**BLF22 Surgical Protocol**

**Bronchotracheal Perfusion Measurement in Sheep**

**APPLICATION BASICS**

<table>
<thead>
<tr>
<th>Site:</th>
<th>Tracheobronchial wall</th>
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<tbody>
<tr>
<td>Species:</td>
<td>Sheep</td>
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<tr>
<td>Weight:</td>
<td>36 - 61 kg</td>
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<tr>
<td>Duration:</td>
<td>Acute</td>
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**PROBE TYPE:** E with modification: a rigid sleeve is applied one inch from the end, forming a permanent 45º angle in the flexible teflon coated endoscopic cable.

**Type E** (Endoscopy) (ABLPHE)

- Diameter: 1.8 mm
- Head: Teflon coated cable with 1 mm titanium disc at tip of endoscopy segment; Length: 2 meters
- Cable: flexible; 2 meters
- Total length: 4 meters

**Application**

A technique for diagnosing inhalation injury in the early post-burn phase. After smoke insufflation of the right lung, the following blood flow measurements were obtained: right lung: 51.7 ± 2.1 TPU; left lung, unchanged from baseline.

**Surgical Approach**

1. Anesthetize the animal with ketamine (5 mg/kg).
2. Perform a tracheostomy, insert a 10 mm tracheostomy tube and connect to a ventilator. Ventilate with a tidal volume of 15 ml/kg and a positive end expiratory pressure of 5 cm H₂O. Maintain end-tidal carbon dioxide between 30 and 35 mmHg by adjusting the respiratory rate and the minute volume. Maintain anesthesia with halothane at 2 - 3% when the effect of the ketamine wears off. Adjust halothane anesthesia to maintain mean arterial pressure of 80 mmHg.
3. Insert the Laser-Doppler Probe through the tracheotomy tube and place it at the mucosal surface of the wall of the second generation bronchi. Verify positioning of the Probe by bronchoscopy.
4. Verify that the Probe is not putting pressure on the tissue by:
   - Connecting the Probe to the Tissue Perfusion Monitor and observing the Monitor reading.
   - Press the probe against the tissue.
   - Then, in successive small steps, move the Probe back from the tissue, reducing the pressure. After each step, wait for the motion artifact to dissipate and then note the reading. Continue the steps until the reading no longer increases (indicating that the vessels are not occluded by pressure from the Probe).
5. Record the flow on a chart recorder or computer using the analog or digital ports on the Tissue Perfusion Monitor or manually record the high, and low values from the front panel during a 30-second period and average the values.
Bronchotracheal Perfusion Measurement in Sheep cont.

Perfusion Ranges Observed

<table>
<thead>
<tr>
<th>SECOND GENERATION BRONCHUS WALL</th>
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<tbody>
<tr>
<td>Right Lung</td>
<td>35.1 ± 2.6 TPU</td>
</tr>
<tr>
<td>Left Lung</td>
<td>35.1 ± 2.6 TPU</td>
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</tbody>
</table>

ACKNOWLEDGEMENT

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REFERENCES
