Stress and Behavior Assessment

- True personality traits may be difficult to assess in the shelter due to the effects of stress on personality/temperament.
Stress

- Reduces welfare
- Increases disease susceptibility
- Increases likelihood of behavior problem development
- Many behavior problems are rooted in stress/conflict issues
Stress and Behavior

Before an attempt at an accurate behavior assessment test can be performed, stress MUST be assessed and managed.
I PROMISE, I’LL MAKE THIS NEXT SECTION AS PAINLESS AS POSSIBLE!!
Stressful Stimuli Cause Activation of Major Physiologic Pathways

- Sympathetic Nervous System
- Hypothalamic Pituitary Adrenal Axis
Hypothalamus

Spinal cord

Direct epinephrine, norepinephrine secretion

Adrenal glands

Indirect norepinephrine, epinephrine secretion

Sympathetic Nervous System
Fight or Flight Response

- Sudden stress, fright, fear, or pain $\rightarrow$ massive sympathetic discharge
- Epinephrine (Adrenaline!) and norepinephrine mobilize body resources for critical circumstances
- The choice of fight vs. flight depends upon:
  - Genetics
  - Underlying stress level
  - Past experiences
SNS Activation Causes
‘Classic’ Signs of Arousal

- Mydriasis (dilated pupils!)
- Tense muscles/ trembling
- Tachycardia (elevated heart rate)
- Piloerection (hair standing on end)
- Tachypnea (rapid breathing)
- Ptyalism (excessive salivation)

2.5 yr Pit Bull
Questions?

I’m good!

Question!!
Hypothalamic Pituitary Adrenal Axis

- Hypothalamus
  - CRF
  - ACTH
  - Adrenal Glands
  - Cortisol
Cortisol- 'the Stress Hormone’

- Mobilizes energy resources
- Reduces inflammation
- Provides feedback to the brain
Stress ‘Markers’

- Cortisol measurement/response to challenge
- Blood glucose
- Heart rate
- Blood pressure
- Respiratory rate
- Galvanic skin response
- Activity?
- Others….
Stress and Disease

- Stress weakens immune system function
  - Increased disease susceptibility
  - Poor recovery from disease
Factors That Cause Stress

- Medical problems (acute vs. chronic)
- Physical trauma
- Infection
- Intense heat/cold
- Restraint, immobilization
Factors that Cause Stress

- Confined living conditions
- Separation from ‘family’
- Environmental change
- Noise
- Proximity to other stressed animals
Factors that Cause Stress

- People walking by the kennel, but not stopping
- Training
- Transport
- +/- Diet change
Confinement in a new environment frequently causes a drastic change in a pet’s behavior and an increase in stress/anxiety.
Behavior and cortisol levels of dogs in shelters—predictive of problem behavior after adoption?


- Developed a test to assess puppy/dog response to novel/threatening situations
- Test was poorly predictive of problems in a home
Plasma cortisol levels at a county animal shelter

Hennessy, 1996, Physiology and Behavior
Effect of a program of human interaction on stress of dogs in an animal shelter


- Interaction included 3 min exploration, 10 minute petting/soothing words, 7 min training
- Dogs assessed with stressful test at week 0 and 8
- Regular human interaction reduced stress levels upon challenge
Stress Evaluation

- Behavioral observations
- Behavior history
- Physical examination
Behavioral Signs of Stress

- Destructive behavior
- Hides in back of cage
- Inappetence
- Increased aggression/fear
- Decreased aggression (behavioral inhibition)
- Vocalization

8 yr. Mn Terrier mix
Behavioral Signs of Stress

- Sleeps in unusual locations (litter box with cats)
- May appear normal, but ‘quiet’
- Urination/defecation
- Repetitive behavior
- Displacement behavior

2 yr. male German Shepherd Dog
Most common body posture of a stressed shelter cat?
Acute vs. Chronic Stress

- Stress is adaptive
- Acute stress—important behaviorally
  - Important to acknowledge that stress affects behavior
- Chronic stress—important from a welfare standpoint
Additive Effects of Stress

- Exposure to multiple stressors decreases coping abilities, increases likelihood of problems (medical/behavioral)
Herd/Group Stress Evaluation

- Noise/barking
- Incidence of disease/behavior problems in environment
- Cleanliness/sanitation of environment
- Single vs. group housing
Questions?

I’m good!

Question!!
ENRICHMENT
Wellness Defined

Wellness = Physical Health + Behavioral (Emotional) Health
Enrichment

- Value of enrichment (for a shelter and for an individual pet) is related to:
  - Cat’s (or dog’s) stress level
  - Cat’s behavioral history
  - Cat’s motivation
  - Cost of enrichment (time and money)
Instituting an Enrichment Plan

- **Evaluate Stress**
  - Stress MUST be reduced before cats will utilize the enrichment plan

- **Start with the basics**
  - Housing
  - Olfaction
  - Scratching surface

Add on ‘problem specific’ interventions
- Quiet time
- Feeding enrichment
Instituting an enrichment plan

- Implement ONE enrichment tool at a time
- Track progress: success, failure, modifications (if needed)
- Start with an easy enrichment tool
  - Low cost
  - Able to implement by use of volunteers
  - High probability of improving canine welfare
Instituting an Enrichment Plan

- Evaluate Stress
  - Stress MUST be reduced before dogs will utilize the enrichment plan

- Start with the basics
  - Housing
  - Olfaction
  - Scratching surface

- Add on ‘problem specific’ interventions
  - Quiet time
  - Feeding enrichment
Effective Enrichment

- Efficient
- Reduces undesirable behaviors
- Cost- inexpensive and durable
- Enrichment device should not increase the spread of infectious disease
Types of Environmental Enrichment

Feeding enhancement
Sensory stimulation
Occupational tasks
Physical alteration
Positive reinforcement training
Social
Important CAT factors to look at evaluating behavioral health...

- Appetite
- Water Intake
- Disease
- Play
- Grooming
- Repetitive behaviors

- Nail maintenance (scratching)
- Affiliative/friendly behavior
- Movement
- Behavior problems
- Urination/Defecation
Important ENVIRONMENTAL factors to look at when evaluating behavioral health (for cats)...

- Space (dimensions of enclosure)
- Noise
- Exposure to dogs
- Access to perch/hiding place
- Light/Dark
- Contact with humans
- Contact with other cats
- Mental enrichment
Herd Health

- Success in reducing stress depends upon:
  - Number of pets/number of caretakers
    - Population/Herd management
    - Volunteer programs
  - Budget
  - Facilities
  - Creativity
What is the best way to reduce shelter pets’ stress?
Questions?

I’m good!

Question!!
Methods of Enrichment - Physical Alterations

- **Goal** - create a ‘natural’ environment
  - No research available to prove value as enrichment device
- Bed or blankets
- Crate (with blankets in it)
- Short walks to prevent urination/defecation in cage
- Separation of eating, sleeping, defecation areas
Kennel Modifications
Kennel Modifications
Shelter Cat Housing in England
Cat Housing
Influence of environmental change on shelter dogs

Wells and Hepper, 1999, Applied Animal Behaviour Science

Dogs spent significantly more time in front of cage in social stimulation and bed conditions.
Influence of environmental change, continued...

- **Significantly more dogs adopted during environmental manipulations**

- **Bar graph** showing:
  - Number of adoptions on the y-axis
  - Categories: social stimulation, bed (front), toy, control
  - The social stimulation category shows the highest number of adoptions compared to other categories.
Housing

- Provide a hiding place and an elevated resting area
  - Hide, Perch, and Go™ (Cosmic Pet Products)
  - Even better- caging systems with separate compartments for elimination area vs. resting vs. eating area
  - Feral cat dens or cat shelves
Methods of Enrichment - Social Setting

- Human interaction
- Conspecific interaction
Dogs and cats are social species

- In general, group housing is preferred (when PLANNED) with long term housing
- Stress caused by introduction may outweigh the benefits of social enrichment
- Avoid overcrowding
- Make individual decisions!!
Monitor group housing*

*Slide created by Dr Kate Hurley
Influence of visual contact on shelter dogs


- Dogs allowed to see other dogs spent more time in the front of the cage
- No increase in vocalization, activity
Don’t overcrowd*

*Slide created by Dr Kate Hurley
Questions?

I’m good!

Question!!
Methods of Enrichment- Sensory Stimulation

- **Sensory stimulation** - visual, smell, tactile, auditory, taste
- **Visual stimulation** - consider...include outdoor visual access, direct sunlight, regular light/dark cycles
**Sensory Enrichment**

- **Music**
  - Classical music → calming effect
  - Heavy metal music → excitatory effect

- **Olfactory stimulation**
  - Lavender, chamomile → calming
  - Peppermint, rosemary → excitatory

Influence of auditory stimulation on dogs in an animal shelter
Wells and Hepper, 2002, Animal Welfare
Olfaction

- Pheromones

- ‘Pleasant’ environment smells
  - Grass/Potting soil
  - Small animal scents (rodents)
  - Human scent
    - One study found that cats’ favorite toy was a USED hair ‘scrunchy’

- Avoid unpleasant smells
  - Harsh cleaners
  - Dogs
Scratching Post/Surface

- Scratching is an important maintenance and communication behavior for cats
  - Cardboard scratchers
  - Carpet remnants from carpet stores which can be hung on cage and sent home with cats
  - Flat rectangular carpet surfaces which attach to cage door
‘Nosework’ for dogs

- Scent work is physically AND mentally tiring for dogs and doesn’t require a lot of room
- ‘Find it’ game
  - Train dog to find ball or other items which you hide in play area
- Tracking
Sources of pheromones in dogs and cats

- Facial glands
- Pedal complex
- Perianal complex
- Genital complex
- Mammary complex
- Urine and feces
Pheromones

- Pheromones are received and perceived by the vomeronasal organ (VNO)
- Gape (cat) and Tonguing (dog) are signs that the pet is aspirating scent into the VNO
- Allow conspecifics to transmit highly specific information
Feline Pheromones

- **F3: Feliway®**
  - Feline facial pheromone transmitted by rubbing
  - Antagonist of urine marking and scratching
  - May help cats to distinguish ‘known’ from ‘unknown’

- **F4: Felifriend® (not available in the U.S.)**
  - Feline facial pheromone transmitted by rubbing
  - Allomarking
  - Decreases the probability of aggression between the cat and the marked individual
F3: Feliway

- Studies have demonstrated that Feliway may:
  - Reduce or eliminate urine marking
    - Antagonism between facial and urine marking
    - Reduces anxiety
  - Decrease transport/environmental change stress
    - Cats exposed to Feliway eat more quickly than controls, when in a novel environment
    - Cats exposed to Feliway demonstrate less stress than controls during car transport
Canine Pheromone

- DAP (Dog Appeasing Pheromone)
  - Synthetic pheromonal analog of appeasing pheromone secreted by nursing bitches
    - Appeasines: may have a comforting soothing action on puppies and adults
  - May reduce:
    - Separation distress/anxiety
Methods of Enrichment—Occupational Tasks

- Tasks that make the animal “think”
- Used primarily with non-human primates
- Studies suggest that giving captive animals the ability to control their environment in small ways can improve their welfare
Quiet Time/Real Life Room

- Create area(s) where volunteers/staff members can take pets (especially long term residents and older pets) for calm, quiet, and relaxation
- Separate areas for dogs and dogs
- Quiet time, CALM interactions with fearful cats... CRUCIAL!
Provide Adequate Exercise
‘RETRIEVE’

- Retrieving is teaching pet to SHARE, instead of teaching them to steal toys so that you chase him/her around the house
- An easy way to reduce energy
- Best time to teach retrieve is during first 6-14 weeks of life
Training

- Reduces behavioral deterioration
- May increase likelihood of adoption
Questions?

I’m good!

Question!!
Individual Enrichment Programs

- **Fearful Cats**
  - Relaxation programs
    - Volunteers enter enclosure and sit with cat and read to it or sit quietly
      - Avoid eye contact, sudden movements

- **Active or Overweight Cats**
  - Food Dispensing Toys
    - Cats must be taught how to use them
    - Volunteers can make toys (empty yogurt containers with holes cut into sides, or empty plastic water bottles with narrow end cut off)
    - Must closely monitor food intake
Questions?

I’m good!

Question!!