T400-Series Surgical Protocol

Sheep Portal Vein: Chronic Blood Flow Measurementt

APPLICATION BASICS

Site:	Portal vein
Species:	Sheep
Weight:	40 kg
Duration:	Chronic
Vessel Diameter:	2 - 15 mm

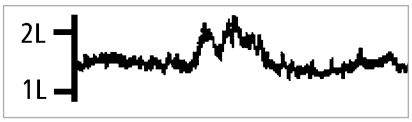
PROBE

Size:	16 mm (side exit)
Reflector:	U with wide silicone shield
Connector:	10-pin
Cable Length:	1 meter
Catalog #:	MC-16PSS-USW-WC100-CRA10-GC

FLOWMETER

TS420 Perivascular Module

Flow Ranges Observed



Total Hepatic Flow
(portal vein & hepatic artery).

Application

Developed for early validations of transit-time technology this protocol has also been used to study the intestinal uptake of nutrients and hepatic metabolism. The total flux of any metabolite is estimated from the product of concentration and blood flow. In one study, the portal vein and femoral artery were also catheterized to allow periodic collection of blood samples. Hemoglobin and O_2 saturation was measured and used to calculate O_2 concentration. The arteriovenous O_2 difference and portal flow was used to calculate O_2 uptake, an indication of the energy cost of nutrient absorption. Other researchers have measured total hepatic flow by placing a single Probe around the hepatic artery and portal vein.

Surgical Approach

Premedicate with 0.4 g glycopyrrolate IM. Induce with 1 g ketamine IM and maintain anesthesia on 1.5% - 2% halothane.

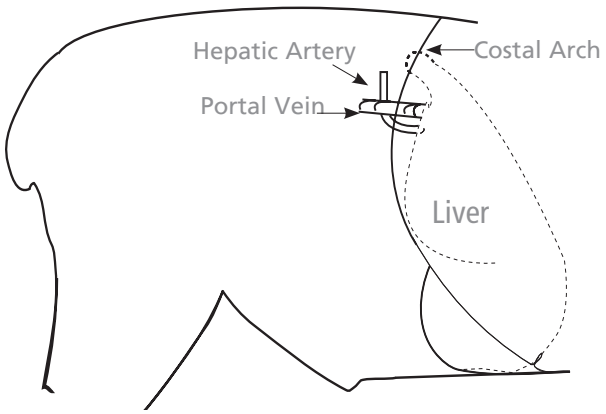
Place anesthetized sheep in left lateral recumbency and make a 15 cm skin incision through the skin and subcutaneous tissues 2 cm caudal to the last rib. Continue the incision through the external abdominal oblique, the internal abdominal oblique and the transverse abdominal muscle.

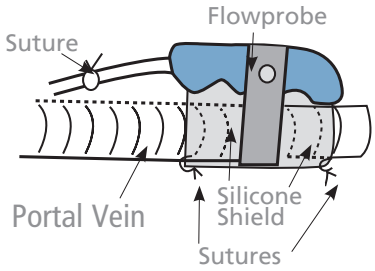
Trace the tissue between the caudate and right lobes of the liver to locate the portal vein. Free a 3 cm segment of the vein from surrounding tissue taking particular care to remove fat for proper acoustical coupling. Separate the U bracket from the body of the Flowprobe and pass the U bracket around the artery, reposition the body to align with the U bracket and secure both screws. Prevent rotation of the Flowprobe by suturing the cable to the connective tissue around the vein. Suture the silicone shield to perivascular tissue to ensure Probe stability.

Make a stab incision in the abdominal wall dorsal to the original incision. Continue the exit path with a subcutaneous tunnel to an exit incision over the flank. Close the peritoneum and transverse abdominal muscles with a simple continuous pattern of #1 absorbable suture. Close the internal and external abdominal oblique muscle individually in the same manner. Close the skin with simple interrupted sutures.

transonic
THE MEASURE OF BETTER RESULTS.

Sheep Portal Vein: Chronic Blood Flow Measurement Cont.





ACKNOWLEDGEMENT

Surgery and Total Hepatic Flow Trace

Mr. Bud Reulein and the late Dr. Emmett Bergman, Department of Physiology, New York State College of Veterinary Medicine, Cornell University, Ithaca, NY 14853

Portal Flow Trace

Mr. Steve Neutze, New South Wales Agriculture and Fisheries, Glenfield, New South Wales, 2167

REFERENCES

Neutze SA, Forbes WA, Oddy VH, Gooden JM, "Diurnal Variation in Oxygen Uptake by the Portal System of the Sheep," Proceedings of the Nutrition Society of Australia 1989; 14: 120.

Neutze SA, Forbes WA, Oddy VH, Gooden JM, Edwards SR, Nandra KS, "Calibration of an Ultrasonic Blood Flow Meter in the Sheep," Proceedings of the Nutrition Society of Australia 1989; 14:146, 1989.

transonic
THE MEASURE OF BETTER RESULTS.
www.transonic.com

Transonic Systems Inc. is a global manufacturer of innovative biomedical measurement equipment. Founded in 1983, Transonic sells "gold standard" transit-time ultrasound flowmeters and monitors for surgical, hemodialysis, pediatric critical care, perfusion, interventional radiology and research applications. In addition, Transonic provides pressure and pressure volume systems, laser Doppler flowmeters and telemetry systems.

AMERICAS
Transonic Systems Inc.
34 Dutch Mill Rd
Ithaca, NY 14850
U.S.A.
Tel: +1 607-257-5300
Fax: +1 607-257-7256
support@transonic.com

EUROPE
Transonic Europe B.V.
Business Park Stein 205
6181 MB Elsloo
The Netherlands
Tel: +31 43-407-7200
Fax: +31 43-407-7201
europe@transonic.com

ASIA/PACIFIC
Transonic Asia Inc.
6F-3 No 5 Hangsiang Rd
Dayuan, Taoyuan County
33747 Taiwan, R.O.C.
Tel: +886 3399-5806
Fax: +886 3399-5805
support@transonicasia.com

JAPAN
Transonic Japan Inc.
KS Bldg 201, 735-4 Kita-Akitsu
Tokorozawa Saitama
359-0038 Japan
Tel: +81 04-2946-8541
Fax: +81 04-2946-8542
info@transonic.jp