

# BLF22 Surgical Protocol

## Perfusion Measurement in the Rabbit Ear

### APPLICATION BASICS

Site: Ear  
 Species: Rabbit, New Zealand white male  
 Weight: 3.5 - 4 Kg  
 Duration: Acute  
**PROBE TYPE:** DI: disk

### TYPE DI (ABLPDI)



Head: epoxy,  
 Diameter: 12 mm  
 Height: 3 mm

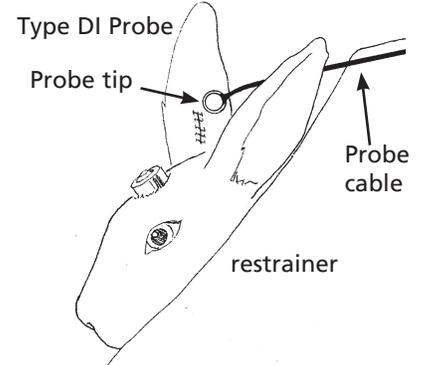


Fig. 1: Laser-Doppler Probe shown on the dorsal surface of the rabbit ear. Note: Suture on the ear and anchored connector on the cranium for transit-time ultrasound Probe around the auricular artery.

### Application

The rabbit ear is used as a longitudinal model for the study of human digital pathophysiology.

### Surgical Approach

1. Place the rabbit in a restrainer.
2. Gently shave a small patch on the dorsal surface of the ear. Do not use depilatory agents as these can cause skin irritation and consequently affect the perfusion in that area.
3. Attach the Probe to the shaved area using double adhesive circles. Support the cable so as to relieve the weight of the cable and Probe head. Provide the rabbit with a non-threatening view, and do not walk into view of the rabbit for a period before or during the experiment as anxiety has a significant impact on blood flow to the ear.
4. Use a chronically instrumented rabbit with a transit-time ultrasound Flowprobe on the auricular artery and catheters in the femoral artery (blood pressure in the abdominal aorta) and vein (IV administration of vasoactive substances) to allow comparison of total and peripheral ear blood flow.

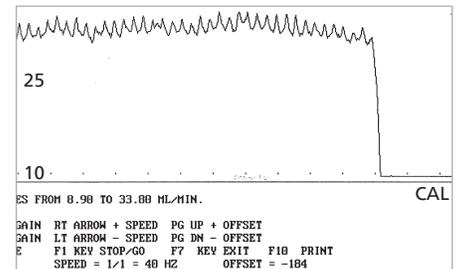


Fig. 2: Cutaneous microvascular perfusion in the rabbit ear by laser Doppler flowmetry, recorded with Transonic's FlowTrace® software.

### PERFUSION RANGES OBSERVED

CONDITION	PERFUSION: TISSUE PERFUSION UNITS (TPU)
Baseline	~ 15-30 TPU
with Clonidine (0.75 µ/kg. IV)	~ 2 TPU
with Norepinephrine (0.75 µ/kg. IV)	~ 4 TPU
with Phenylephrine (6 µ/kg. IV)	~ 1 TPU

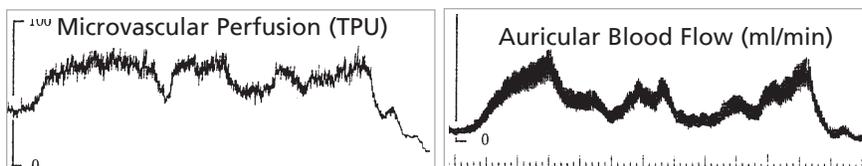


Fig. 3: Thermoregulation causes parallel microvascular perfusion (laser Doppler) and auricular blood flow (T206 with 1RB Probe, Transonic®) changes.

### ACKNOWLEDGEMENT

Protocol and data courtesy of Dr. Tom L. Smith, Wake Forest University Health Science Center

### REFERENCES

Smith TL, Korman L, "Development of a New Rabbit Ear Model for Longitudinal Study of Digital Pathophysiology," *Microsurgery* 1992; 13:325-331.

