Case studies: dog

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Case Study One: Rolo

- 10 month old Cockapoo
- BIOP for 8 months (bought from breeder at 8 weeks)
- Was neutered at 6 months of age
- Had shown increasing frustrations around owners with the greatest concerns mounting and thrusting on their legs prior to walks, and jumping up and grabbing them roughly during play, particularly if told ‘no’
Case Study One:
Rolo

- Fed dry food from a bowl twice daily although can be a picky eater
- Sleeps on his own bed in owner’s bedroom
- Walked twice daily in company, approx. 1 hour each walk interspersed with ball throwing.
- Intermittently soft faeces often towards end of walks
- Owners are both retired so Rolo is rarely left by himself
Case Study One: Rolo

Attempts to modify behaviour prior to consultation:

*Withdrawing attention for grabbing behaviours, seems to make him more manic, so owner has started holding him tightly and telling him no, this has resulted in Rolo running manically around the room grabbing at the owners with speed.

*Making Rolo sit and wait behind babygate in kitchen while owner gets ready for walk in porch as an attempt to stop the mounting behaviour, so far when led from the kitchen the mounting owner’s leg has worsened as a result
Case Study One: Rolo

Key concepts

*Stress and frustration – the effects of acute and chronic stress on frustration behaviours

*Long term potentiation
Stress: What is it?

Definition (Oxford English Dictionary);

1. Pressure or tension exerted on a material object
2. A state of mental, emotional or other, strain

Specific medical definition
Stress refers to the outcome of an interaction between an organism and the demands placed on it by the environment
Stress: What is it?

Physical stress vs psychological stress

Both ‘tax’ the bodies coping mechanisms by making the body work harder to stay in balance.
Stress: What is it?
Corticotrophin Releasing Factor (CRF)

Adrenocorticotropic Hormone (ACTH)

Blood stream

Adrenal cortex

Cortisol

Negative feedback = switch off
Causes of canine stress

FRUSTRATION / FRUSTRATION OF GOALS

FEAR

OVER EXCITEMENT / OVER STIMULATION
Frustration of goals

- Inelastic behaviours
- Elastic behaviours

(Marian Stamp Dawkins 1983)

*Body Care
*Ingestion
*Sleep

SAFETY

INELASTIC BEHAVIOURS = FRUSTRATION OF GOALS
SAFETY

Good bonds: attachment and socialisation history
Stable, predictable social group
Well habituated to environment
Minimal experience of punishers / other fear inducing encounters or experiences
Ingestion

Opportunistic carnivore (predominantly scavenge)
Social eating
Chewing daily
Variety in diet
(meat preference)
Body Care

- Elimination (urination / defaecation)
- Temperature regulation
- Coat care
- Touch / stroking
Sleep

10-16 hours daily (average adult 14hrs)

Polyphasic

Diurnal / mid nocturnal behaviour

Social behaviour

Requirements

- feel safe
- correct temperature
- comfort
- able to lie flat out
Overstimulation / over exercise as a cause of stress
<table>
<thead>
<tr>
<th>INCREASED</th>
<th>Adrenalin</th>
<th>Cortisol</th>
<th>Glutamate</th>
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<tbody>
<tr>
<td>DECREASED</td>
<td>GABA</td>
<td>Serotonin</td>
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Time budget domestic dog

Activities
- Inactive
- Maintenance
- Vocalize
- Affiliative
- Aggressive
- Individual

Taken from:
# Reducing stress in dogs

<table>
<thead>
<tr>
<th>Inactive</th>
<th>Maintenance</th>
<th>Vocalise</th>
<th>Affiliative</th>
<th>Individual</th>
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</thead>
<tbody>
<tr>
<td>Sleeping Resting</td>
<td>Eating</td>
<td>Bark</td>
<td>Dog-dog active interaction (play, allogroom, sniff)</td>
<td>Walk (48%)</td>
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<td></td>
<td>Toileting</td>
<td>Howl</td>
<td>Dog-human active interaction (beg, wag tail, follow, receive food)</td>
<td>Inspect</td>
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<td></td>
<td>Chewing</td>
<td>Growl</td>
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<td>Self-grooming</td>
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<td>Stand</td>
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<td>Active food scavengen</td>
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<td>Ethogram</td>
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<tr>
<td>Ethology</td>
<td>The scientific study of an individual animal species in its natural environment including its biology, physiology and evolution.</td>
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</table>
Which behaviours are we likely to offer in a given situation?

The path of least resistance
The more we practice certain activities the better we get at them

Practice makes permanent

Long term potentiation

So for Rolo – the more he practices mounting his owners, the stronger those pathways will be in his brain and this behaviour will be the easiest ‘route to take’ in times of frustration or stress as it will become ‘the path of least resistance.

Similarly – grabbing and mouthing when aroused will become a well practised behaviour and an ‘easy route to take’
Thwarting the excitable dog often leads to frustration and stress.

Punishing the dog for these behaviours causes two issues

1. Increased stress chemicals as the result of fear and frustration from punishment

2. Punishing a dog for offering the behaviour means the dog has already ‘walked the unwanted pathway’ which results in some further long term potentiation.

How can we stop the behaviours without unintentionally reinforcing them and without using punishment?
RECOGNISE

CHANGE SET UP

DISTRACT

SET UP ALTERNATIVE, DESIREABLE BUT ACHIEVABLE BEHAVIOUR
Calmness and exhaustion are NOT the same thing.

A tired body is not necessarily a calm mind.

- Increased dopamine
- Increased adrenalin
- Increased cortisol
- Low blood sugar

Elevated cortisol has been shown to increase behavioural reactivity, even when the cause of increased cortisol is not linked to the stimulus triggering reactivity. Boissy, A., Veissier, I. and Roussel, S., 2001. Behavioural reactivity affected by chronic stress. *ANIMAL WELFARE-POTTERS BAR*-, 10, pp.S175-S186.
The problem with fast ‘play’

*Increased arousal chemicals in the brain and body

This can be part of the undesirable process of ‘trigger stacking’ or sensitisation

‘ADRENALISED: activities or events that frighten or thrill with the result an elevation in adrenalin’

*Long term potentiation / strengthening of unwanted pathways eg predatory chase, barking, frustration/ fear behaviours

*Lowered body glucose – using up glucose in fast exercise, reduces the amount available to the ‘PREFrontAL CORTEX’ the area of a mammal’s forebrain than regulates the response from areas such as the limbic system.
Treat search

Food scatter
*SNIFFARI’s  Slow, dog led walks, where sniffing and exploring are the goal

*Back pack walks  Calm, dog led walks where the owner takes a back pack containing a blanket, some objects to sniff, a chew and a book to read (Thanks to Steve Mann for this concept)

*Natural obstacle course walks  Calm walks where the owner seeks out opportunities for the dog to be rewarded for offering exploration with their paws
Case Study One: Rolo

Key concepts
* Stress and frustration
  - Meet his inelastic needs (avoid punishment, provide reassurance and appropriate social contact, social eating, variety, chewing, toilet needs)
    - Replace most fast exercise with calm stimulation
    - Avoid ‘making him wait’

* Long term potentiation
  - Practice the alternative
Ready to walk: search for treats on floor of porch
Time of fast play: have scatter treats available, edible chews
Case Study Two: Ben

- 4 year old Spaniel cross neutered male
- BIOP since 8 weeks old
- Was neutered at 6 months of age
- Has marked reaction to noises outside the house such as car doors shutting, sirens, gun shots, fireworks.
- Reactive to owners leaving him (barks excessively and occasionally howling)
Case Study Two: Ben

- Fed dry food from a bowl twice daily although can be a picky eater
- Sleeps in the utility room on a floor dog bed
- Walked twice daily in company, approx. 1 hour each walk interspersed with ball throwing.
- Female owner does not work. Male owner 9-5 Mon-Fri
- Have purchased a puppy approximately 3 months ago, both dogs get on ok but Ben will growl at Odi during play and play is therefore limited. Odi sleeps in a crate in the kitchen away from Ben.
Case Study Two: Ben

During the history taking section the owner also revealed:

- Thinks dog is a grumpy, introverted personality
- Often refuses to walk home on last 10 minutes of walk – will sit or lie down and refuse to get up
- Washing and towelling feet results in growling

Physical examination revealed a reluctance to turn head to the right compared to the left. Otherwise, NAD.
Case Study Two: Ben

Key concepts

*Sleep
*Long term potentiation
*Possible pain
Sleep & behaviour modification

* Memory consolidation
* Homeostasis of serotonin
* Regulation of brain electricity
* Reduction in cortisol levels
* Development of immune system
* Enhanced tissue repair
* ’Safe’ experience of potential outcomes prepares brain for future possibilities
SLEEP DEPRIVATION

With specific respect to ‘reactivity’ it has been demonstrated that individuals experiencing a single nights sleep deprivation exhibit exaggerated amygdala reactivity to negative stimuli.

(Reference Yoo et al 2007)

Chronic sleep deprivation has been shown to decrease the parasympathetic control that follows ‘flight or fight’ system activation, and increases HPA axis activity resulting in more emotional reactivity and more behavioural reactivity to potentially stressful events (Reference Rosales-Lagarde 2012)
Sleep in the domestic dog

What is normal for sleep as a behaviour in the dog?

* Polyphasic
* Predominantly nocturnal but includes up to 40% sleep diurnal
* 10-14 hours in every 24 hours
* As much as 50% REM sleep in total amount (average adult dog 20%)
* Social
* Preference for warmth and elevation
* Need to lie flat out to achieve quality REM sleep
Improving Ben’s sleep

*Social; baby gate between utility and kitchen
*Safety; undisturbed, quiet room, radio on in day
*Elevated; old sofa bed into utility
*Able to lie flat out; assess size of available beds
*Temperature; turn up radiator, insulate windows
*Choice
Long term potentiation

- Avoiding separations
  - female owner walk Ben while male owner leaves for walk
  - Not to leave Ben without human company – female owner able to stay with / keep Ben with her 24/7

- Avoid ‘sudden noise situations’ where possible eg postman / deliveries

- Distract, then reassure Ben at times of reactivity to noise
Pain

How does pain affect behaviour problems?

- Contributes to ‘unwanted’ behaviours such as aggression, OCD’s, even separation anxiety by increasing stress pathways that heighten self defence mechanisms.


- Stress worsens the perception of pain, address causes of stress in the dog’s life and improve their pain.

- Prevents / limits new learning: pain causes stress, pain makes it hard to focus.
Acute vs chronic?
The right words?

**Adaptive pain** – helps to protect currently injured tissues and maintain overall homeostasis

**Maladaptive pain** – is doing little to help any existing injured tissue and is affecting the bodies overall homeostasis eg fitness. Hypersensitivity to pain is a common feature.
Acute vs chronic?
The right words?

Features of chronic / maladaptive pain

‘Wind up’ ~ heightened sensitivity resulting in altered pain thresholds both peripherally and centrally

Allodynia – pain resulting from a stimulus that does not normally cause pain eg light skin touch

Hyperaesthesia – more pain felt than is normal for the stimulus
TREATING PAIN

PAIN RELIEVING MEDICATIONS

COMPLEMENTARY THERAPIES

SLEEP

REDUCE CHRONIC STRESS

INCREASE SEROTONIN
Was Ben in pain?
How do we diagnose pain in the difficult to examine patient?

- Clinical examination including detailed history taking and gait assessment / hands on assessment
- Response to pain medication trial (pros / cons) (consider neuropathic pain vs somatic pain, consider conditioned responses may not extinguish quickly, consider pain relief rarely removes all pain)
- Further diagnostic tests eg radiographs, thermography, scintigraphy. CT, MRI
*Ben responded positively to initial pain medication (NSAIDs) – increased energy, stopped ‘stopping’ on walks, more neck flexibility on examination.

*Further investigations included radiographs then referral for CT and MRI of the neck

*Diagnosis:

Bulging disc causing spinal cord compression at c3/c4 and mineralisation of disc c4/c5.

*Treatment: ongoing NSAID treatment with physiotherapy and acupuncture.
Case study Two: Ben

*After 6 weeks on NSAID and 2 months of improving sleep, avoiding long term potentiation, o reported:

- no longer an introverted character!
- Playing for up to hours a day with the younger dog, not breaking away or growling
- No sound reactivity
- Able to be left in utility with view of Odi and no response to owners separation
- All without any counter conditioning
Case study Three: Jonny and Judy

- Jonny – a 3 year old Terrier cross neutered male
- In foster care as relinquished by owner 6 months previously for biting owner when put into crate
- Had been neutered at 8 months of age
- Presenting problem was tail chasing which had always done since in foster care, no history from previous owner
- Had snapped at current carers a few times mostly when put into crate or occasionally when being bathed
Case study Three: Jonny and Judy

- Spent night time in kennel in foster carers garden, kennel has a crate with a bed which Jonny is shut in from approximately 8pm until 6am. The kennel is then a covered area of approx. 1.5m x 2m long which Jonny spends a few hours in in the day time with free access to the crate as a bed area.
- Taken for a walk around carer’s 1 acre paddock 6am with ball chasing exercise.
- Has breakfast with carer and 3 other dogs, dry food with some meat. Then kennel until 1pm.
- Afternoon is spent around carers house and garden with a few other dogs, a walk around the paddock with ball chasing again around 5pm, then dinner about 6pm, kennel til 8pm then let out in garden before put into crate.
Compulsive disorders in the dog

“Canine compulsive disorders are time consuming, repetitive behaviours derived from a species typical behaviour considered maladaptive and a manifestation of uncontrollable stress” Schenider et al 2009 Journal of Vet Behaviour

- Abnormal behaviours not seen in the normal ethogram
- Considered a sign of previous or existing poor welfare
- ‘Coping’ strategies for ongoing stress sometimes including disease
- Considered in human medicine to indicate imbalance of certain neurotransmitters or brain electricity
Causes of tail chasing / spinning

- Genetic factors
- Pain (tail fractures / trauma / anal gland disease)
- Partial seizures
- Neurotransmitter abnormalities such as Glutamate over activity / Serotonin under activity

Frustration of goals

- Inelastic behaviours
- Elastic behaviours
  (Marian Stamp Dawkins 1983)

*Body Care
*Ingestion
*Sleep

SAFETY

**INELASTIC BEHAVIOURES** = **FRUSTRATION OF GOALS**
Why it matters ......

BEHAVIOURS UNDERTAKEN BY THE BODY
HELP MAINTAIN NORMAL NEUROTRANSMITTER HOMEOSTASIS (BALANCE)
Ethogram

A species specific list of all the behaviours normal to that species in its natural habitat

*BUILDING BLOCKS THROUGH ADEQUATE DIET

*UPTAKE ACROSS BLOOD BRAIN BARRIER REQUIRES HEALTHY BODY / DIGESTION / BALANCED DIET

*USAGE AND REPAIR THROUGH ACTING OUT INELASTIC BEHAVIOURS
Core behaviours suggested to balance neurotransmitters

* Eating (building blocks AND activity/ enjoyment of eating)
* Thermoregulation
* Skin care (scratching, grooming, stroking, touch)
* Sleep
* Dealing with stress / control over avoiding fears
* Certain muscular activities: stretching / playing
Case study Three: Jonny

*Jonny was found to have pain on examination of the lower part of his tail. Radiographs revealed a nonhealing fracture.

*Amputation of the distal tail was the most likely treatment to allow resolution of the pain.

*Dogs with CD need careful consideration for surgical treatments as wounds frequently become a site for future CD focus.

*Started pain relief (NSAID – beware GUS in some CD cases)
*Started SSRI (sertraline) as effects take 4-6 weeks in many cases
*Careful operation planning regards pre op stress reduction and post op wound management.
*Op delayed for approx. 2 months until alternative foster care available
Case study Three: Jonny

*Avoid confinement.
   Initially – access to kennel and crate instead of shutting in crate at night.
   Immediately preop – change foster carers where access to house and garden available and no over night crating (indoor pen with elevated sleep area in bedroom with 2 other dogs and new carer)

*Avoid LTP. Find a distractor and maintain for a number of minutes, such as search for treats, edible chew etc.

*Post op dressings – light weight, had to use Elizabethan collar but allowed play, exploration and chew time without collar while monitored daily. 10 days.

*Use essential oil smell to ‘overshadow’ wound scent, on dressings and then on hair around wound after EC removal

*Post operative pain relief. NSAIDs / paracetamol.
  Trazodone.
  Gabapentin
  Continued SSRIs
Case Study Three: Judy

- 9 month old GSD entire bitch
- BIOP 5 months – rehomed from local rescue centre. No history but was tail chasing within 24 hours of arrival
- Tail chasing occurred a minimum of 10-15 times throughout her awake periods, although sleeping both in day and at night was poor – easily disturbed, would bark, pace and occasionally tail chase
- Multi dog house hold. Would play and interact nicely with other dogs
- Dry diet twice daily.
- Lots of outdoor time as owner has a large yard and fields attached.
Resolution of Compulsive Disorders – if CD’s are part of coping strategies, should we be aiming for 100% reduction?

*Owner education about ‘jigsaw puzzle’ including inability to cope with stress. That CD’s are attempts by the individual to feel better, CD prevention may well increase stress.

*Glutamate antagonists / NMDA agonists
*GABA agonists
*SSRIs

Seizure control or genetic imbalance? (James FMK et al 2017 Journal of veterinary internal medicine 31(5) )

*Removal / limiting pain and other disease

The aim would be for the individual to offer the CD less often as they experience less stress and have alternative ‘adaptive’ coping strategies.
Two day seminar

Taught in English with consecutive translations into Dutch and French

Held in Brussels, Belgium.

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