

## **Basic neurobiological and psychological mechanisms underlying therapeutic effects of Equine Assisted Activities (EAA/T)**

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The spectrum of curative psychological effects that have been associated with equine assisted activities (EAA) indicates that interactions between humans and horses might have the potential to reduce anxiety, stress, pain, anger, aggression and depression and may facilitate social communication and trust in others. Our current proposal is based on the assumption that these effects of EAA reported so far are based on a shared mechanism. We hypothesize that the interaction between the hypothalamo-pituitary-adrenal axis (HPA, stress axis) in interaction with the oxytocin system is the central neurobiological mechanism behind these effects. Based on this assumption and the psychological background of attachment theory, cortisol, heart rate, trust, and social interaction and thereby indirectly also oxytocin-related effects of human-horse interactions will be measured in two controlled intervention studies with twenty insecurely attached children each. Since oxytocin release reduces anxiety and stress levels and facilitates social interaction and trust in others both studies investigate whether contact to a horse can help insecurely attached children who mistrust or avoid adult caregivers to engage in more secure and trusting relationships with these persons.

In the first study toddlers (age 1-2) who had suffered domestic violence or parental loss will be exposed to eight weekly sessions of either EAA (intervention group) or supervised play interactions (control group), both together with their (foster) mothers. We will investigate whether human-horse interactions will facilitate the development of a secure and trustful relationship better due to oxytocin-related effects of the human-horse interaction. Instruments

from attachment research assessing the quality of the mother-child relationship are applied before and after the eight-week-intervention. Furthermore, psychophysiological reactions, e.g. stress measured via cortisol and heart rate, and interaction between mother, child, horse and therapist are assessed during each session.

In the second study we will explore whether ten insecurely attached children (age 8-10) with behavioral and emotional disorders will open up easier to their therapists directly after EAA than the ten children in the control group who receive play therapy with the same therapist. Interaction of the child with the therapist and the horse is observed and psychophysiological reactions are measured during each of the eight therapy session. Trust to the therapist is measured before and after the intervention.

Confirmation of our hypothesis that the effects of EAA/EAT are based on the oxytocin system and attachment would mean a big step towards a deeper understanding of why and how EAA/EAT might positively affect humans.