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Strategies to Supporting Working Dogs During Crises

Zenithson Ng, DVM, MS, DABVP (Canine/Feline)
 Clinical Associate Professor
 University of Tennessee
 College of Veterinary Medicine

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Objectives

- Identify the specific factors in crisis that may induce short-term stress in dogs
- Appreciate the way in which these factors may impact canine welfare and wellbeing
- Utilize strategies to mitigate stress-inducing factors
- Anticipate the potential long-term impact of crisis interventions on dogs

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Crisis



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VolunTOLD...



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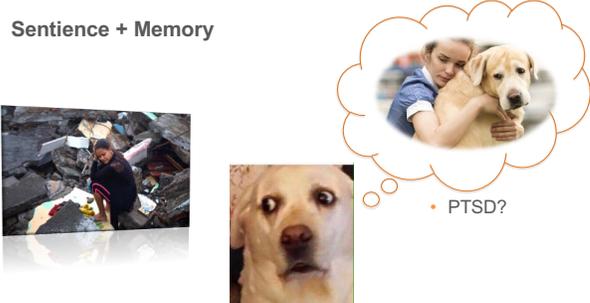
Sentient beings



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Sentience + Memory



- PTSD?

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Goal: Make them love their jobs

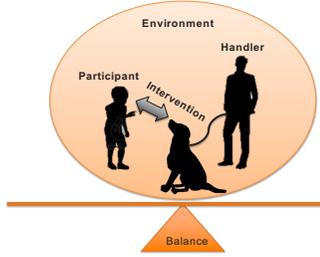


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Consider the factors:

- Environment
- Participant/Population
- The actual intervention
- Handler



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Environment

- Weather
- Precipitation
- Temperature
- Air quality
- Winds



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Environment

- Floor surfaces
- Malodors
- Chemicals
- Parasites
- Other infectious disease



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Environment

- Distractions and overstimulation
- Visual
 - Other dogs/animals
 - Lights
 - Novel large machinery/instruments
- Auditory
 - Sirens/alarms

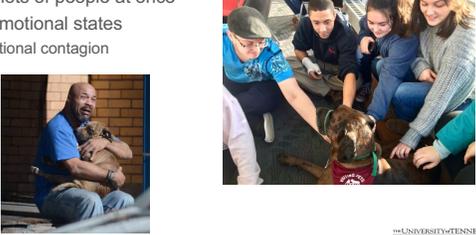


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Participant/Population

- Often, lots of people at once
- High emotional states
 - Emotional contagion



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Dogs are impacted by human emotional state

- Custance, D., & Mayer, J. (2012). Empathic-like responding by domestic dogs (*Canis familiaris*) to distress in humans: an exploratory study. *Animal cognition*, 15(5), 851-859.
 - In response to stranger crying, dogs sniffed, nuzzled, and licked the individual



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Dogs are impacted by human emotional state

- Yong, M. H., & Ruffman, T. (2014). Emotional contagion: Dogs and humans show a similar physiological response to human infant crying. *Behavioural processes*, 108, 155-165.
 - Elevated cortisol levels in response to crying



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Dogs are impacted by human emotional state

- D'Aniello, B., Semin, G. R., Alterisio, A., Aria, M., & Scandurra, A. (2018). Interspecies transmission of emotional information via chemosignals: from humans to dogs (*Canis lupus familiaris*). *Animal cognition*, 21(1), 67-78.
- Dogs can distinguish between fear and happy human odors
 - Fear sweat induced more stress behavior
 - Fear sweat increased heart rate



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Intervention

- Consider the level of intensity/engagement



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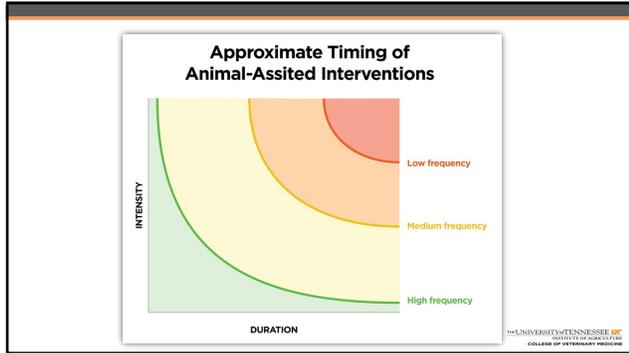
Intervention

- Utilize the animal's natural and spontaneous behaviors
- Permit animal's freedom of choice
- Control "dose" of AAI



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Handler

- The actual volunteer!

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Handler

- Synchrony of emotions

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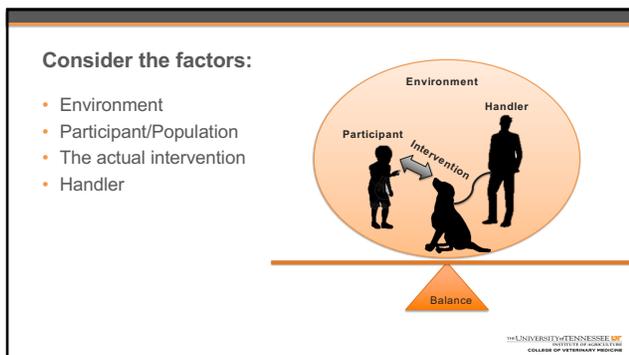
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Handler

- Katayama, M., Kubo, T., Yamakawa, T., Fujiwara, K., Nomoto, K., Ikeda, K., ... & Kikusui, T. (2019). Emotional contagion from humans to dogs is facilitated by duration of ownership. *Frontiers in Psychology*, 1678.
 - Heart rate variability correlates between owner and dog
 - Stronger in females
 - Longer duration of ownership
 - Living in the same environment

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AAI studies in dogs: Behavior

- Increase in stress-associated behavior
 - Higher in children than adults (Marinelli, 2009)
 - Increase in frequency of behavioral signs of stress after a 2 hour therapy session (King, et al., 2011)
 - Lip licking and body shaking most commonly observed (Glenk et al., 2014)
- No increase
 - Absence of observed stress behavior in dogs during AAA/AAT (Ferrara, Natoli, & Fantini, 2004)
 - No difference compared to home or novel settings (Ng et al., 2014)
 - No high stress behaviors in dogs in children's hospital (McCullough et al., 2017)

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AAI studies in dogs: Cortisol

- Elevation
 - Levels were significantly higher on days of therapy compared to control days (Haubenhofer & Kirchengast, 2006)
 - Significant elevation between start of and one hour after a therapy session (King et al., 2011)
- No elevation
 - No increase in experienced or in-training AAI dogs over one hour (Glenk et al., 2013)
 - No difference between AAA and home settings (Ng et al., 2014)
 - No difference between baseline and 20 minutes after intervention in children's hospital therapy dogs (McCullough et al., 2017)

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Crisis: Unpredictable

- Make the experience predictable/familiar as possible
 - Pheromones
 - Using specific treats/toys/rewards
- Provide for needs (water, urination/defecation, breaks)
- Utilize natural and spontaneous behaviors (personality)
- Freedom of choice – "consent"

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Points of "Consent": Before

- Cues to going to work
 - Bandana
 - Specific leash/harness

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Points of "Consent": During

- Anticipate the scenarios that may incite stress or discomfort
 - Avoid
- Monitor for stress signaling
- Offer breaks as needed

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After: Positive reinforcement

- Favorite activity
- Treats
- Any other forms of "release"

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Monitoring after

- Changes in behavior
- Changes in stool quality or frequency

Nestlé PURINA

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Long-term Impact?

Do these fleeting, intermittent activities have long-term consequences?

PTSD?

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Overall health of working dogs: 9/11 dogs

- Slensky, K. A., Drobatz, K. J., Downend, A. B., & Otto, C. M. (2004). Deployment morbidity among search-and-rescue dogs used after the September 11, 2001, terrorist attacks. *J Am Vet Med Assoc*, 225(6), 868-873.
- 96 dogs deployed at WTC and Pentagon
- Morbidity rates:
 - Gastrointestinal tract signs (5 events/1,000 dog search hours)
 - Cuts and abrasions mostly on the feet (5 events/1,000 dog search hours)
 - Fatigue (6 events/1,000 dog search hours)
 - Change in appetite (6 events/1,000 dog search hours)
 - Dehydration (5 events/1,000 dog search hours)
 - Respiratory tract problems (2 events/1,000 dog search hours)
 - Heat exhaustion (2 events/1,000 dog search hours)
 - Orthopedic or back problems (2 events/1,000 dog search hours)

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Overall health of working dogs: 9/11 dogs

- Comparison of deployed dogs (n=55) vs non-deployed dogs (n=97)
- What is the health impact of service on these animals?
 - Deployed dogs: higher globulin, bilirubin, ALP (but still within normal limits)
 - Higher antigen or toxin exposure
 - Higher incidence of radiographic cardiac abnormalities

Otto, C. M., Downend, A. B., Serpell, J. A., Ziemer, L. S., & Saunders, H. M. (2004). Medical and behavioral surveillance of dogs deployed to the World Trade Center and the Pentagon from October 2001 to June 2002. *J Am Vet Med Assoc*, 225(6), 861-867.

Otto, C. M., Downend, A. B., Moore, G. E., Daggy, J. K., Ranivand, D. L., Reetz, J. A., & Fitzgerald, S. D. (2010). Medical surveillance of search dogs deployed to the World Trade Center and Pentagon: 2001-2006. *J Environ Health*, 73(2), 12-21.



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Working life: health

- Guide dogs (UK) 1994-2013: 7686
 - 6465/7686 (84%) reached retirement (old age) by 8.5 years
 - Shorter in German Shepherds
 - 1362/7686 (16%) withdrawn health reasons
 - Musculoskeletal (arthritis)
 - Nervous/sensory (epilepsy)
 - Skin (atopic dermatitis)
 - General health deterioration



Caron-Lormier, G., England, G. C. W., Green, M. J., & Asher, L. (2016). Using the incidence and impact of health conditions in guide dogs to investigate healthy ageing in working dogs. *Veterinary Journal*, 207, 124-130.

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Working life: Life span?

- 116 guide dogs followed from geriatric examination at 8-10 years old
- 48 golden retrievers; 27 Labrador
- Median survival time of 4.4 years from geriatric exam
- Shorter time to death
 - Increased ALT
 - Skin nodules
 - Not being a Labrador retriever

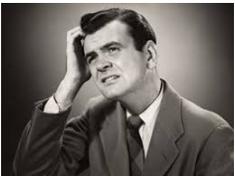


Hoummady, S., Hua, J., Muller, C., Pouchelon, J. L., Blondot, M., Gilbert, C., & Desquilbet, L. (2016). Investigation of risk factors for mortality in aged guide dogs: A retrospective cohort study. *Prev Vet Med*, 132, 125-129.

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Retirement: When is the right time?

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Ideal

- BEFORE the animal declines significantly so they can enjoy retirement in GOOD health



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QoL Scale

- Sociability
- Enthusiasm for work
- Playfulness
- Energy level
- Rest
- Mobility
- Appetite
- Predictable eliminations
- Obedience
- Minimal displays of stress

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Enthusiasm The animal is eager to get up, seeks attention, and plays eagerly with people under routine circumstances					
Discontentment The animal has been observed to bark, whine, whimper, or display any other form of discontent					
Playfulness The animal spontaneously engages in play when permitted					
Energy level The animal exhibits an appropriate level of energy for the activity under consideration					
Rest The animal sleeps with ease and appears alert and well when awakened					
Mobility The animal walks, runs, jumps, rises, and lies down with ease					
Appetite The animal has a regular and consistent appetite					
Predictable eliminations The animal defecates and urinates when expected without accidents or incontinence					
Obedience The animal responds to commands immediately and consistently					
Minimal displays of stress The animal does not exhibit signs of stress (e.g., excessive panting, pacing, yawning, clenching, shaking, or any other form of stress-related behavior)					
Total score					
Mean score					
Minimum possible score	0	2.5	5	7.5	10
Maximum possible score					

Ng ZY & Fine AH. Considerations for the Retirement of Therapy Animals. *Animals*. 2019; 9(12):1100.

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Physiology – hair cortisol

- Cortisol as a marker of the hypothalamic-pituitary axis
 - STRESS
- Reflects “unbound” cortisol in circulation
- Accumulates from vascular supply of hair follicle
- Proposed to represent basal cortisol levels
- Chronic stress
- Validated ELISA



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Welfare hypotheses

- Freedom of choice correlates to positive welfare state
- Altruism correlates to positive welfare state
- Positive welfare state correlates with healthier, longer lives



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Thank you!

- Questions?



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