

### Introduction

Because of the prevalence of methamphetamine abuse worldwide, it is not uncommon for subjects in law enforcement encounters to be methamphetamine intoxicated. This is the first study on the use of electronic control devices (ECD) in an animal model of methamphetamine intoxication.

### Methods

16 Dorset sheep (26-78 kg) received 0.0 mg/kg (n=4), 0.5 mg/kg (n=4), 1.0 mg/kg (n=5), or 1.5 mg/kg (n=4) of methamphetamine hydrochloride as an intravenous bolus during continuous cardiac monitoring. The animals received the following exposures in sequence: a) 5-second continuous; b) 15-sec intermittent; c) 30-sec intermittent; d) 40-sec intermittent. Darts were inserted to depth at the sternal notch and the cardiac apex. Cardiac motion was determined by thoracotomy (smaller animals, < 38.5 kg) or echocardiography (larger animals, > 68 kg).



### Results

All animals demonstrated signs of methamphetamine toxicity with tachycardia, hypertension, and atrial and ventricular ectopy in the 30-minute period immediately after administration of the drug. Smaller animals (n=8, < 32 kg, average 29.4 kg) had supraventricular dysrhythmias after the exposures. Larger animals (n=8, > 68 kg, average 72.4) had only sinus tachycardia after exposure. One of the smaller animals had frequent episodes of ventricular ectopy after all but two exposures. Thoracotomy performed on three smaller animals demonstrated cardiac rate capture during the exposure consistent with previous animal studies. In the larger animals, none of the methamphetamine-intoxicated animals demonstrated capture. No ventricular fibrillation occurred with capture.

### Conclusions

In smaller animals, ECD exposure exacerbated atrial and ventricular irritability, but this effect was not seen in larger animals.

In adult sized animals, the study did not indicate that methamphetamine intoxication precluded the use of electronic control devices.