

Equine Assisted Therapy for PTSD: Clinical and Neuroimaging Evidence HETI 2021

Yuval Neria PhD

Columbia University Medical Center, NY

ny126@cumc.columbia.edu

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NIMH

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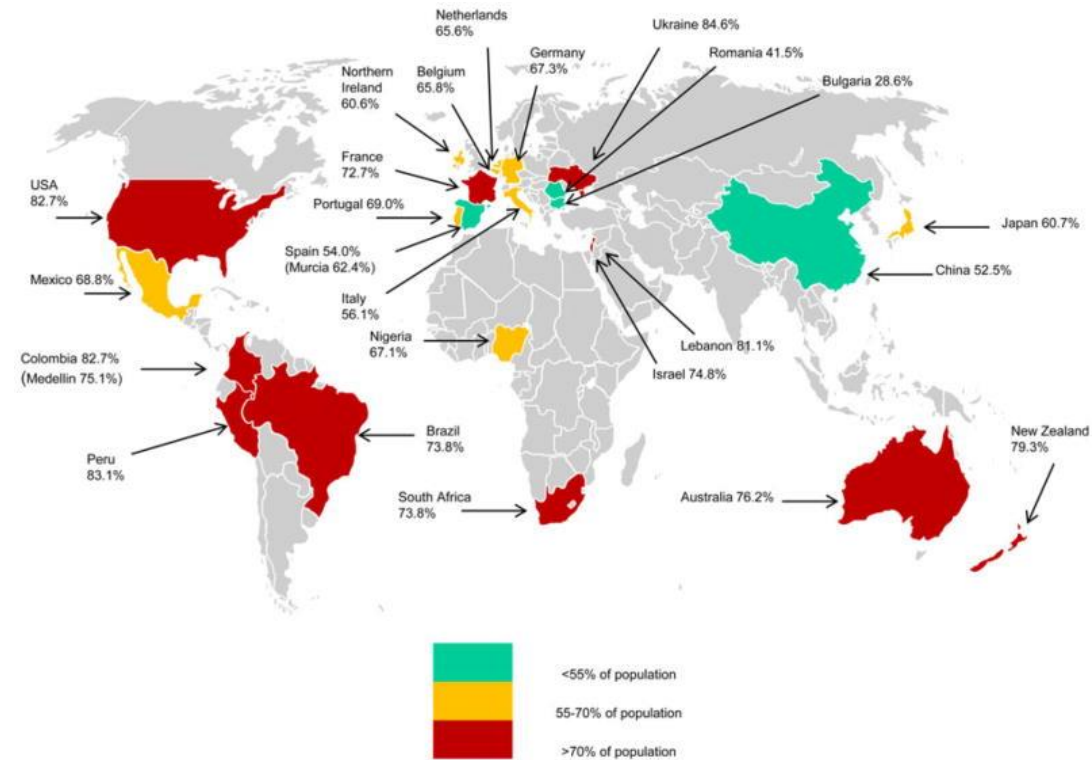
New York Presbyterian

Cambridge University Press

Springer Books



Trauma is Everywhere

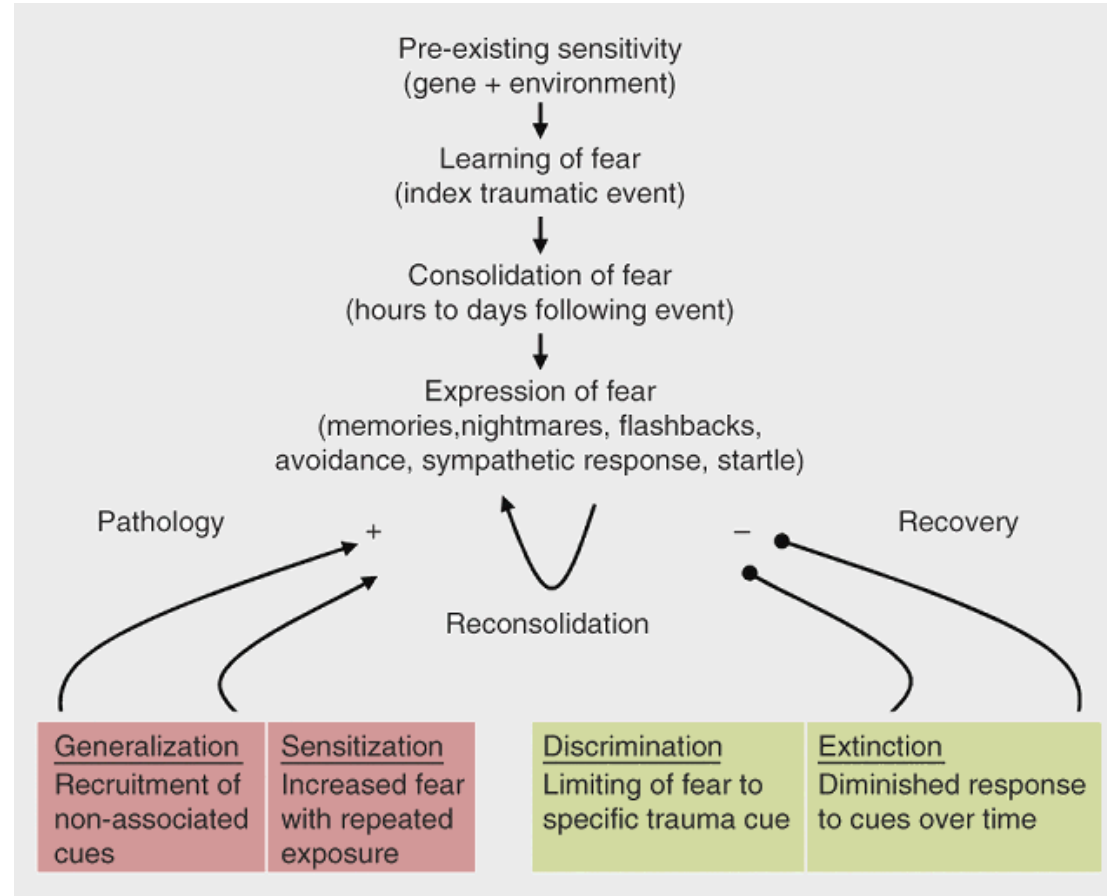


- World Health Organization (Benjet et al., 2016)

Psychiatric Wounds of War

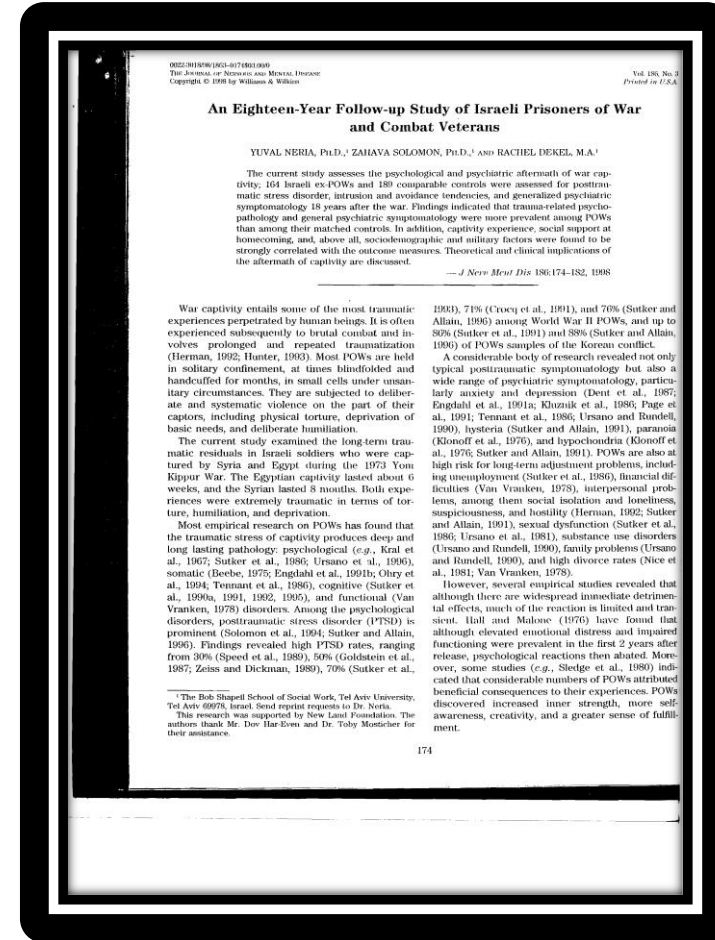
- Soldiers' Heart – Civil War
- Shell Shock – World War I
- Battle Fatigue – World War II
- Combat Neurosis – Korean War
- Post Traumatic Stress Disorder (PTSD) –
Vietnam

Trauma=Fear



Andreo & Ressler 2011

PTSD in Israeli Prisoners of the 1973 War



Posttraumatic Stress Disorder (PTSD)

PTSD is a fear-based disorder

DSM-5:

1. Experiencing or witnessing a traumatic event (i.e.,
EXPOSURE to actual/threatened death, serious
injury, sexual violence)
2. Symptoms in four areas (after exposure):
 - Re-experiencing symptoms
 - Avoidance
 - Negative alterations in cognitions and mood
 - Hyperarousal
3. Significant impairment in major spheres of life

Veterans with PTSD

- Significant suicide rate (~20 per day; 18% of all suicides)
- ~50% do not seek or receive treatment
- Veterans avoid treatment due to mistrust, stigma, concerns about the treatment experience, low emotional readiness, and logistical barriers
- Treatment response in veterans is lower than in civilians (<50%)
- Years of non-specific or ineffective treatments have demoralized veterans
- Innovative treatments are highly needed

Equine Assisted Treatment for PTSD

Hypotheses:

- Horse-human interaction experiences during therapy can foster insight and behavioral changes in patients
- Horse-human interactions offer a platform for eliciting thoughts, feelings, and behaviors related to patients' lives outside treatment

Why Horses?

- Horses are sensitive to verbal and nonverbal cues, providing patients immediate feedback during the horse-human interactions
- Horses are hypervigilant just like people with PTSD
- Horse-Human interactions afford patients and therapists opportunities to foster emotional awareness, reflection, and attunement to thoughts, behaviors, and forms of communication

Why Horses (Cont.)?

- Horses evoke feelings of:
 - Self-efficacy
 - Receptiveness
 - Connectivity
 - Communication
 - Patience
 - Emotional Comfort
 - Trust & Closeness





Florence Nightingale
-1860

“the horse...is often an
excellent companion
for the sick.”



Horses and Veterans with PTSD: a perfect opportunity

- Horses are prey animals: easily frightened, insecure and hypervigilant
- People with PTSD are hypervigilant, feeling unsafe and not sure about other people and surroundings.
- Horses are large and intimidating, an opportunity to engage fear network
- Horses and people are social, looking for attachment figures and eager to feel safe and secure
- Horses have a calming effect
- Non-verbal. Communication

EAT Research So Far...

Extant EAT research is scarce and generally poorly designed, characterized by small sample sizes, inconsistent assessments, unstandardized treatment procedures, and researcher conflicts of interest

- No well-specified treatment manuals of how to deliver EAT
- No adequate safety, feasibility, and efficacy research of EAT
- Biased research lacking adequate standardization or clear therapeutic goals

EAT Research So Far...

- Extant evidence for the efficacy of animal-assisted therapies for PTSD, including EAT, has been mostly anecdotal
- Research has focused on countering dissociative symptoms, emotional numbness, social isolation, and hyperarousal
- These difficulties have precluded a more mainstream acceptance of EAT
- In sum, it is often not clear what EAT comprises or means, let alone whether it works

Addressing the gaps....

Establishing the Man O' War Project at Columbia University with the following goals:

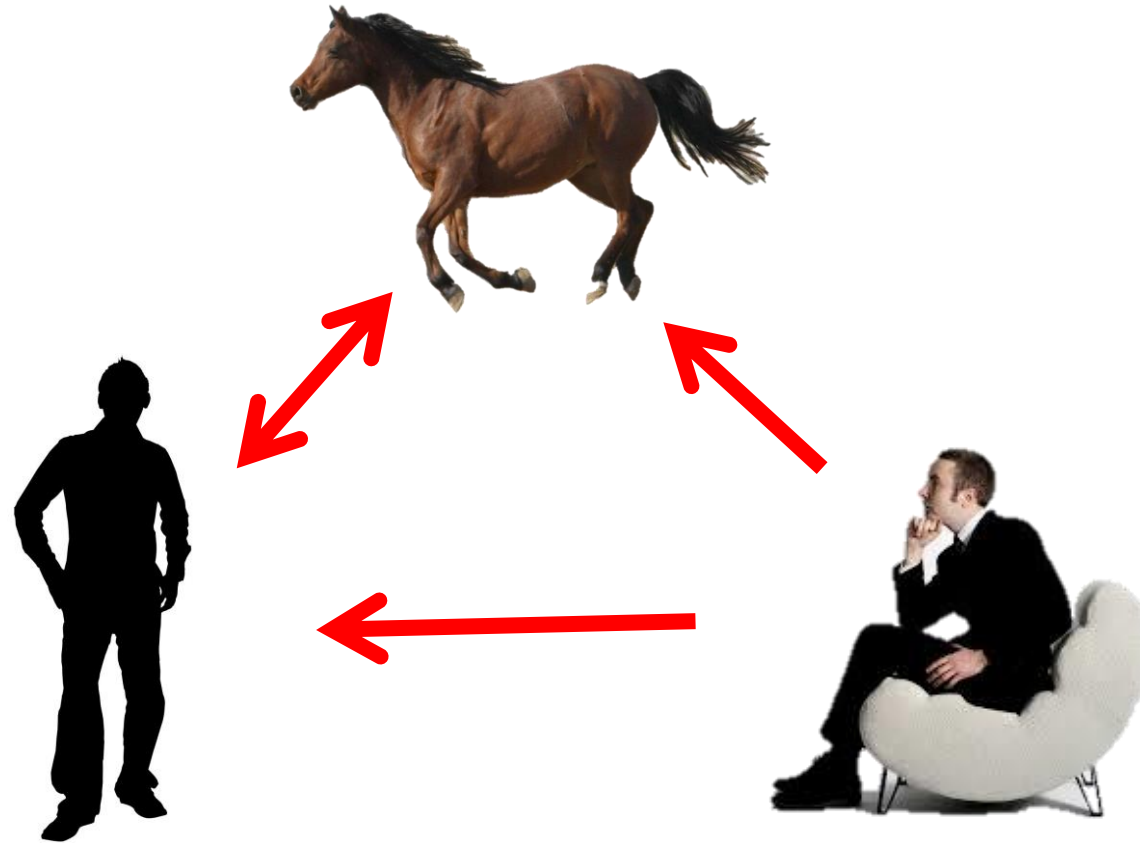
1. Developed and manualize a group EAT for PTSD (EAT-PTSD) comprising of eight 90-minute weekly group sessions
2. Pilot testing: small sample (N=8 patients from two EAT groups)
3. Large open trial (N=63)
4. Brain imaging study (N=19; multimodal)

Treatment team

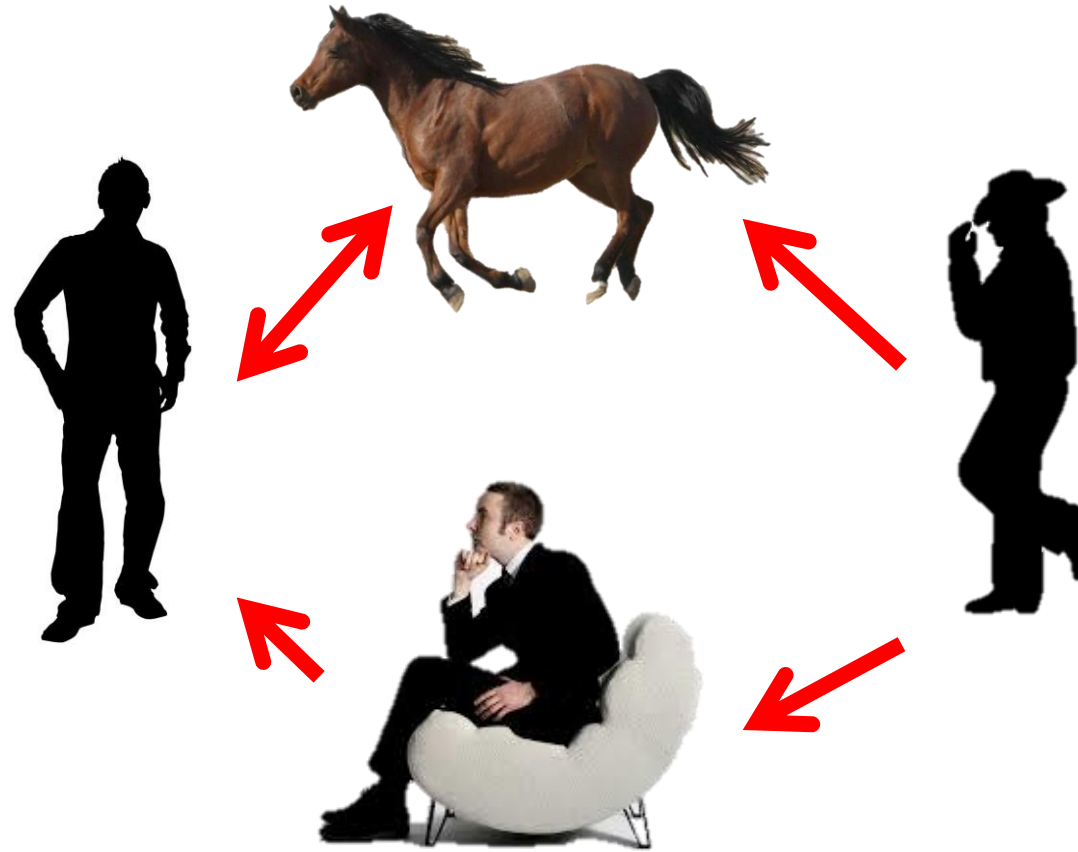
- Pls: Drs. Yuval Neria and Prudence Fisher (Columbia University, NY)
- Equine specialists:
 - Jody Jacob-McVey, Sue Stegmeyer
- Mental health professionals:
 - Bonnie Malajian, LCSW, Debra Farber, LPC
- Horse wrangler:
 - April Neumann, Bergen Equestrian Center
- Horses - Chuck, Gordon, Ollie, Crafty, Jack..

**All humans are "EAGALA certified"*





Therapist gets to observe interactions between client and horse



Therapist gets to observe interactions between client and horse; horse professional observes effects on horse and client

Manualizing the Treatment (EAT-PTSD)

- Ground-based (no riding)
- Groups of 4 (3 -6) -- mixed gender, mixed traumas
- Eight 90-minute weekly sessions
- Take place in “round pen” – privacy
 - Team approach
 - 90 minute sessions; once per week
 - 4-6 veterans, 2-3 horses (constant)
 - 8 weeks
 - Structured (but experiential)
 - Progressive

EAT-PTSD includes common features of psychotherapy

- Affective arousal (encouraging and allowing emotional connection)
- Feeling understood by therapist
- Developing a framework for understanding yourself
- Benefitting from professional expertise
- Having a therapeutic procedure
- Developing optimism for improvement
- Having successful (and pleasant) experience

Equine-Assisted Therapy for Veterans with PTSD: Manual Development and Preliminary Findings

Shay Armon, BA*,†; Prudence W. Fisher, PhD*,†,‡; Alison Pickover, PhD*,†,§; Ari Lowell, PhD*,†; J. Blake Turner, PhD*,†; Anne Hilburn, MA*; Jody Jacob-McVey, BS‡,§; Bonnie E. Malajian, LCSW‡; Debra G. Farber, LPC, MA, MCIS‡; Jane F. Hamilton, PhD||; Allan Hamilton, MD¶; John C. Markowitz, MD*,†; Yuval Neria, PhD*,†,**

ABSTRACT Introduction: Equine-assisted therapy (EAT) for post-traumatic stress disorder (PTSD) has attracted great interest despite lacking empirical support, a manual, and a standardized protocol. Our team of experts in EAT and PTSD developed an eight-session group EAT treatment protocol for PTSD (EAT-PTSD) and administered it to two pilot groups of military veterans to assess initial effects. Materials and Methods: We describe the development of the treatment manual, which was used with two pilot groups of veterans. Protocol safety, feasibility, and acceptability were assessed by reported adverse events, treatment completion rates, and self-rated patient satisfaction. Preliminary data on PTSD, depressive, and anxiety symptoms and quality of life were collected pretreatment, midpoint, post-treatment, and at 3-month follow up. Results: No adverse events were recorded. All patients completed treatment, reporting high satisfaction. Preliminary data showed decreases in clinician-assessed PTSD and depressive symptoms from pre to post-treatment and follow-up (medium to large effect sizes, $d = .54$ – 1.8), with similar trends across self-report measures ($d = 0.72$ – 1.6). In our pilot sample, treatment response and remission varied; all patients showed some benefit post-treatment, but gains did not persist at follow-up. Conclusions: This article presents the first standardized EAT protocol. Highly preliminary results suggest our new manualized group EAT-PTSD appears safe, well-regarded, and well-attended, yielding short-term benefits in symptomatology and quality of life if unclear length of effect. Future research should test this alternative treatment for PTSD more rigorously.

INTRODUCTION

Post-traumatic stress disorder (PTSD), a pervasive and debilitating disorder, occurs following traumatic events involving exposure to, or threat of, physical harm, death, or sexual violence to oneself or another. Symptoms include re-experiencing (e.g., nightmares, flashbacks), avoidance behaviors, negative cognitions and mood, and altered arousal and

hyper-reactivity.¹ PTSD can persist for years and is associated with significant functional impairment, psychiatric comorbidity, suicidality, substance use, chronic pain, poor physical health, and delayed treatment seeking.^{2–5} Equine-assisted therapy (EAT) is an increasingly popular but widely variable, unstandardized, and understudied intervention for trauma-exposed patients. Its utility in treating PTSD is unclear.

Military service members face high trauma risk through combat, injury, captivity, and sexual assault.^{6–9} In one study, up to 95% of post-9/11 service members surveyed endorsed experiencing attacks, ambushes, or seeing human remains.⁷ U.S. adults overall have lifetime PTSD prevalence below 10%,¹⁰ whereas prevalence among post-9/11 veterans reaches 23%.¹¹

Veterans often avoid seeking mental health treatment: one study found that only 23–40% of post-9/11 veterans screening positive for a probable mental health disorder had sought care.⁷ Barriers to care include inadequate education about PTSD, logistical impediments, stigma, concerns about treatment experience, and low-emotional readiness.^{12–14} Patients who do present for treatment rarely enroll in evidence-based exposure interventions (e.g., prolonged exposure, and cognitive processing therapy),^{15–17} and dropout is high.^{18–21} One-third to one-half of patients receiving exposure-based treatments for military service-related PTSD demonstrate no clinically significant improvement, and two-thirds retain their PTSD diagnosis post-treatment.²² Medications (most commonly, serotonin reuptake inhibitors) may benefit patients,²³ yet some veterans report side effects, do not improve, or

*New York State Psychiatric Institute, 1051 Riverside Drive, New York, NY 10032

†Department of Psychiatry, Columbia University Irving Medical Center, 1051 Riverside Drive, New York, NY 10032

‡Bergen Equestrian Center, 40 Fort Lee Road, Leonia, NJ 07605

§EquiSense Solutions LLC, 33 West 93rd Street, 3B, New York, NY 10025

¶Rancho Bosque Equestrian Center of Excellence, House Hamilton Business Group, P.L.C., 8649 E Woodland Road, Tucson, AZ 85749

||Department of Surgery, University of Arizona Health Sciences Center, 1501 N. Campbell Avenue, Tucson, AZ 85724

**Department of Epidemiology, Columbia University Irving Medical Center, 722 West 168th Street, New York, NY 10032

‡This work reflects equal contribution of the first three authors.

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ClinicalTrials.gov Identifier: NCT03068325

Previous presentations: This study was previously presented at the International Society for Traumatic Stress Studies 33rd Annual Meeting (Chicago, IL, USA; November 9, 2017), Milken Global Conference (Beverly Hills, CA; May 1, 2018).

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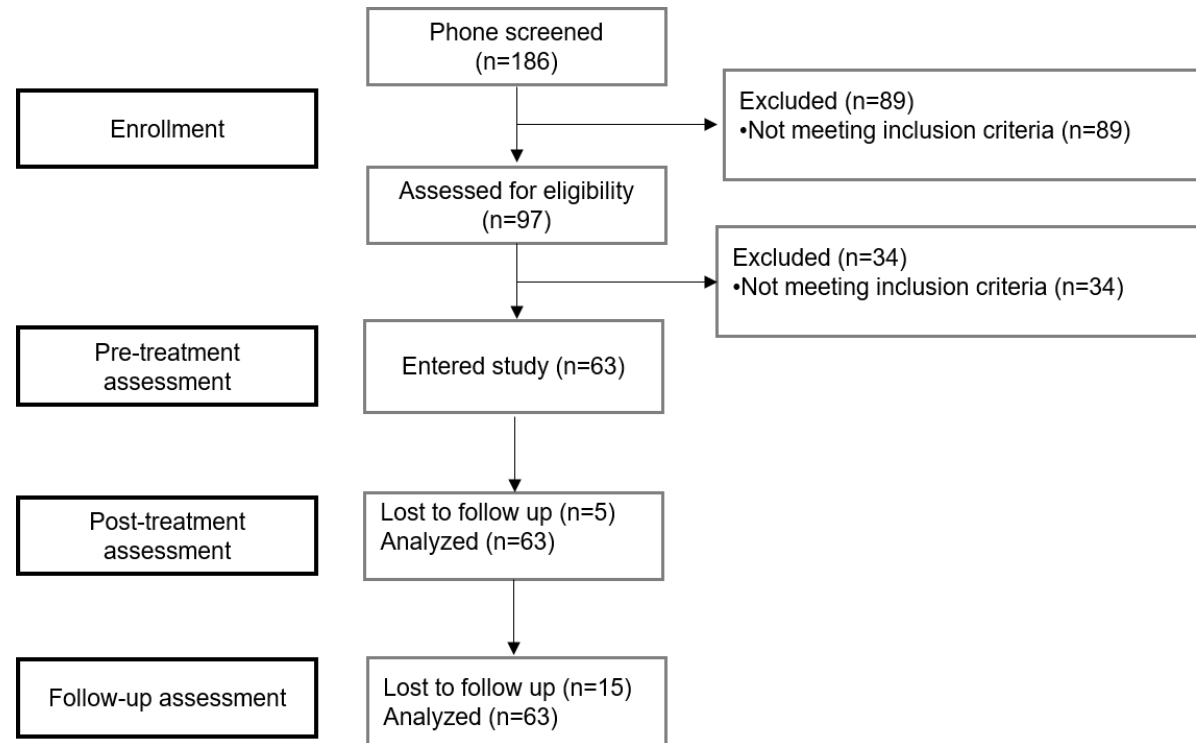
EAT Treatment

- **Session 1**: orientation (rationale, description, possible benefits). It provides psychoeducation (e.g., common reactions to trauma, development and maintenance of PTSD), a barn tour, and ends with meeting the horses in a private “round pen.”
- **Early phase** (sessions 2-3): acquainting patients with the horses, on grooming exercises, and on learning “leading” – directing the horses with a rope or a wand
- **Middle phase** (sessions 4-7): advanced exercises to facilitate patient mastery and comfort with the horses. For example, patients learn to use a wand to distance the horse, creating personal space, or to collaboratively maneuver a horse onto a tarpaulin, fostering teamwork and cooperation.
- **Final session**: graduation ceremony celebrating patients’ treatment progress and accomplishments

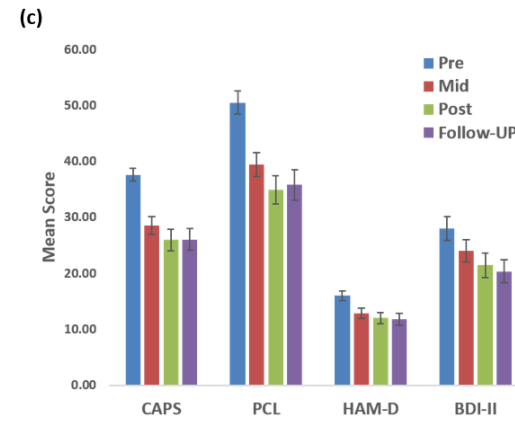
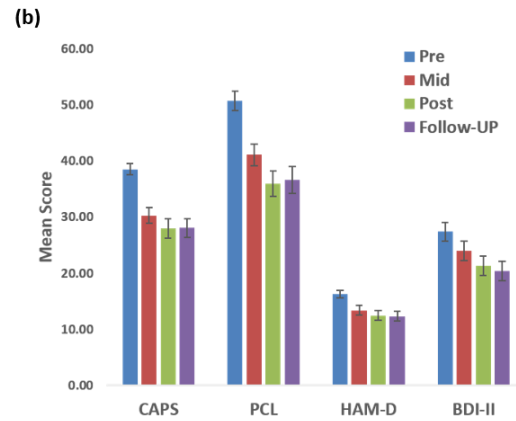
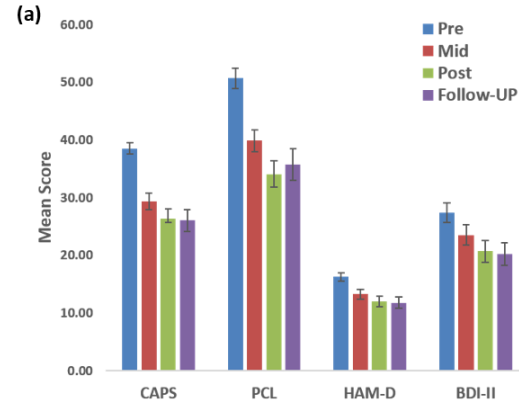
Assessments by Reliable Assessors

1. Assessment of PTSD and depression at midpoint (after week 4)
2. Assessment of PTSD and depression end of protocol (after week 8)
3. Assessment of PTSD and depression 3 months later
4. Patient is compensated for assessments (\$100) and provided with boots for the barn.
5. If agrees (and eligible) for MRI (baseline and end of treatment)

Participants' Progress through Study Stages



Changes in PTSD (CAPS, PCL) and Depression (HAM-D and BDI-II) Scores



Discussion

- EAT-PTSD is potentially safe, well-tolerated, with large effect size improvement on standard ratings
- Treatment benefits across all outcome measures largely persisted three months following treatment
- 51% and 54% of veterans demonstrated clinically significant change at post-treatment and follow-up
- 46% and 37% scoring below the cutoff score at post-treatment and follow-up, respectively
- Randomized controlled trials are needed now



NEW YORK
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Office of
Mental Health



COLUMBIA UNIVERSITY
IRVING MEDICAL CENTER



MAN O' WAR
PROJECT

Brain Imaging: Magnetic Resonance Imaging (MRI)

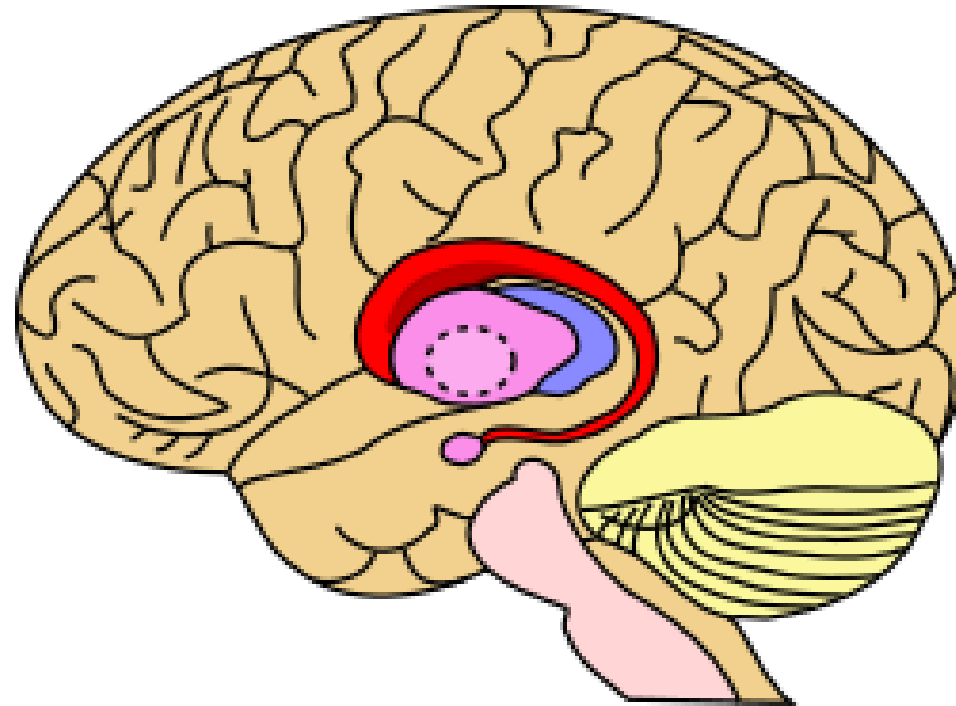
Goal: to employ longitudinal neuro-imaging, including structural magnetic resonance imaging (sMRI), resting state-fMRI (rs-fMRI), and diffusion tensor imaging (DTI), to determine mechanisms and predictors of EAT outcomes for PTSD

Method

- 19 veterans with PTSD completed eight weekly group sessions of EAT, undergoing multimodal MRI assessments before and after treatment
- Clinical assessments were conducted at baseline, post-treatment and at 3-month follow-up.

Caudate Nucleus

- Part of the Corpus Striatum
- A component of the Basal Ganglia Network (BGN)
- A region that is part of the reward system: underlying pleasure seeking and experience



Thalamus

Functions: large hub relaying sensory signals including motor signals to the cerebral cortex and involved in regulation of consciousness, sleep, and alertness



Results

- At post-treatment patients showed a significant increase in functional connectivity (FC) and reduction in the gray matter density of the thalamus and the caudate.
- The increase of caudate FC was positively associated with clinical improvement seen immediately at post-treatment and at 3-month follow-up.
- Higher baseline caudate FC was associated with greater PTSD symptom reduction post-treatment.

Discussion

- Abnormal functioning within the caudate has been documented in depression, substance abuse, and PTSD
- The limbic-basal ganglionic reward system may be modified by the eight-week-long EAT employed for the treatment of PTSD
- The caudate nucleus is involved in reward anticipation and response
- Increase in functional connectivity together with pruning effect in the caudate from pre- to post-treatment
- PTSD have a disrupted, dysfunctional reward circuitry, that might be alleviated through EAT
- Overall: increase capacity to seek and experience pleasure

Conclusion

- PTSD is prevalent and debilitating
- Current treatments are limited
- Novel effective treatments are needed
- Horse-human interactions have promise
EAT is safe, innovative, and seems to be effective
- Clinical and brain results are innovative suggesting clinical effects are associated with tangible changes in the brain
- Effects on both fear (PTSD symptoms) and reward systems

- Thank you!
- Questions?