

# T400-Series Surgical Protocol

## Fetal Sheep Carotid Artery: Chronic Blood Flow Measurement

### APPLICATION BASICS

Site:	Carotid
Species:	Fetal Sheep
Stage of Gestation:	118-140 days
Duration:	Chronic, 21 days
Vessel Diameter:	2 - 3 mm

### PROBE

Size:	3 mm (side exit)
Reflector:	L with sliding cover
Connector:	4-pin
Cable Length:	1 m
Catalog #:	MC-3PSS-LS-WC100-CM4B-GC

### FLOWMETER

TS420 Perivascular Module

## Application

Carotid arterial blood flow has been used in pregnancy research. We used blood flow registration from both carotid arteries in combination with other fetal registrations (e.g. electro cortico gram, electro cardiogram and blood gas measurements).

## Surgical Approach

Induce with diazepam 1 mg/kg, 0.2 mg glycopyrrolate and ketamine 10 mg/kg, i.v., and maintain anaesthesia with 0.5% halothane inhalation and ketamine infusion, 3 mg/ml/min i.v. The ewe was intubated and mechanically ventilated with N<sub>2</sub>O/O<sub>2</sub> mixture.

Place anesthetized sheep in dorsal recumbency and make a ventral paramedian incision from the umbilicus to a point 2 cm cranial to the udder. The skin incision is made 1 to 2 cm off midline to avoid the median subcutaneous vein. Retract the skin and associated vascular structures and continue the incision through the midline of the abdominal wall.

Use a trocar to puncture the abdominal wall of the paralumbar fossa. Pass the Probe and cable through the trocar into the abdomen towards the uterus.

Identify and exteriorize the uterine horn containing the fetus. Palpate the fetus to identify the orientation and make a traverse incision in the uterus to allow exteriorization of the fetal head and neck. Once the fetus is exposed, palpate the trachea and make a median incision below the larynx. Expose the carotid artery over 3 cm. Make a pocket around the carotid artery in which the Probe fits in such a way that the Probe and cable parallel the carotid artery. Make a small paramedian skin incision above the first rib, pass the Probe and cable subcutaneous toward the pocket. Lift the carotid artery and pass the reflector bracket of the Probe under the artery. Close and secure the slide, drop a blood clot (maternal blood) around the bracket and slide, and suture the adjacent tissue (gl. thyroidea and m. sternocleidomastoideus) over the Probe. Make sure that the fetal

*(Continued on next side.)*

## Flow Ranges Observed

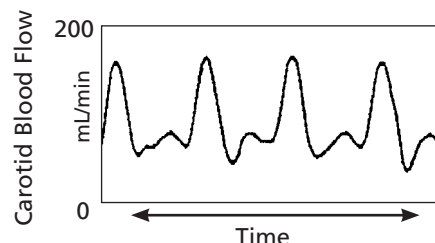


Fig. 1: Mean carotid artery blood flow in 132-day gestation lambs was 80 ml/min (range: 53-117 ml/min in 6 fetuses); in 138-day gestation lambs was 77 ml/min, (range: 49-103 ml/min in 5 fetuses).

### FETAL LAMB: 140-DAY GESTATION

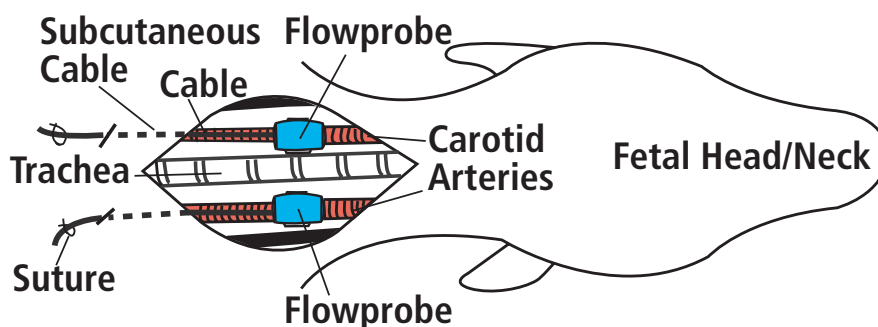
SITE	MEAN BLOOD FLOW	SAMPLING RATE
Right carotid	66 ml/min	10Hz
Left carotid	63 ml/min	10Hz

## Fetal Sheep Carotid Artery: Chronic Blood Flow Measurement Cont.

### Surgical Approach cont.

head and neck can be moved without moving the Probe. Secure the cable when necessary in a parallel position to the carotid artery. Close the fetal skin with 2-0 simple continuous sutures. Secure the Probe cable to the fetal skin with a 2-0 simple interrupted suture near the skin incision above the first ribbon.

Close the uterus with a continuous Cushing pattern oversewn with a continuous Lambert. The Probe cable is exteriorized through this incision. Make sure that there is enough cable length in the abdomen to prevent traction to the Probe. Close the body wall and skin routinely. Suture the skin at the exit site of the Probe.



### ACKNOWLEDGEMENT

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