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Version 2

## Vandy - Transverse Aortic Constriction V.2

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**We use this protocol and it's working**

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## Abstract

### Summary:

Hypertension in man can be modeled in the mouse by introducing a constriction in the major artery (aorta) thereby obstructing outflow and increasing the afterload to the heart. This protocol describes the procedure for aortic banding aka transverse aortic constriction (TAC).

## Materials

### Reagents and Materials:

- Pentobarbital
- Buprenorphine
- Betadine
- 70% alcohol
- PE-50 tubing
- 6-0 sutures
- 7-0 sutures
- 8-0 sutures

- 1 Mice are anesthetized with pentobarbital (50 mg.kg, IP).
- 2 The ventral neck and left parasternal region is shaved and disinfected with Betadine followed by 70% alcohol.
- 3 The mouse is positioned supine on a heating pad and a small incision is made through the skin underlying the trachea.
- 4 The trachea is exposed, a small puncture is made in the trachea, and endotracheal intubation is performed using a PE-50 tube.
- 5 The endotracheal tube is connected to a small rodent ventilator (Harvard Apparatus) for mechanical ventilation of the mouse.
- 6 With the use of a surgical microscope, a left thoracotomy is performed and the second intercostal space is entered using scissors and blunt dissection to expose the aortic arch.
- 7 A 27G blunt needle is placed parallel to the transverse aorta between the innominate and left common carotid arteries. A 7-0 ligature is placed around the transverse aorta and needle and tied.
- 8 The needle is removed to yield a transverse aortic constriction (TAC) of ~0.4 mm in diameter. In sham mice, the entire procedure is identical except for the ligation of the aorta.
- 9 The chest is closed in layers with 7-0 sutures.
- 10 The mouse is gradually weaned from the ventilator to resolve any possible pneumothorax.
- 11 Once spontaneous respiration resumes, the endotracheal tube is removed and the trachea is closed with 8-0 suture. The skin is then closed with 6-0 suture.
- 12 The mouse is maintained on the heating pad until fully recovered from anesthesia.



- 13 Buprenorphine is administered SC immediately following surgery and every 8-12 hr for 72 hr.
- 14 One day following the TAC procedure, the mouse is subjected to Doppler echocardiography (Vevo2100) to determine the degree of stenosis induced by the ligation.