T400-Series Surgical Protocol

Rat Ascending Aorta: Chronic Blood Flow Measurement (Right Thoracotomy-Side Exit Probe)

APPLICATION BASICS

Site:	Ascending Aorta
Species:	Rat
Body Weight:	270 grams
Duration:	Chronic
Vessel Diameter:	2.5 mm

PROBE

Size:	2.5 mm
Reflector:	JN
Connector:	4-pin
Cable Length:	10 cm
Catalog #:	MC-2.5PSL-JN-WC10-CM4S(CA4S)-GC

FLOWMETER

TS420 Perivascular Module

Flow Ranges Observed

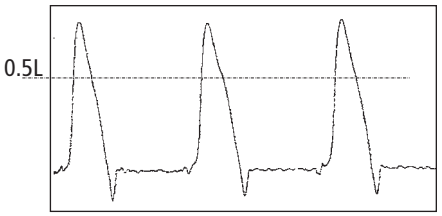

Fig. 1. Instantaneous flow in a conscious 300 gram rat peaked at 550 ml/min. Mean flow was 90 ml/min.

2.5PSL (Fig. 2) 2.5PSS (Fig. 3)

Right Thoracotomy

Anesthetize the rat with sodium pentobarbital (60 mg/kg/IP) and ventilate mechanically. Place the rat in left lateral recumbency and make an incision in the right 3rd intercostal space, being careful to avoid the internal mammary artery. Retract the ribs and the right lobe of the lung to expose the aortic arch. Carefully isolate the ascending aorta from the pulmonary artery using blunt dissection. Pass two pieces of 5-0 silk around the aorta to aid in placing the vessel within the lumen of the Probe. Insert the Probe into the thoracic cavity and gently compress the aorta so that the J-reflector bracket can be passed around the vessel.

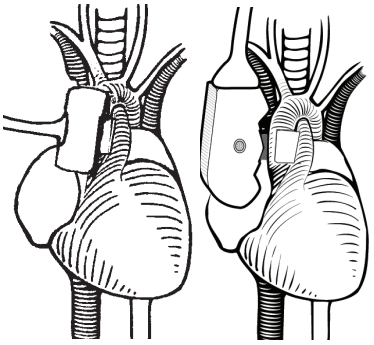

Fig. 2 Fig. 3

Choice of Flowprobe (See table on next page.)

2.5PSL Lateral Cable Probe (Fig. 2): The 2.5PSL lateral Probe configuration allows the cable to be anchored in place at the thoracotomy incision site without a separate puncture to properly orient a "side" cable orientation Probe. Position the Probe so that the smooth back of the Probe opposite the reflector is positioned against the sternum. The cable is passed through the thoracotomy and closed routinely.

2.5PSS Side Cable Probe (Fig. 3): This side cable orientation requires a second puncture to pass a trocar through the pectoral muscles and the 2nd intercostal space to correctly orient the cable to keep the Probe from twisting on the vessel. Pass the CM4S or CA4S connector and cable through the trocar to exteriorize it. Close the thoracotomy site routinely.

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Exteriorizing the Connector

Create a subcutaneous tunnel with straight hemostats between the forelimbs and up to the neck. Place the animal in ventral recumbency and make a 1.5 cm mid-scapular incision. Route the connector and cable to exit between the shoulder blades. Place a patch of Dacron mesh under the skin to reinforce skin at the mid-scapular exit site. Close the skin incision and place the CM4S or CA4S connector in the cuff. Flexible silicone and rigid delrin cuffs are available for both connector types. Suture the cuff to the skin through Dacron mesh placed subdermally to reinforce sutures.

ACKNOWLEDGEMENT

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REFERENCES

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Greene, E.C, Anatomy of the Rat, Hafner Publishing Co., New York, 1963.

Rat Surgical Video
Blood Flow Measurement in the Rat with "Implantation Techniques of the Transonic Flowprobe on the Rat Ascending Aorta," Smith, vp-10

Probe Recommendations for Animal Weight & Protocol				
Weight (Grams)	Probe Size	Probe Model	Cable Orientation	Surgical Approach
< 250	2 mm	2PSB	Back	Medium sternotomy
		2.5PSL	Lateral	Right thoracotomy at 3rd intercostal
250 - 350	2.5 mm	2.5PSS	Side	Right thoracotomy with CA4S micro-connector exited at 2nd intercostal
400 - 500	3 mm	3PSL	Lateral	Right thoracotomy at 3rd intercostal
		3PSB	Back	Medium sternotomy

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