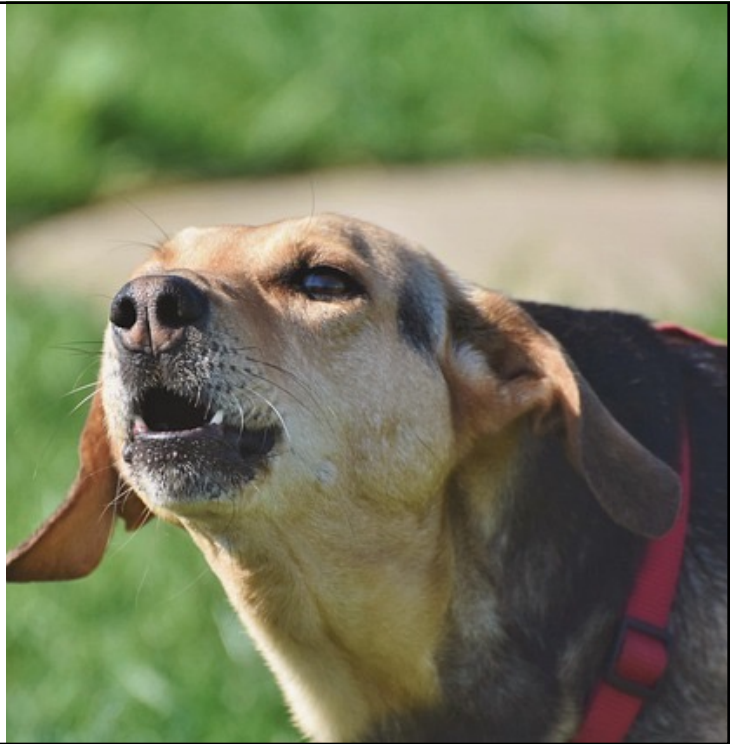


Canine Aggression: Diagnosis and Treatment

Valli Parthasarathy, PhD, DVM, DACVB

Synergy Behavior Solutions, Portland, OR



1

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) Behavioral Reasons for Relinquishment of Dogs and Cats to 12 Shelters, *Journal of Applied Animal Welfare Science*, 3:2, 93-106



2

Canine Aggression

Threats or harmful behaviour towards another individual

- Distance-increasing signs
- Growl, snap, snarl, bark, bite



3

Impact of Canine Aggression

Most common condition treated at vet behaviour clinics

- Strain on Human-Animal Bond
- Injury to family members
- Injury to general public



4

Impact of Canine Aggression

Welfare Concerns

- ❑ **Chronic stress**
 - ❑ Cognitive/learning inhibition
 - ❑ ↓ healing
 - ❑ ↑ susceptibility to illness
 - ❑ Weight loss
 - ❑ Physical injury/wear

- ❑ **Human-Animal Bond**
 - ❑ Fear and anxiety
 - ❑ Isolation of dog

- ❑ **Social safety**



5

Medical differentials



6

Aggression is a symptom, not a diagnosis

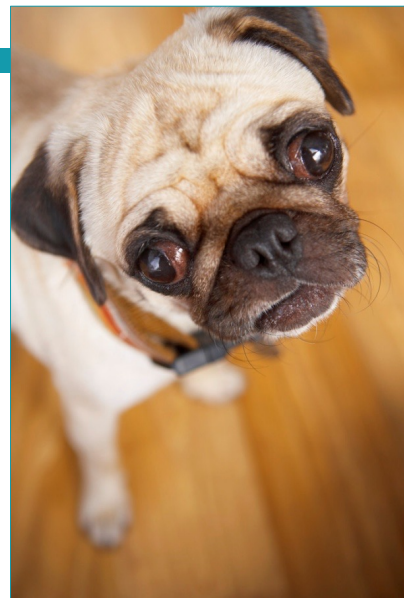


7

Medical Differentials

Anything that can cause pain, physical discomfort, confusion

- Dermatologic
- Orthopedic
- Neurologic
- Urinary
- Gastrointestinal
- Dental
- Ophthalmologic
- Anything else!



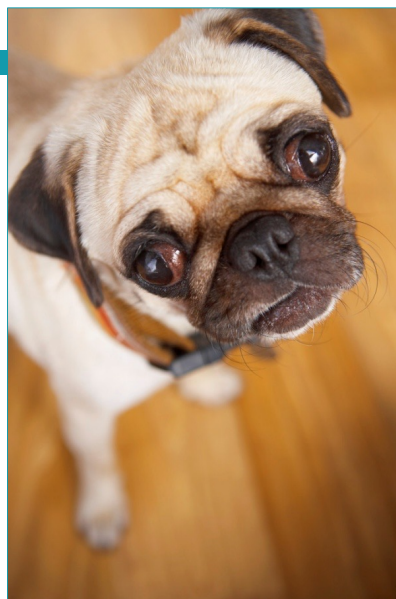
8

Medical Differentials

□ Additionally

- Endocrine
- Physiologic
- Infectious / Inflammatory
- Neoplasia

□ Remember DAMNIT scheme



9

Medical Assessment

Minimum database

- Physical examination
- CBC/Chemistry/T4/UA
- Other diagnostics depending on clinical signs



10

Diagnosing Types of Aggression

- A behavioural description of the dog's behaviour
- Who or what is the target of the behaviour
- Determine underlying motivation for the aggressive behaviour

Example:

- Fear-based aggression towards unfamiliar people on walks

11

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



12

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



13

Behavioural history



14

Behavioural History

- This is what allows for a successful behavioural assessment
- Get ahead of time if possible
- Open ended questions



15

Behavioural History

- Behavioural description
- What what does the dog DO?
 - Growling?
 - Snapping?
 - Tooth contact?



16

Behavioural History

□ Target of the aggression

- Family member (Adult? Child?)
- Family dog
- Unfamiliar people
- Unfamiliar dog
- Etc.



17

Behavioural History

□ Underlying motivation

- Body language
- Movement



18

Behavioural History

□ Context

- What are the situations in which the aggression of concern has occurred?



19

Behavioural History

□ Additional Contexts

- What are the situations in which the aggression of concern has occurred?



20

Remember Compassion

- ❑ Clients want help
- ❑ Often strong emotions
 - ❑ Anxiety and stress
 - ❑ Blame
 - ❑ Sadness
 - ❑ Anger
 - ❑ Guilt
 - ❑ Shame
- ❑ Feel trapped by their dog's behaviour



21

Remember Compassion

- ❑ 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



22

Remember Compassion

- They love their dog, even if they are the targets of aggression



23

Motivation: Body Language and Context

- Body language → See mild signs of anxiety
- Mild signs of anxiety → Early intervention
- Body language indicating stress may be prelude to a bite
 - Prevention is always better and easier than treatment



24

Body Language: Dogs

Comfortable

- Relaxed face
- Relaxed body
- Ears up or relaxed
- Tail neutral, easy wag



25



26

Body Language: Dogs

Uncomfortable

- Leaning away
- Turning away
- Whale eye
- Ears back
- Tight facial muscles
- Tail down or tucked
- Piloerection



27

Body Language: Dogs



28

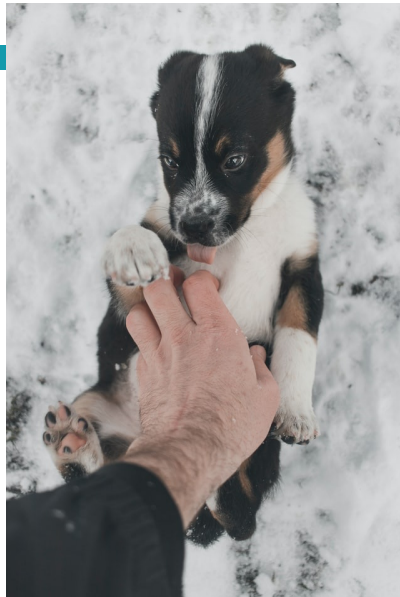
Body Language: Dogs

Uncomfortable

- Licking lips
- Yawning
- Freezing
- Avoidance
- Hiding
- Vocalize (whine, growl, bark)



29



31



32

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



33

Assessing Behaviour at the Vet Clinic

☐ Alternatives to the exam room

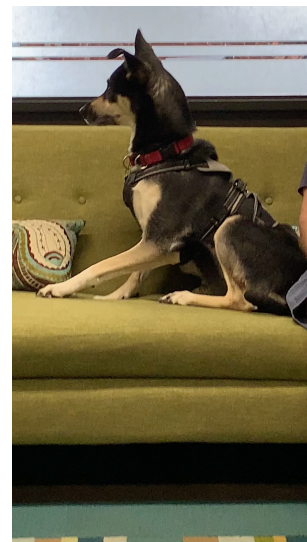
- ☐ Parking lot
- ☐ Staff meeting room



34

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.
- ☐ Reach out for help from a specialist if you need it!



35

Assessing Behaviour at the Vet Clinic

Safety precautions

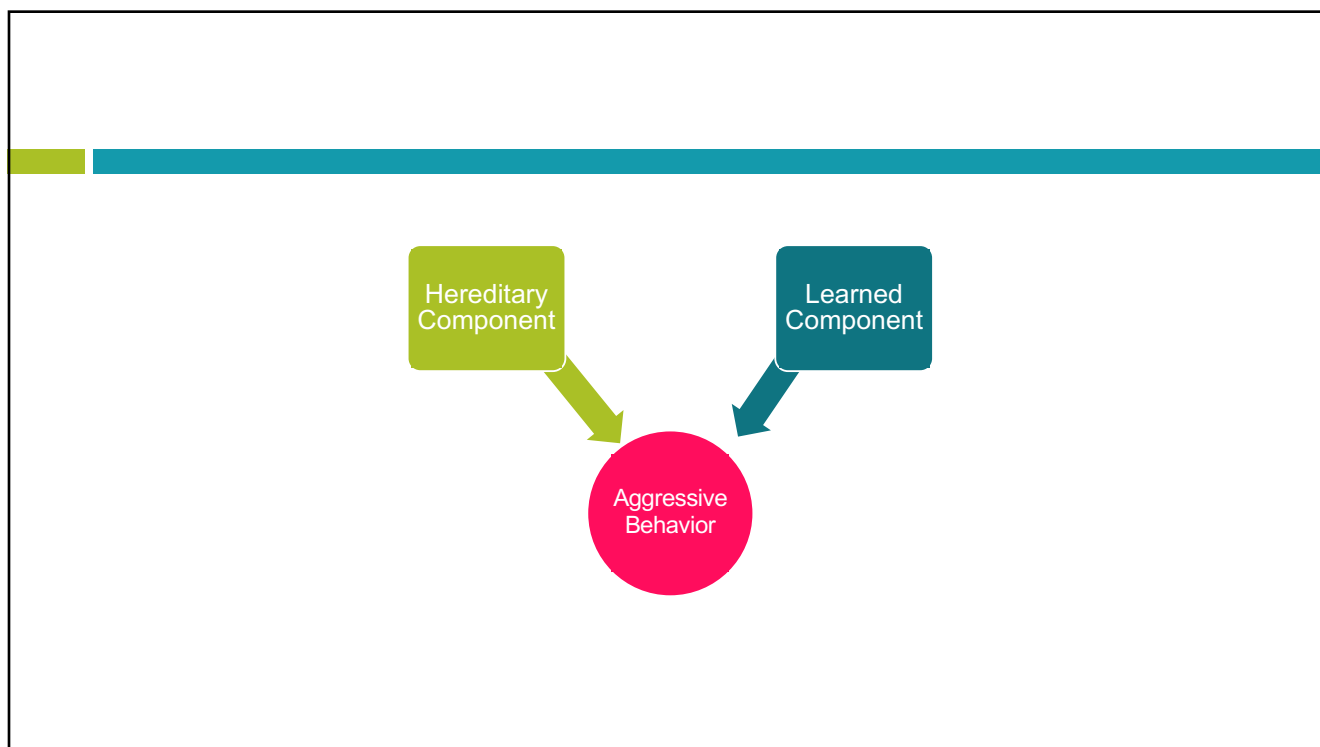
- Inform everyone of the dog
- Bring in/out minimizing triggers
- Clients place muzzle before entering if necessary

36

Diagnoses



37



38

Diagnosing Types of Aggression

1. Behavioural description
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



39

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

40

Behavioural Differentials for Aggression

Fear-Based Aggression

- ❑ Body language currently or historically indicating fear
- ❑ Context includes situations where stressful interactions are occurring between dog and target



41

Behavioural Differentials for Aggression

Fear-Based Aggression

- ❑ Often also fearful of people off property
- ❑ Body language indicating fear
- ❑ Approach/avoid behaviours
- ❑ Bark from a distance
- ❑ Approach when back is turned

Note: Fear motivated dog may look very confident



42

Behavioural Differentials for Aggression

Fear-Based Aggression

- ❑ No age, breed or sex predisposition
- ❑ NOT dominance
- ❑ Common reason aggression in the veterinary setting



43

Behavioural Differentials for Aggression

Possessive Aggression

- ❑ Dog acts aggressively when in possession of or near a valued object
 - ❑ Food
 - ❑ Chews / Toys
 - ❑ Stolen items
- ❑ Usually accompanied by body language signs of anxiety
- ❑ Can occur in young dogs
 - ❑ Sometimes considered normal
- ❑ Most common towards family members
 - ❑ If already concerned about visitors, may increase chances of this if the dog is predisposed.



44

Behavioural Differentials for Aggression

Possessive Aggression

- ❑ Freezing
- ❑ Staring
- ❑ Growling
- ❑ Snapping
- ❑ Showing teeth and/or biting when in possession of a desired object
- ❑ Chew / ingest faster
- ❑ Take item further away



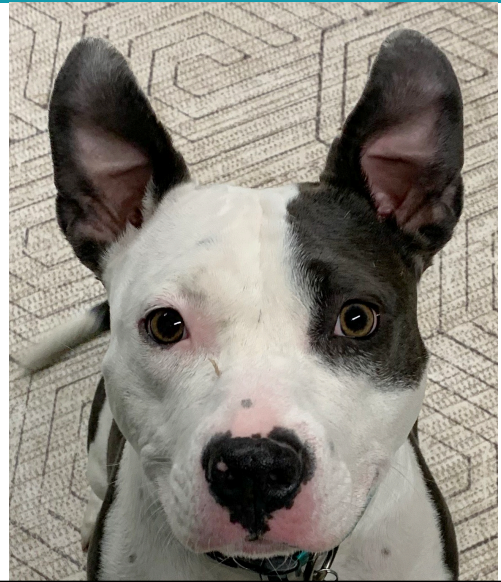
45

Behavioural Differentials for Aggression

Frustration/Arousal-Based Aggression

- Interest or playfulness
- Bark from a distance
- Piloerection
- Dilated pupils
- Rapid escalation to biting when overstimulated
- Friendly off-leash but may be inappropriate

Note: Can be difficult to determine in some cases

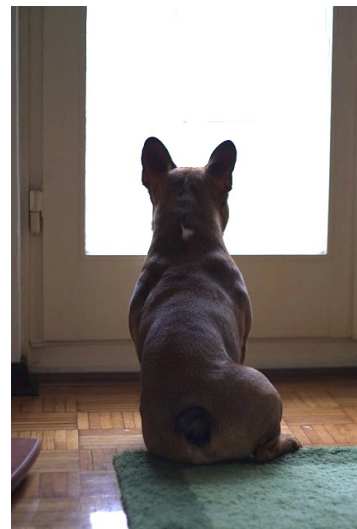


46

Behavioural Differentials for Aggression

Territorial Aggression

- Occurs in house or other areas that the dog may consider territory such as a car.
- Targets may include people or dogs



47

Behavioural Differentials for Aggression

Territorial Aggression

- ❑ Occurs
 - ❑ Door
 - ❑ Windows
 - ❑ Yard
 - ❑ Car
- ❑ May be comfortable with strangers off-territory
- ❑ Breed may predispose
- ❑ Often anxiety component
- ❑ May appear confident



48

Behavioural Differentials for Aggression

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



49

Behavioural Differentials for Aggression

Competitive Interdog Aggression

- ❑ Defense of valuable items, space or attention from another household dog

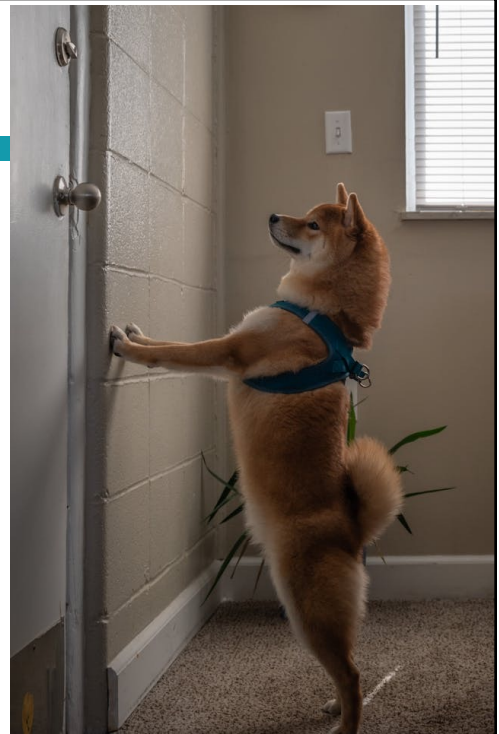


50

Behavioural Differentials for Aggression

Redirected Aggression

- ❑ Unable to reach target and exhibits aggression towards nearby target
- ❑ Generally secondary to fear or overarousal
- ❑ Can be uninhibited
- ❑ Most often seen
 - ❑ On walks
 - ❑ When visitors come to home
 - ❑ Seeing stimuli outside
 - ❑ Transitions



51

Behavioural Differentials for Aggression

Pain-Related

- Self-protective behaviour
- Often sudden without significant warning
- May develop into fear-based aggression even after pain has been treated.



52

Behavioural Differentials for Aggression

Predatory Behaviour

- Debate → aggression?
- Can be fatal
- Freezing, stalking, usually silent
- Triggered by movement, high-pitched sounds

53

Risk assessment



54

Risk Assessment

- Size of dog
- Historical aggression intensity
- Frequency



55

Risk Assessment

- Targets
- Ability to maintain safety
- Vulnerable people in contact with dog
- Prior training



56

Rehoming / Euthanasia

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



57

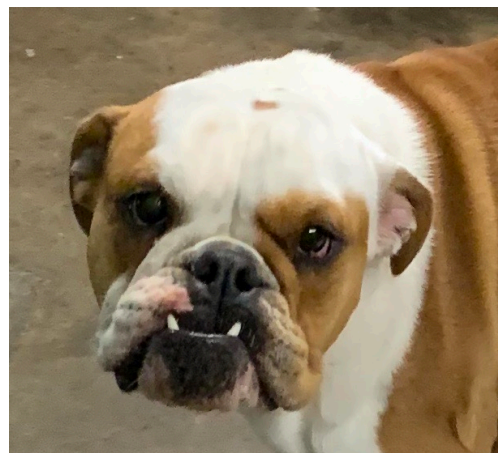
Treatment overview



58

Setting Expectations

- ❑ Bites are rarely unprovoked
 - ❑ Most bites are predicable and preventable
- ❑ 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



59

Setting Expectations

- ❑ 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
 - ❑ Rarely change in medication effectiveness alone
- ❑ Promote compassion for dog's fear or anxiety



60

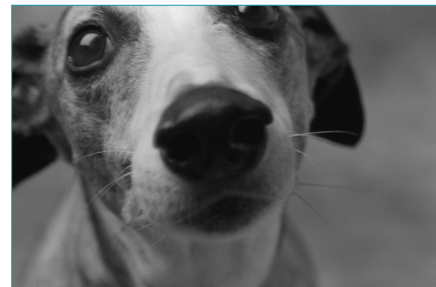
Treatment

Three components:

1. Environmental and Social Modification
2. Behaviour Modification
3. Medication and other modalities

Determine your comfort level

1. Avoidance, risk assessment and refer immediately?
2. Avoidance, risk assessment, medications, refer for behaviour modification?
3. Do it all in-house?



61

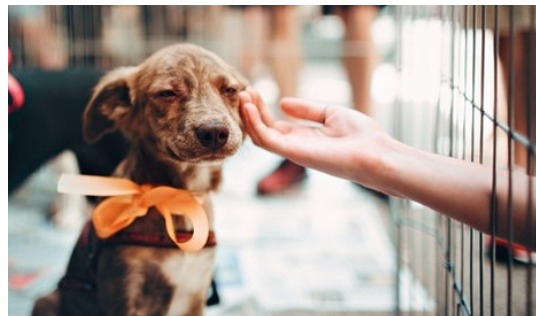
Management



62

Management

- ❑ Avoid or prevent situations that trigger aggressive behaviour
- ❑ Will depend on who the target(s) are and where the aggression is taking place



63

Management

Safety equipment / Precautions

- Muzzle in public?
- Crate in the car?
- Separate room when visitors come to the door?



64

Management Examples

- Barking / 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



65

Management Examples

Growling at visitors to the house

Pre-visit Setup

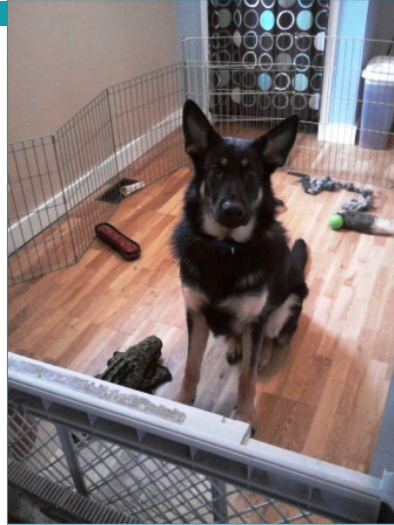
- Set up a sanctuary room
- Crate dog

Environmental Setup

- Prevent knocking/doorbell
- Visitors text/call before arrival

Equipment

- Basket muzzle
- Head halter/front-clip harness



66

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



67

Behaviour Modification



68

Why Veterinarians Need to Know

- We are caretakers of mental as well as physical health
- Clients respect our opinion, AND
- Animals are learning all the time



69

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

70

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



71

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



72

Considerations on Behaviour Modification for Aggression

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



73

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

Title of Presentation

74

Example of associative Learning



75

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

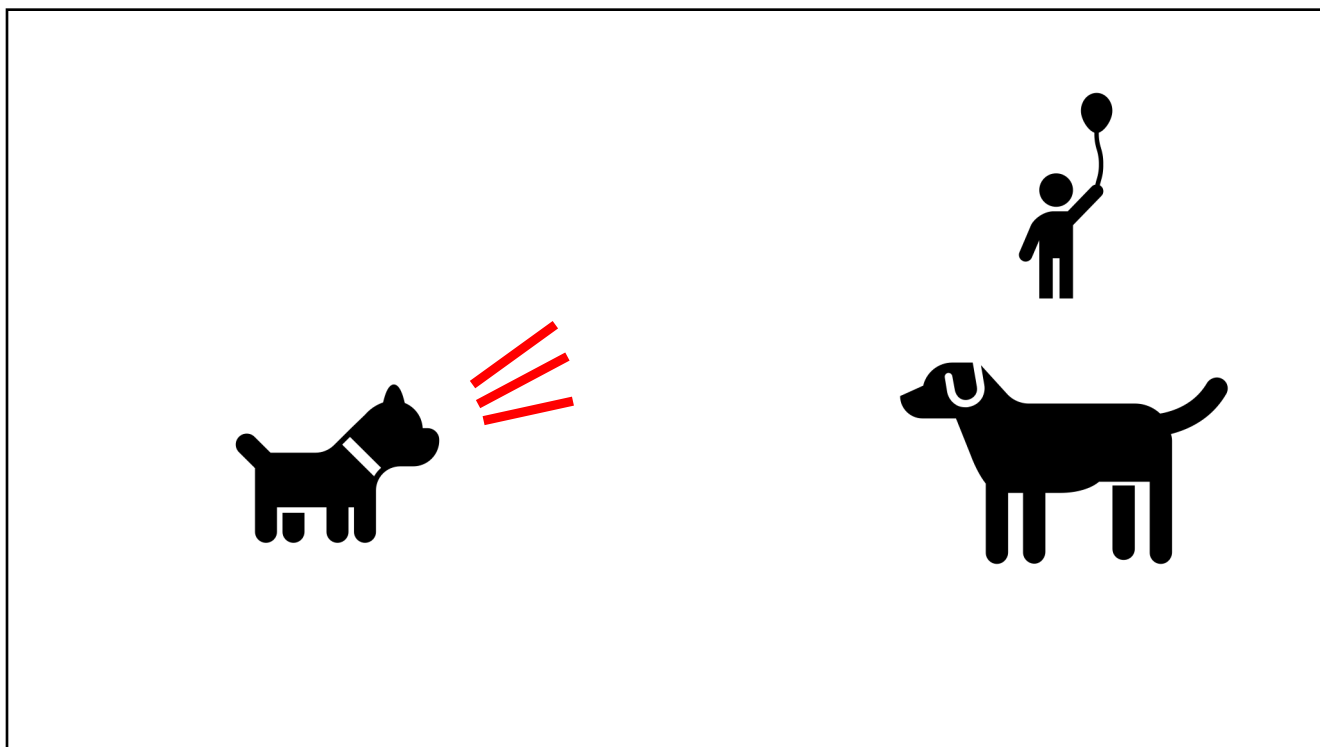
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BUT...

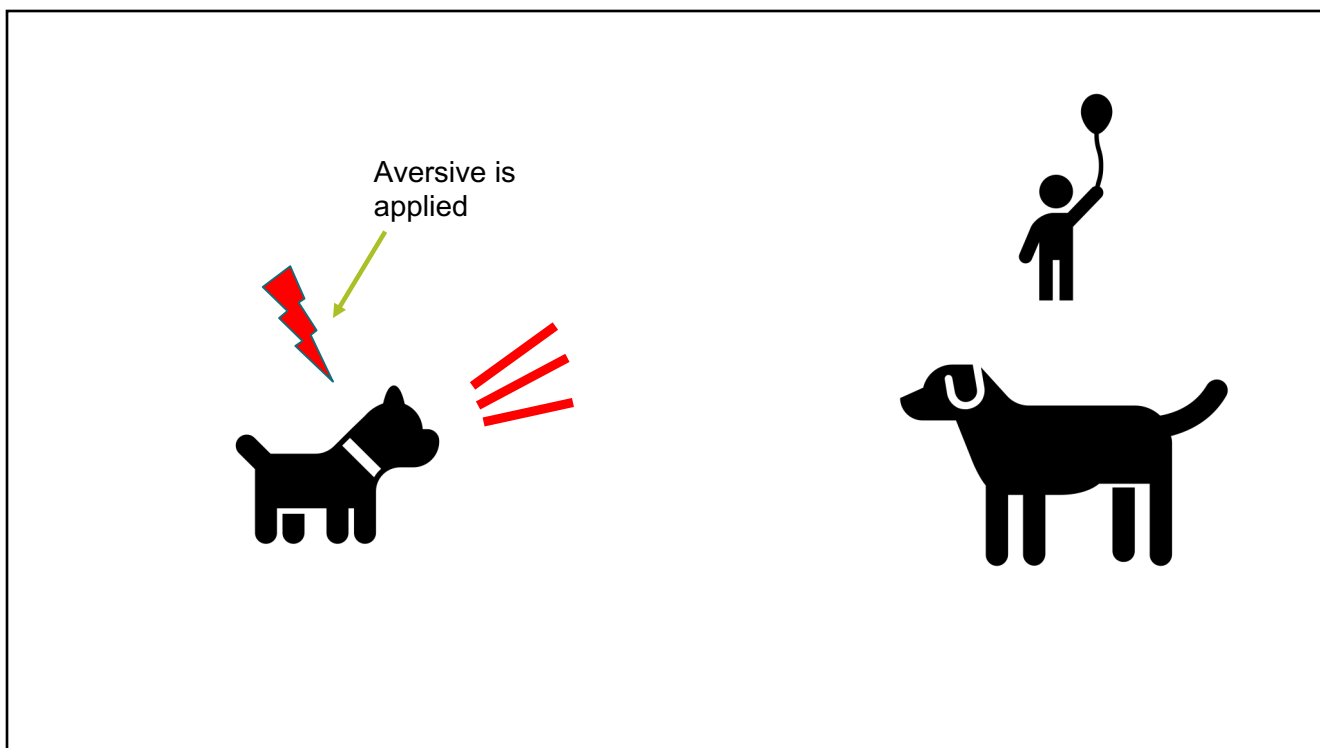
Learning doesn't happen in a vacuum!

- Associative learning ↔ consequence-based learning
- Associative learning can condition emotional responses
- This can profoundly impact the human-animal bond and animal welfare

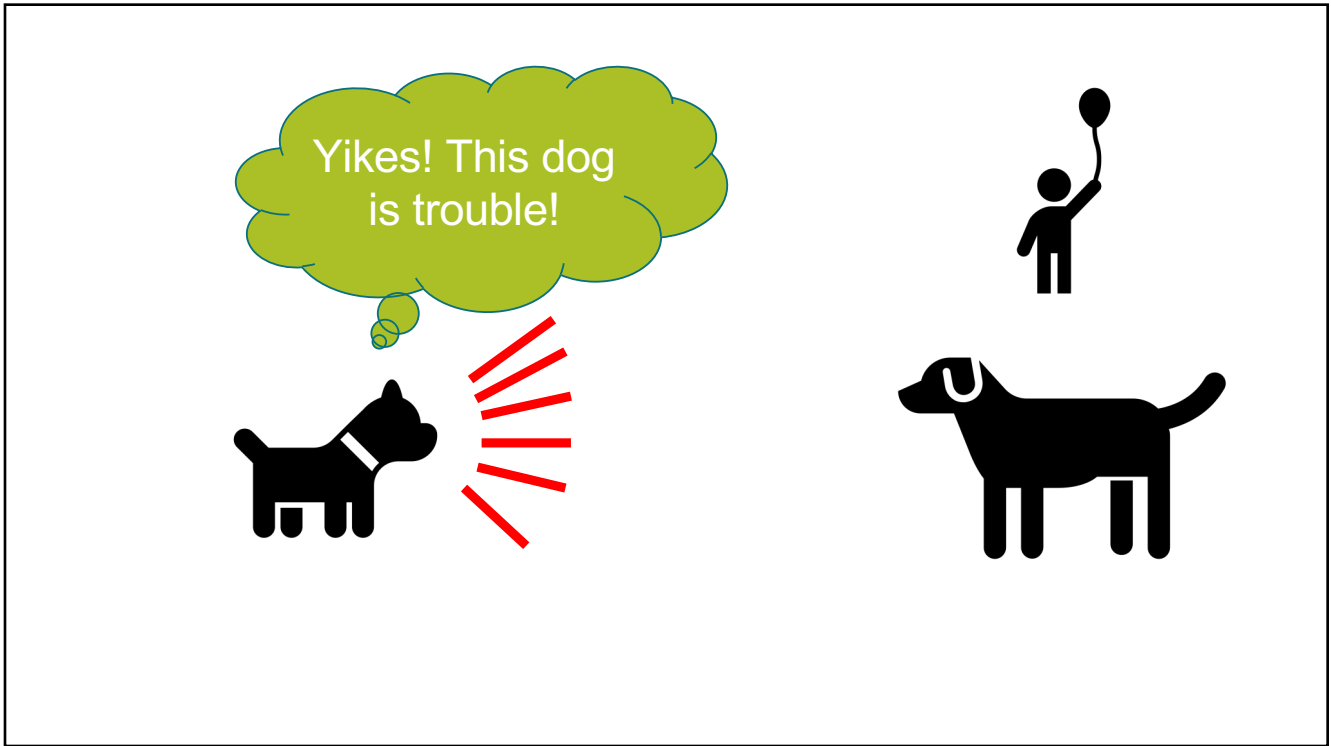
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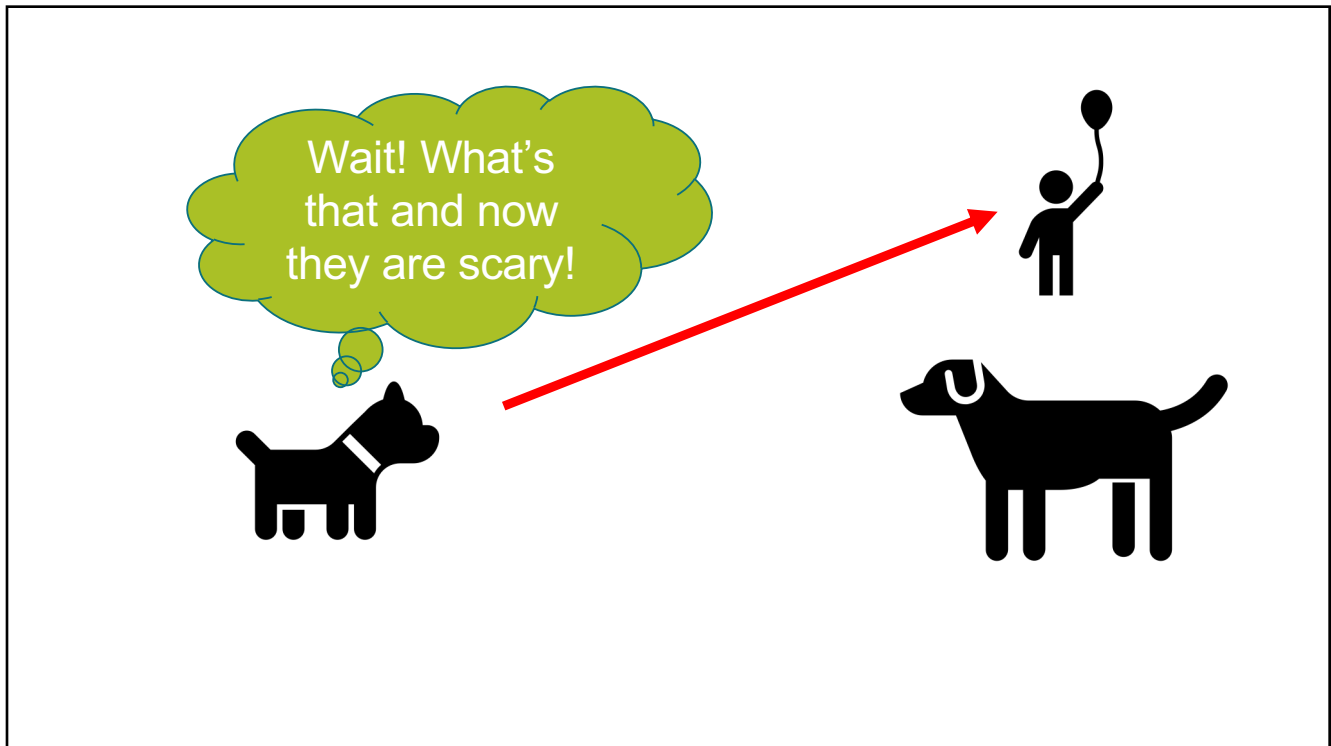
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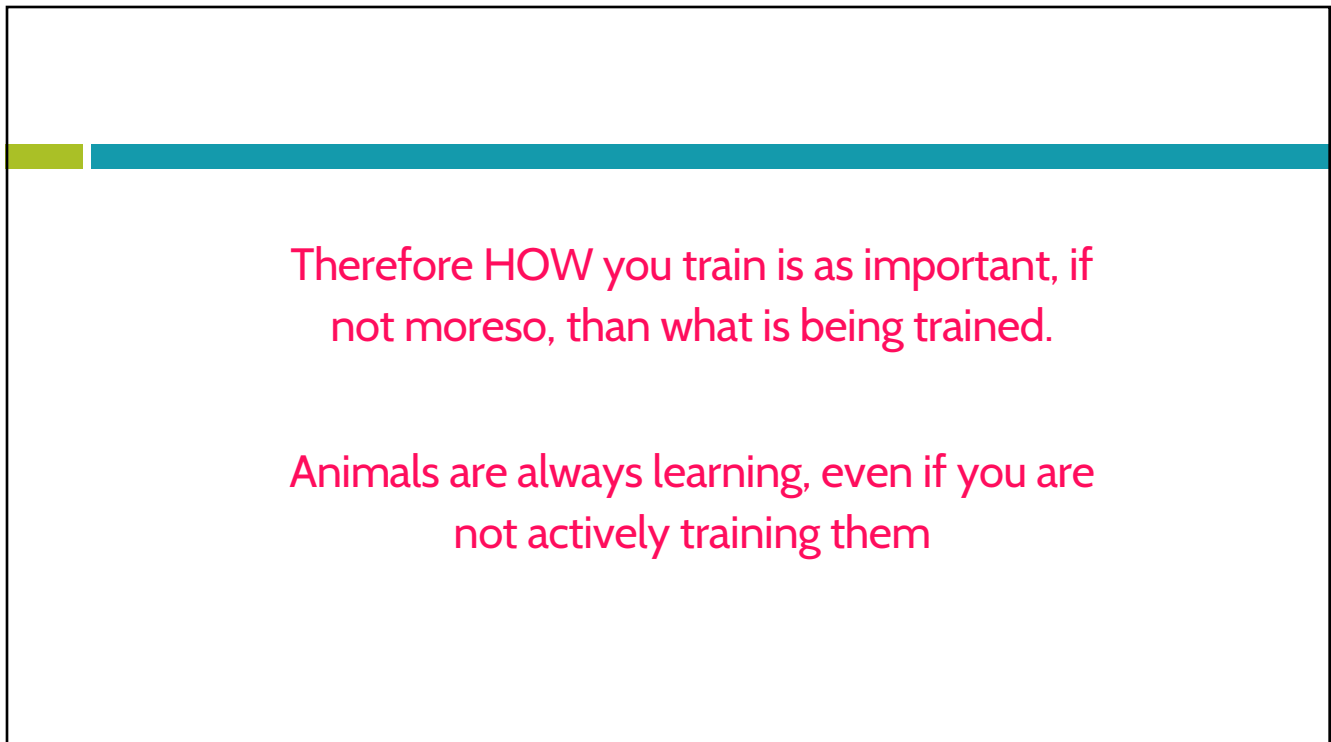
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81



82



83

Behaviour Modification

Foundation behaviours

- ❑ Done without triggers first
 - ❑ Get it Game
 - ❑ Muzzle conditioning
 - ❑ Confinement training



84

Desensitization and Counter-Conditioning

- ❑ Strong emotional component to unwanted behaviour
- ❑ Systemic gradual exposure to a stimulus in ways that does not trigger a fear/anxiety response
- ❑ Should be guided by experienced professional

85

Desensitization and Counter-Conditioning

- Goal: Change the underlying motivation of the behaviour from fear / anxiety to relaxed
- If the learner is relaxed and happy, they are less likely to exhibit the problem behaviour!

86

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



87

Desensitization and Counter-Conditioning

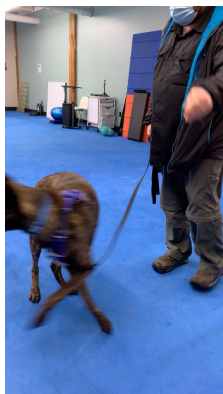
- Determine desensitization gradient
 - Easiest → Hardest
- Expose dog to the trigger in controlled way such that fear or aggression response not triggered
 - Distance is your friend
- Physical interaction is not always the goal



88

Desensitization and Counter-Conditioning

- At or over threshold
- What it should look like



89

Psychopharmacology



91

Psychopharmacology: When to Use

- ❑ 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



92

Psychopharmacology: Common 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?



93

Psychopharmacology: General Principles

Psychotropic medications can promote:

- ❑ Positive mood
- ❑ Improved focus
- ❑ Neuroplasticity



94

Psychopharmacology: General Principles

- 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



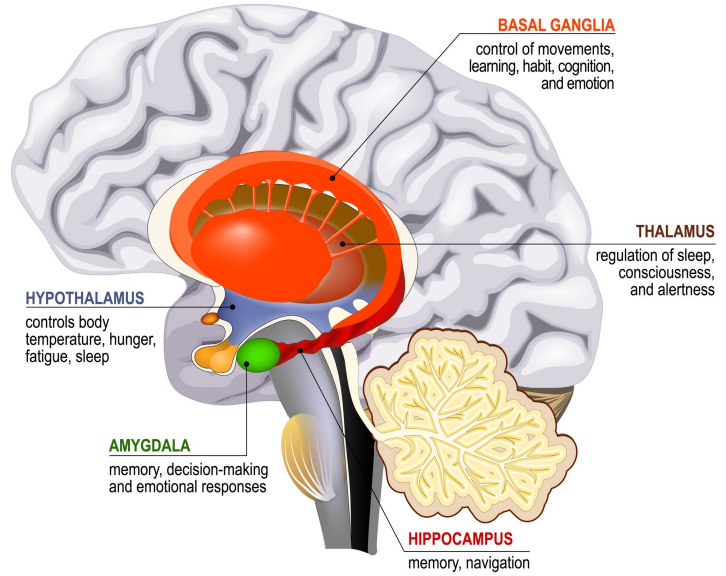
95

Psychopharmacology: Setting Expectations

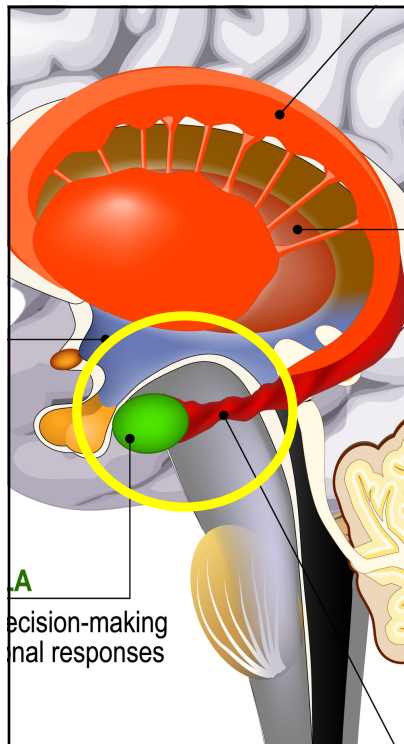
- Will not cure aggression
 - Aggression has no cure
- May not modify aggressive behaviour significantly on its own
 - Must be in combo with management / behaviour modification
 - Makes dog more receptive to the training

96

Limbic System



97



PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

Network analysis reveals abnormal functional brain circuitry in anxious dogs

Yangfeng Xu, Emma Christiaen, Sara De Witte, Qinyuan Chen, Kathelijne Peremans, Jimmy H. Saunders, Christian Vanhove, Chris Baeken

Published: March 15, 2023 • <https://doi.org/10.1371/journal.pone.0282087>

- 13 pet dogs
- Increased connectivity between areas of anxiety circuit
- Amygdala → stranger-directed fear and excitability
- Amygdala-Hippocampus + amygdala-thalamus → attention-seeking/attachment
- Frontal lobe → Chasing, aggression towards familiar dogs

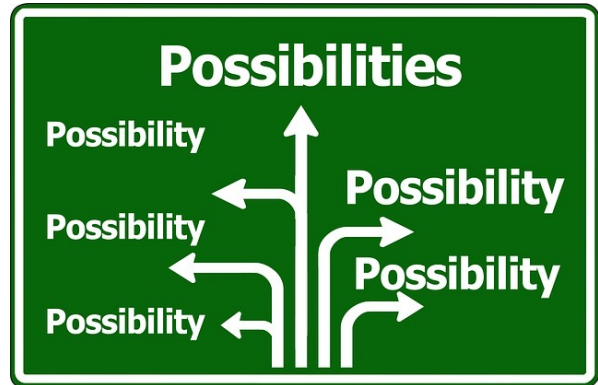


98

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

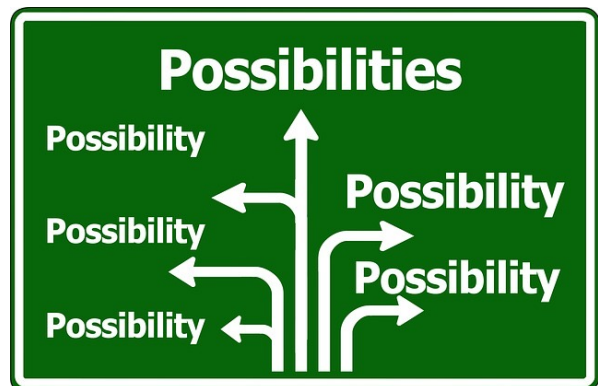
- Increase aggression?



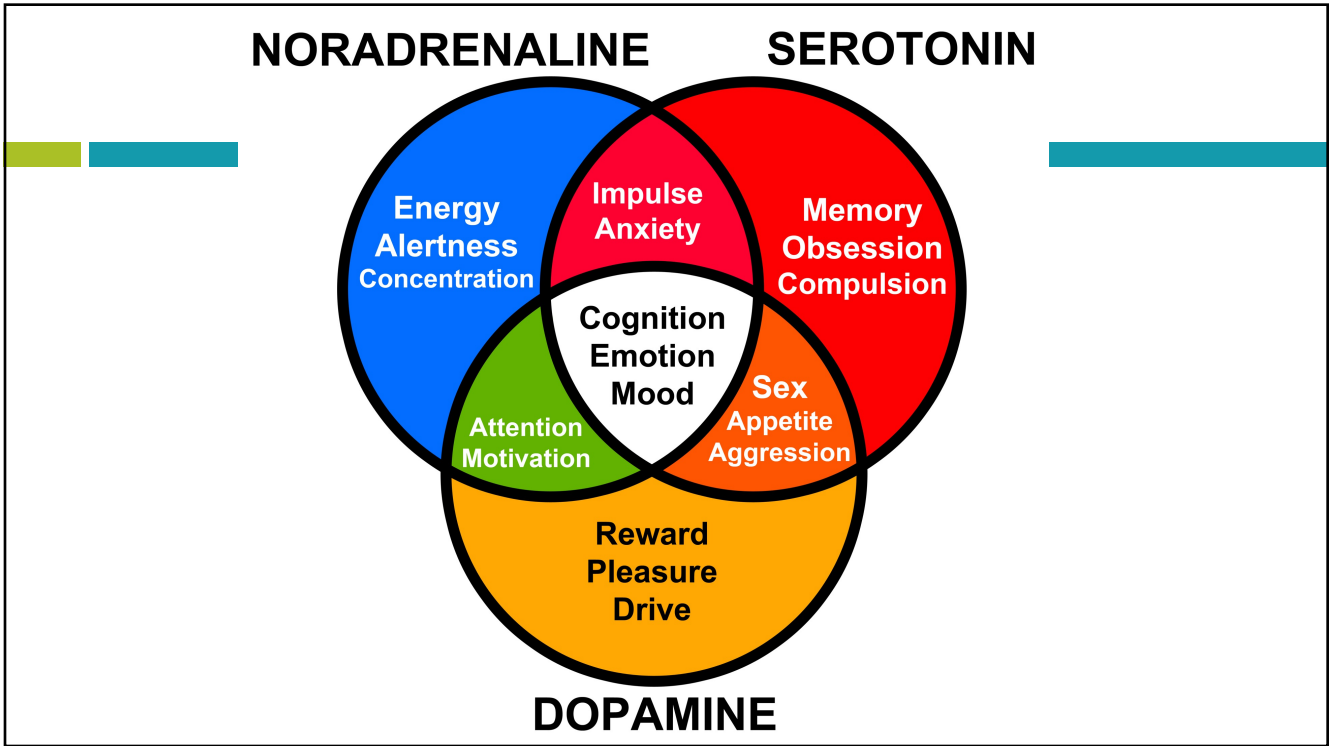
99

Quick-Acting Medications (Overview)

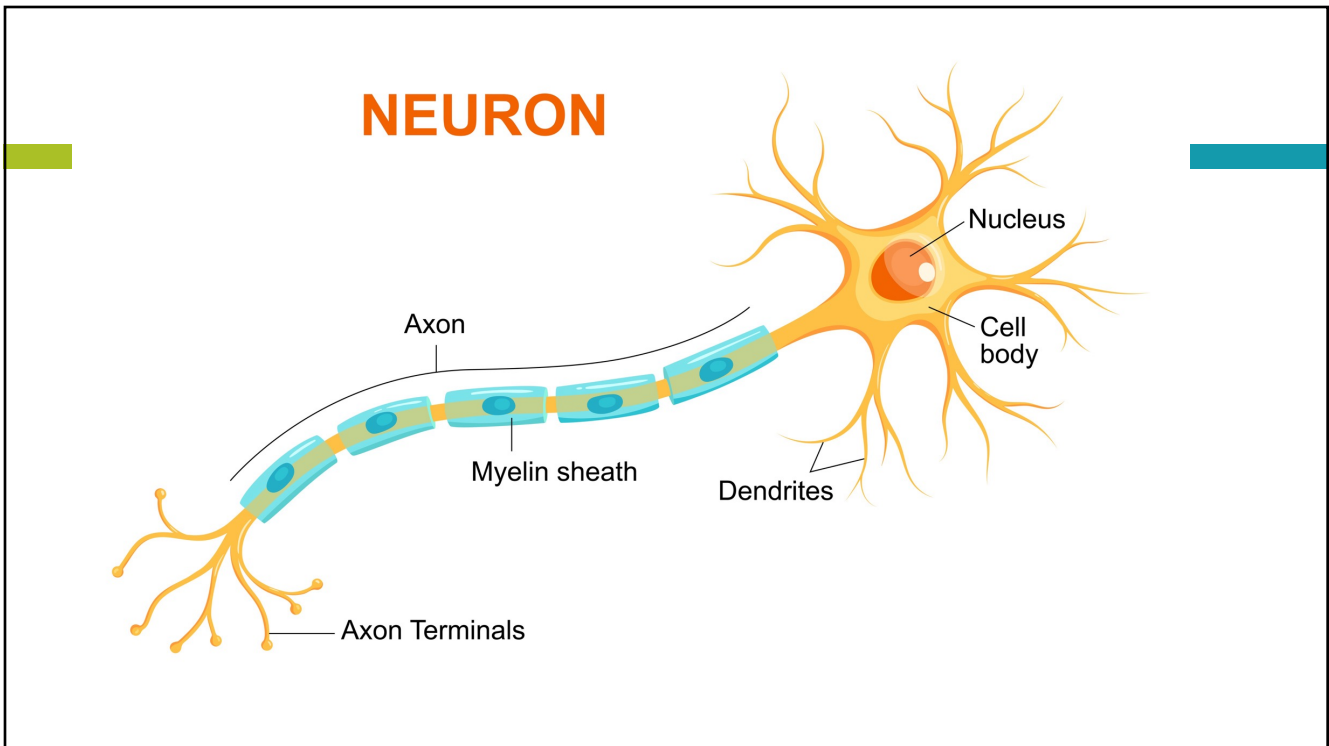
- Rapid effect (30min – 2hrs)
- Effects shorter-lasting
- May be sedating
- Can be used situationally
- Can be used as daily adjunct to mainstay medication
- Many can be used together



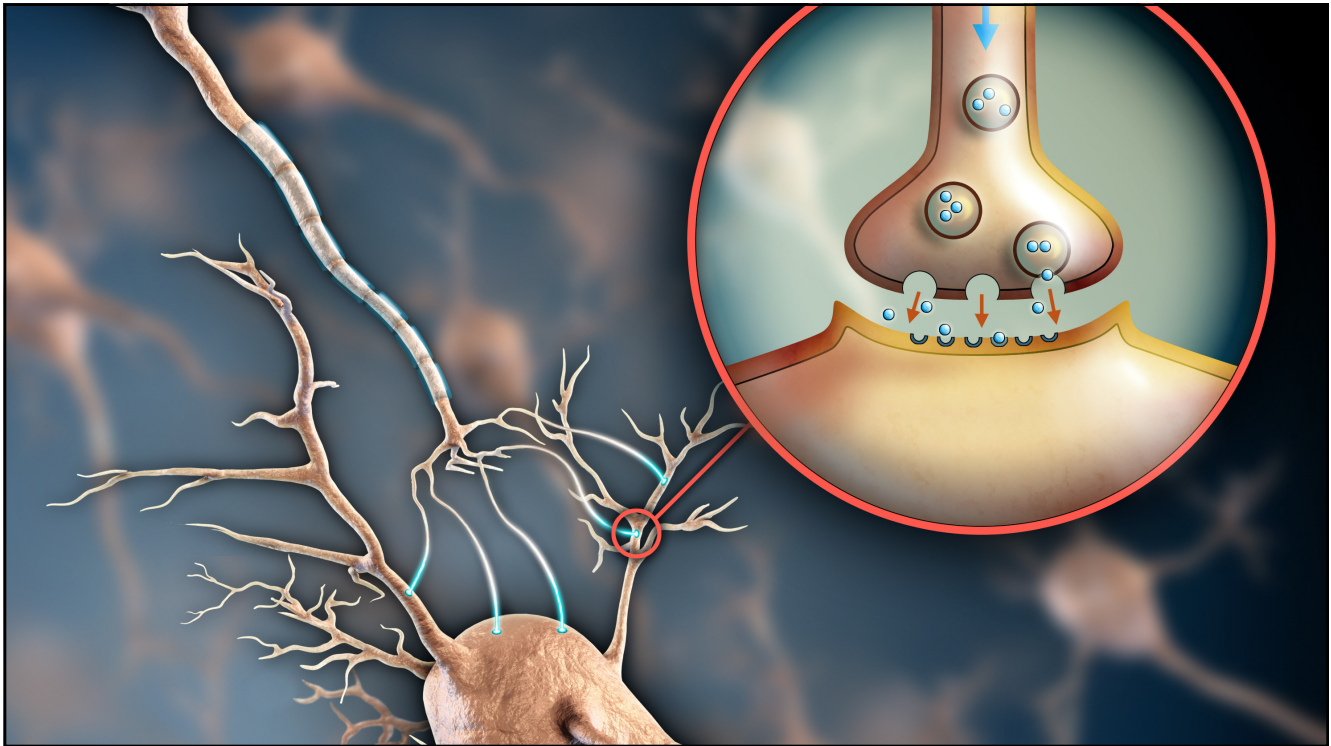
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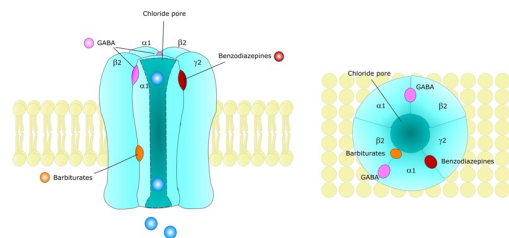
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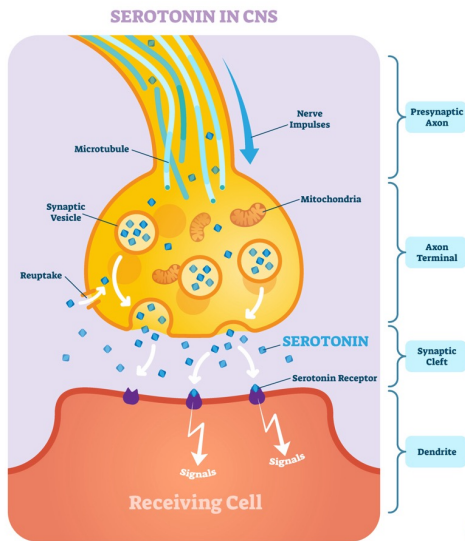
GABA

- ❑ Inhibitory
- ❑ Synthesized from glutamate
- ❑ Action:
 - ❑ Activates GABA receptors → hyperpolarizes postsynaptic cell → CALMING, decreases vigilance
- ❑ Medications that increase activity



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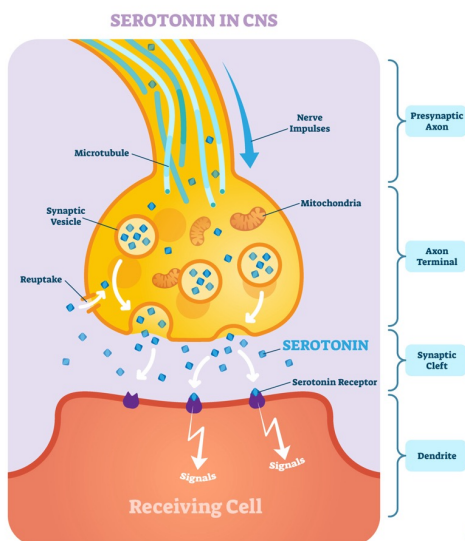
Selective Serotonin Reuptake Inhibitors (SSRIs)



- ❑ Blocks reuptake of serotonin into presynaptic cell
- ❑ Increases active serotonin
- ❑ Changes in post-synaptic receptors
 - ❑ Decreased anxiety and impulsivity

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SSRIs



- ❑ Side effects
 - ❑ Calming effect
 - ❑ Decreased appetite
- ❑ V/D uncommon
 - ❑ Warn re: increased irritability
- ❑ Caution
 - ❑ Hepatic / renal insufficiency
- ❑ Avoid
 - ❑ Narrow angle glaucoma
 - ❑ Concurrent amitraz / TCA / MAOI usage

106

fluoxetine paroxetine sertraline

Images from: Stahl's Essential Psychopharmacology: Neuroscientific Basis and Practical Applications, 4th Ed.

Examples

- Fluoxetine (Prozac[®])
- Paroxetine (Paxil[®])
- Sertraline (Zoloft[®])

107

SSRIs

Reconcile[®]

- FDA-Approved for separation anxiety in dogs + bmod
- Off-label usage common
- 1-2mg/kg per day

Reconcile.com

108

Tricyclic Antidepressants (TCAs)



- Blocks reuptake of serotonin and norepinephrine into presynaptic cell
- Changes in post-synaptic receptors
 - Decreased anxiety and impulsivity

109

TCAs



- Side effects
 - Calming effect
 - Decreased appetite
 - Dry mouth
 - Urinary retention, constipation
 - V/D uncommon
 - Warn re: increased irritability

110

TCAs



- Caution
 - Hepatic / renal insufficiency
 - Constipation
 - Urinary retention

- Avoid
 - Narrow angle glaucoma
 - Concurrent amitraz / SSRI / MAOI usage

111

TCAs



allivet.com

□ Examples:

- Clomipramine
- Amitriptyline

□ Clomicalm®

- FDA-Approved for separation anxiety in dogs in combination with bmod
- Off-label usage common
- 2-4mg/kg per day
 - BID dosing better

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Situational / Adjunct Medications

Benzodiazepines

□ Action:

- Increase activity of GABA receptors
- Schedule IV controlled drugs

□ Effects

- Quick acting (30-60min)
- May cause sedation
- Calming effect

□ Side effects

- Excessive sedation
- Polyphagia
- Paradoxical excitation
- Disinhibition of aggressive behaviour? Use Caution!

□ Examples

- Alprazolam
- Lorazepam

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Situational / Adjunct Medications

Gabapentin (10-40mg/kg up to 8hr)

□ Action

- Inhibition of voltage-sensitive Ca²⁺ 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

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Situational / Adjunct Medications

Clonidine (0.01-0.05mg/kg up to 8hr)

□ Action

- Alpha-2 Agonist

□ Effect

- Effect in ~2hrs
- General calming
- Decreases arousal

□ Side effects

- Sedation

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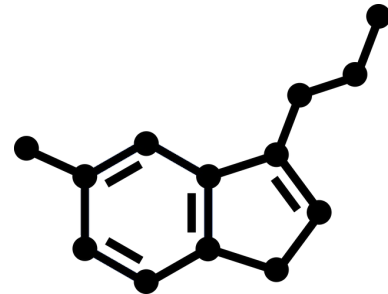
Serotonin Syndrome

Serotonin Syndrome

- Always discuss if combining products that increase serotonin

□ Signs

- Lethargy
- Agitation
- Confusion
- Vocalization
- Hyperthermia
- Coma/Death



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Tips for Medicating Dogs

- ❑ Avoid manual pilling
- ❑ Strongly flavored/smelling carrier
 - ❑ Separate from food
- ❑ Alternative options
 - ❑ Flavored tablets
 - ❑ Flavored compounded liquid
 - ❑ Hide in gelcaps
 - ❑ Transdermal?



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Other Modalities

Supplements

- ❑ Zylkene
- ❑ Composure Pro
- ❑ Calming Care Probiotic

Pheromone products

- ❑ Dog Appeasement Pheromone (DAP)
- ❑ Comfort Zone

Body Wrap (supervised only)

- ❑ Thundershirt
- ❑ Anxiety Wrap



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Conclusions



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Take-Homes



- Aggressive behaviour can be assessed in the veterinary setting
- Aggressive behaviour is treatable but not curable
- Not dominance
- Force is not needed
- Early intervention is best

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Take-Homes

- ❑ Cornerstones: Management and safety
- ❑ Decrease fear/anxiety through desensitization and counter-conditioning
- ❑ Behavioural medications can significantly improve outcome



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Thank you!

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you

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Questions?

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