

# T400-Series Surgical Protocol

## Horse Uterine Artery: Acute Blood Flow Measurement

### APPLICATION BASICS

Site:	Middle Uterine Artery
Species:	Horse
Weight:	500 kg
Duration:	Acute
Vessel Diameter:	5 - 7 mm

### PROBE

Size:	8 mm
Reflector:	L with sliding cover
Cable Length:	60 cm
Catalog #:	MA-8PSS-LS-WC60-CRA10-GA

### FLOWMETER

TS420 Perivascular Module

### Flow Ranges Observed

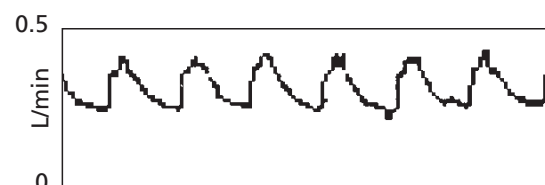


Fig. 1: Mean uterine flow in the anesthetized thoroughbred mare was 350 ml/min.

### ACKNOWLEDGEMENT

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## Application

This protocol was developed as part of a investigation on fetal and maternal relationships in parturition in the mare. Horses undergoing surgery often have circulatory complications such as perfusion mismatches, ischemic myopathy and low blood oxygen levels. In pregnant mares, emergency surgery is commonly associated with premature parturition and increased foal mortality.

In this study, uterine blood flow was measured in late pregnancy mares undergoing abdominal surgery for fetal instrumentation. This data was used intraoperatively to monitor the effects of the mare's positioning and the length of time under anesthesia. Comparisons were also made between different anesthetic agents such as isoflurane and halothane. This technique will also be used to characterize the interactions between uterine blood flow and common therapeutic agents such as altrenogest, clenbuteral, oxytocin and flunixin-meglumine.

## Surgical Approach

Tranquilize the horse with 0.02 mg/lb acepromazine and induce anaesthesia with thiamylal-guaifenesin solution administered intravenously to effect (approximately 0.5 ml/lb). This solution contains 2 grams of thiamylal mixed into 1000 ml of 5% guaifenesin solution. Position the mare in dorsal recumbency and maintain anesthesia by controlled ventilation with oxygen and halothane or isoflurane. Administer sodium penicillin (10,000 IU/kg) and Gentacin (IM) preoperatively.

Make a ventral midline incision from a point 6 cm cranial to the umbilicus to the udder with electrocautery. Continue the incision through the subcutaneous tissues with a #10 blade and enter the peritoneum. Identify the nonpregnant horn of the uterus by palpation and manipulate the uterus to expose the middle uterine artery. Dissect free the covering fascia to mobilize a short (1-2 cm) segment of the artery.

Pass the L bracket of the Probe around the middle uterine artery. Close the slide and secure the screw. Remove the plunger of a 30 cc syringe and load with sterile surgical lubricating gel, taking care to prevent the formation of air bubbles. Place a flexible catheter on the tip of the syringe. The catheter may be inserted into the Probe's acoustic window adjacent to the vessel and the gel deposited as the syringe is withdrawn.

*(Continued on next side.)*

## Horse Uterine Artery: Acute Blood Flow Measurement Cont.

### Surgical Approach cont.

To verify that signal amplitude is above 0.6 V, press the test mode button on the Meter. A low signal or an acoustic error can usually be traced to an insufficient amount of lubricating gel or an air bubble. If the artery fills most of the acoustic window, surface tension will keep the acoustic couplant between the vessel and the Flowprobe and the uterus may be returned to the abdomen while other procedures are performed. When fetal surgery is included in the protocol, it is suggested that ampicillin be administered directly to the fetus before closing.

When all procedures are completed, remove the Flowprobe and close the abdomen with #3 vicryl. Appose the subcutaneous tissues with #0 vicryl and staple the skin. Post operative care consists of appropriate antibiotics.

### REFERENCES

#### Other Species, Uterine Artery

Fishburne JI, Dormer KJ et al, "Effects of Amrinone and Dopamine on Uterine Blood Flow and Vascular Responses in the Gravid Baboon," Am J Obstet Gynec 1988; 158: 829-837..

Baumann A et al, "Maternal and Fetal Effects of Milinone and Dopamine," Am Soc Anes Abstr 1989; 71(3A): A854.

Akagi K et al, "Ultrasonic Transit-Time Measurement of Blood Flow in the Animal Chronic Preparation Model," Jpn J Med. Ultrasonics 1987; 14(2): 26-32.

#### Horses, Other Organs

Clark ES et al, "The Effects of Xylazine Administration on Cecal Mechanical Activity and Cecal Blood Flow in Healthy Horses," Am J Vet Res 1988; 49(5): 720-721..

Clark ES, Moore JN, "The Effects of Dopamine Administration on Cecal Mechanical Activity and Cecal Blood Flow in Conscious Healthy Horses," Am J Vet Res 1989; 50(7): 1084-88.



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