



# Muscular Tension as a Marker of Stress in Horses

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## Background

- In humans, stress = muscular tension ([Lundberg et al., 1994](#))
- Objective:** Investigate effects of social isolation, sham clipping, & novel object exposure on muscular and behavioral responses in horses.
- Hypothesis:** Muscular & behavioral responses would be altered.

## Animals

- Eight mature Standardbred horses (4 mares, 4 geldings)

## Experimental Design

- Replicated, balanced 4x4 Latin square with 3 min periods and 10 min washouts

**Control (CON):** loose in box stall, companions in adjacent stalls

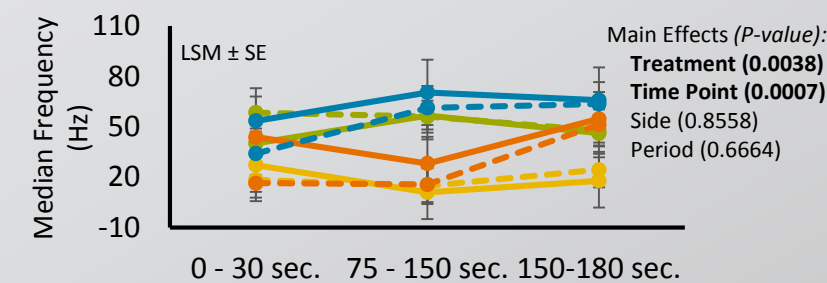
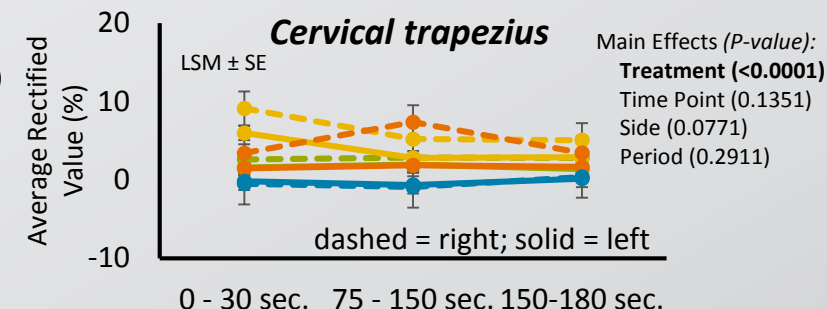
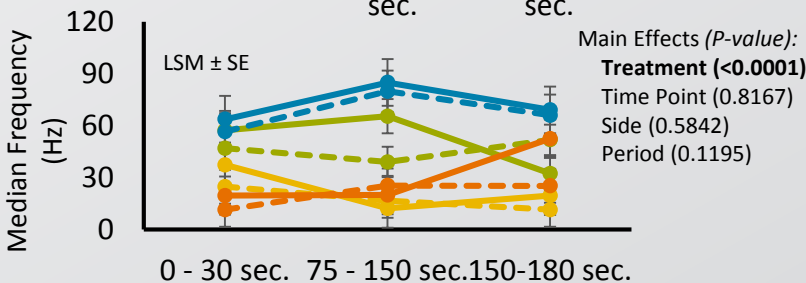
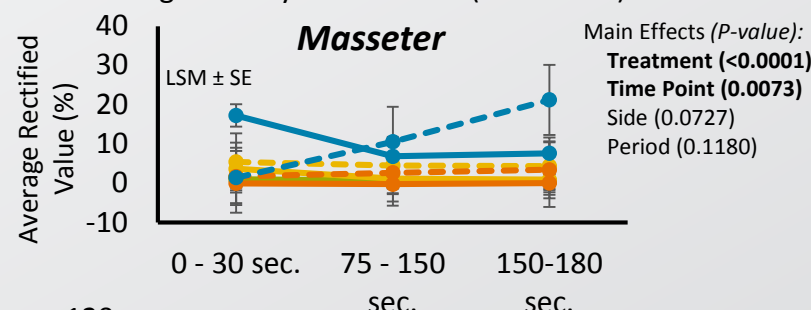
**Social Isolation (ISO):** loose in box stall, companions removed from barn

**Novel Object (NOV):** restrained with halter & lead, standing on tarp

**Sham Clipping (CLIP):** restrained with halter & lead, clippers on neck (alternate left and right)

	CON	ISO	NOV	CLIP
<b>Total Stress Related Behaviors</b> (LSM ± SE)	1.46 ± 0.29	3.25 ± 0.26*	2.31 ± 0.28	1.50 ± 0.36

\*Differs significantly from control ( $P = 0.0019$ )



## Conclusions & Future Directions

- CLIP** = ↑ activity in *masseter* (average rectified value & median frequency)
- ISO** = ↑ stress related behaviors & changed activity in *masseter* & *cervical trapezius* (↑ average rectified value & ↓ median frequency)
- Muscle activity can be used to assess stress in horses
- Observed responses dependent on condition – array of measurements may ↑ accuracy
- Next Step:** Measure muscle activity in an applied setting