

# The Neuro-Endocrine Effects of the TASER X26 Electronic Control Device

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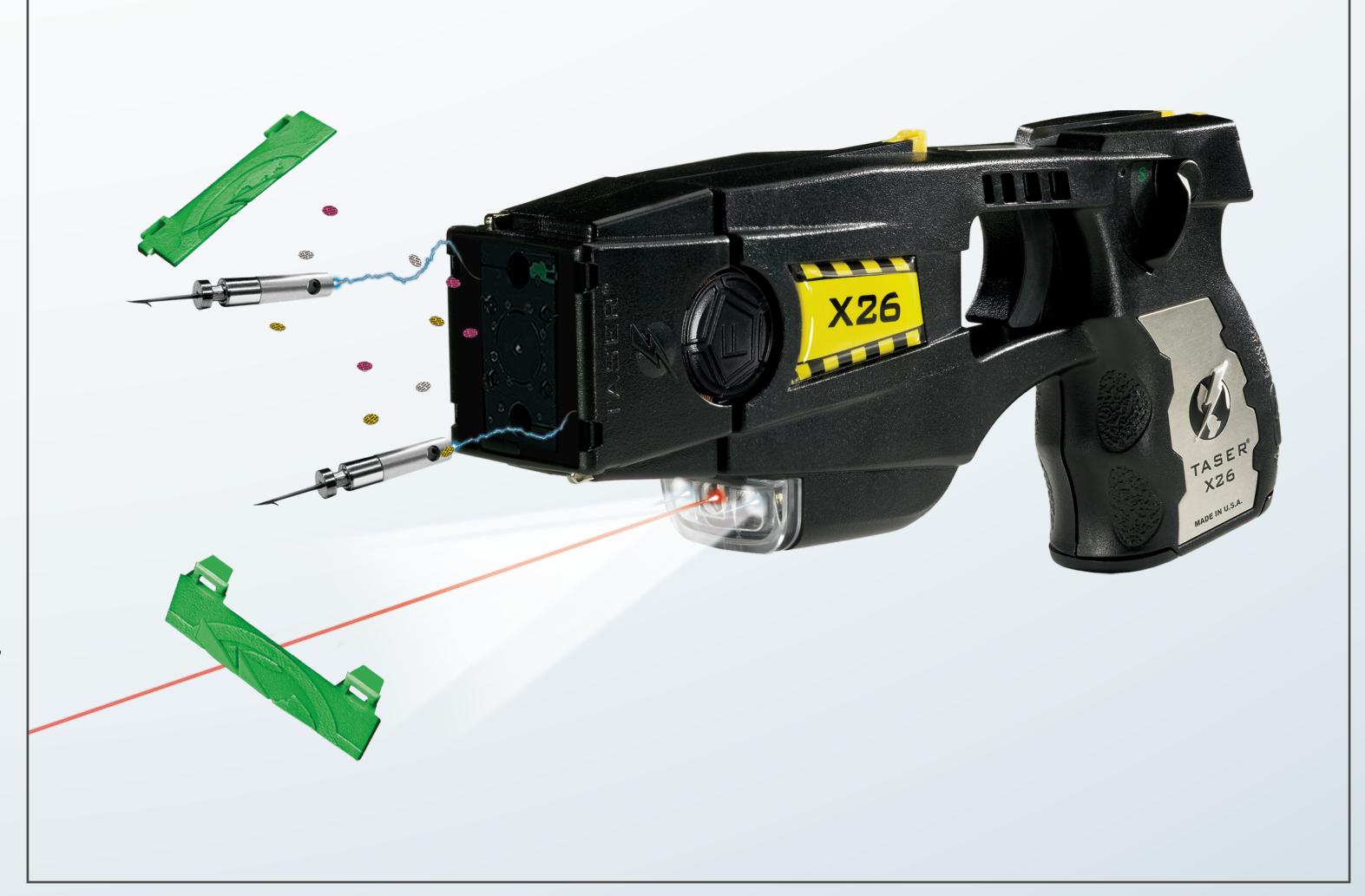
### Introduction

This is the first study to examine the human stress response to Electronic Control Devices (ECD), Oleoresin Capsicum (O.C.), a cold-water tank immersion, and a defensive tactic drill.

### Methods

Subjects received either a five-second exposure from the TASER® X26™ ECD with the probes fired into the back from seven-feet; a five-second spray of O.C., a skin and mucous membrane irritant, to the eyes; a 45-second exposure of the hand and forearm in a 0°C cold water tank; or a one minute one-on-one defensive tactics drill.

Salivary alpha-amylase, a measure of the sympathetic-adrenal-medulla axis of the human stress response (versus sympathetic tone), and salivary cortisol, a measure of the hypothalamus-pituitary-adrenal axis of the human stress response, was collected by passive drool before and after the exposures and analyzed by Salimetrics, Inc. (State College, PA).



## Results

Subjects were enrolled with 16 each in the ECD and cold-water tank groups, and ten each in the O.C. and defensive tactics groups. The mean ages was 43 for the cold-water tank group; 35 for the ECD group; 28 for the O.C. group; and 45 for the defensive tactics drill.

The defensive tactics drill resulted in the greatest change in salivary alph-amylase at 10 - 15 minutes with a change of 63.8 U/mL. O.C. was next with a change of 37.4. The ECD and cold-water tank immersion did not appear particularly activating.



O.C. had the greatest change in salivary cortisol at 15 - 20 minutes with a change of 0.5 mcg/dL. The ECD was next with a change of 0.38, and the defensive tactis drill after that with a change of 0.25. The defensive tactics drill had the greatest delayed change from baseline in cortisol with a change of 0.47. The cold-water tank immersion did not appear particularly activating.

## Conclusions

Our preliminary data suggests that physical exertion during custodial arrest may be most activating of the human stress response.

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