"*
  - *If multiple anxiety conditions exist*
  - *If behavioural euthanasia is being considered*
- Psychotropic medications can promote:
  - *Positive mood*
  - *Improved focus*
  - *Neuroplasticity*
- Most common client questions:
  - *Will my pet be sedated*
    - Or turn into a zombie?
  - *Will their personality change?*
  - *What are the side effects?*
  - *Will they need medications lifelong?*
- Think about:
  - *The condition you are treating*
  - *How you want to use the medication*
  - *What concurrent diseases does the pet have*
  - *What concurrent medications is the pet taking*

## Setting Expectations

- Medications:
  - *Will not cure aggression*
    - Aggression has no cure
  - *Often won't modify aggressive behaviour significantly on its own*
    - Must be in combo with management / behaviour modification
    - Makes dog more receptive to the training
- Limbic System
- Behavioural Medications (Overview)
- Mainstay Medications
  - *Longer to take effect*
  - *Effects lasts longer*
  - *Don't tend to be sedating*
  - *Can't be used situationally*
  - *Not usually used in combination with other mainstay medications*
  - Increase aggression?
  - Behavioural Medications (Overview)

- Situational /Adjunct
  - *Rapid effect (30min – 2hrs)*
  - *Effects shorter-lasting*
  - *May be sedating*
  - *Can be used situationally*
  - *Can be used as daily adjunct to mainstay medication*
  - *Many can be used together*
  - Important Neurotransmitters
- GABA
  - *Inhibitory*
  - *Synthesized from glutamate*
  - *Action:*
    - Activates GABA receptors → hyperpolarizes postsynaptic cell → CALMING, decreases vigilance
  - *Medications that increase activity*
- Mainstay Neurotransmitters
- Serotonin
  - *Complex effects!!*
  - *Modulates:*
    - Mood (including anxiety)
    - Cognition
    - Learning
    - Sleep—wake cycle
- Mainstay Neurotransmitters
- Norepinephrine
  - *Modulates:*
    - Attention
    - Vigilance
    - Sympathetic NS
      - Dopamine
  - *Modulates:*
    - Feeling of reward
    - Movement modulation
- Mainstay Medications
- Selective Serotonin Reuptake Inhibitors (SSRIs)
  - *Action*
    - Blocks reuptake of serotonin into presynaptic cell
  - *Effect*
    - Changes in post-synaptic receptors resulting in decreased anxiety, anxiety and impulsivity
  - Mainstay Medications
- Selective Serotonin Reuptake Inhibitors (SSRIs)
  - *Side effects*
    - Calming effect

- Decreased appetite
    - V/D uncommon
    - Warn re: increased irritability
  - Mainstay Medications
- Selective Serotonin Reuptake Inhibitors (SSRIs)
  - *Examples*
    - Fluoxetine (Prozac<sup>®</sup>) – 1-2 mg/kg q24h
      - **Reconcile<sup>®</sup>**: FDA-approved for Separation Anxiety + behaviour Modification
      - *Off-label usage for aggression*
    - Paroxetine (Paxil<sup>®</sup>) – 1-2 mg/kg q24h
    - Sertraline (Zoloft<sup>®</sup>) – 1-4 mg/kg q24h
  - Mainstay Medications
- Tricyclic Antidepressants (TCAs)
  - *Action*
    - Blocks reuptake of serotonin and norepinephrine into presynaptic cell
  - *Effect*
    - Changes in post-synaptic receptors resulting in decreased anxiety, anxiety and impulsivity
  - Mainstay Medications
- Tricyclic Antidepressant (TCAs)
  - *Side effects*
    - Calming effect
    - Decreased appetite
    - Dry mouth
    - Urinary retention, constipation
    - V/D uncommon
    - Decrease seizure threshold
    - Cardiac effects
    - Warn re: increased irritability
  - Mainstay Medications
- Tricyclic Antidepressant (TCAs)
  - *Examples*
    - Clomipramine (2.2-4.4mg/kg/day split BID)
      - *Most serotonin-selective TCA*
      - **Clomicalm<sup>®</sup>** – FDA-approved for treating separation anxiety + bmod
      - *Off-label for aggression*

#### Situational / Adjunct Medications

- Benzodiazepines
  - *Action:*
    - Increase activity of GABA receptors
    - Schedule IV controlled drugs

- *Effects*
  - Quick acting (30-60min)
  - May cause sedation
  - Calming effect
- Benzodiazepines
- *Side effects*
  - Excessive sedation
  - Polyphagia
  - Paradoxical excitation
  - Disinhibition of aggressive behaviour? Use Caution!
- *Examples*
  - Alprazolam
  - Lorazepam
- Gabapentin (10-40mg/kg up to 8hr)
  - *Action*
    - Inhibition of voltage-sensitive Ca<sup>2+</sup> channels which affects depolarization
  - *Effect*
    - Effect in ~2hrs
    - General calming
    - May increase sociability
  - *Side effects*
    - Sedation
- Trazodone (3-5mg/kg up to q8hr, poss higher)
  - *Mechanism*
    - Serotonin receptor antagonist and reuptake inhibitor (SARIs)
  - *Effect*
    - Effect in 1-2 hrs
    - General calming
  - *Side effects*
    - Sedation
    - Rare irritability
    - Serotonin Syndrome
- Serotonin Syndrome
  - *Always discuss if combining products that increase serotonin*
  - *Signs*
    - Lethargy
    - Agitation
    - Confusion
    - Vocalization
    - Hyperthermia
    - Coma/Death

#### Tips for Medicating Dogs

- Avoid manual pilling

- Hiding Medications
  - *Strongly flavored/smelling carrier*
    - Separate from food
  - *Flavor the medication*
    - Flavored tablets
    - Flavored compounded liquid
- Transdermal?
  - Other Modalities
- Pheromone products
  - *Dog Appeasement Pheromone (DAP)*
  - *Comfort Zone*
- Body Wrap (supervised only)
  - *Thundershirt*
  - *Anxiety Wrap*

#### Conclusions

- Aggressive behavior can be assessed in the veterinary setting
- Aggressive behaviour is treatable but not curable
- Not dominance
- Force is not needed
- Early intervention is best
- Cornerstones: Management and safety
- Decrease fear/anxiety through desensitization and counter-conditioning
- Behavioural medications can significantly improve outcome