Volume Flow with 4 & 6 mm COnfidence Probes

Blood Flow - the Heart of the Matter

Whatever the nature of a defect, the primary goal of pediatric surgery is to create or restore blood flow to traverse its normal circulatory route through the lungs and heart and into the systemic circulation so that a child can grow and thrive.

After surgery, waiting for symptomatic acknowledgement of surgical success is anxiety-provoking, time-consuming and subjective. When blood flow is measured directly during the surgery to determine single flows or Qp/Qs, surgeons have the opportunity to make immediate, necessary revisions before closing the patient.

Transonic’s intraoperative measurements may either confirm a surgeon’s clinical impression during the course of the surgery, or they can alert the surgeon to a potential problem when it can be most easily addressed.

A Direct Measure of Volume Flow through the Aorta & Pulmonary Artery to Determine Qp/Qs

To Measure Is to Know

The size and fragility of pediatric patients make their surgeries among the most challenging to perform. Topping the list of challenging pediatric surgeries is repair of hearts of children born with congenital defects (CHD). Extending open-chest periods and staged surgeries add to the importance of knowing how much blood is flowing through re-directed pathways.

Since 1988, Transonic flow measurements have been used by flow innovators such as Dr. Constantine Mavroudis to develop procedures such as the fenestrated Fontan for pediatric heart repair.

Now Transonic’s four-crystal AU Confidence Flowprobes that measure turbulent flow through great vessels have been sized for pediatric hearts. The small 4 & 6 mm Flowprobes offer immediate and highly accurate measurements of volume flow through the tiniest vessels.
Continuous Measurements

Determining QP/QS during Pediatric Surgery with Flow-Assisted Surgical Technique (F•A•S•T)

Measuring Flow

1. Expose & identify vessels to be measured

2. Select correct Confidence Flowprobe size
   Measure the diameters of the vessels to be measured with a gauge before opening the Flowprobe package. Select a Flowprobe size so that the vessel will fill between 75% - 100% of the Flowprobe's ultrasonic sensing window.

3. Prepare Vessel for Flowprobe
   Determine the optimal position for applying the Flowprobe by selecting a site wide enough to accommodate the Flowprobe's body. Clear approximately 1 cm of the vessel to be measured of extraneous tissue (i.e. fascia, fat). Fat could interfere with acoustic transmission.

4. Add Couplant to Flowprobe
   Apply ultrasonic gel to the inside of the liner. Then apply gel to the inside of the probe shell.

5. Apply Flowprobe
   Position the liner on the vessel. Place the probe shell over the liner. Position the Flowprobe on the vessel so that the entire vessel lies within the ultrasonic sensing window of the Flowprobe.

6. Check Signal Strength
   Check the Flowprobe's signal strength on the Flowmeter's Signal Quality Indicator. If acoustic contact falls below an acceptable value, an acoustic error message will be displayed. Apply more gel, if needed.

7. Multi-stage Flow Measurements
   a. Measure Flows In Situ
      Measure baseline flows.
   b. Measure Flows, as needed, throughout the course of surgery
   c. Final Flow Measurement
      Measure flows at completion of surgery
      Note: Probes can be left on the vessel for up to 24 hours.

5. Document Multi-stage Flows for Case Record
   Document flow values from the multi-stage flow assessments. If the Flowmeter displays a negative flow, press the INVERT button to change the polarity before printing the waveform.

F•A•S•T Medical Notes are intended to assist in surgical decision-making and are not diagnostic tools. Surgical interpretation is required.
Why rely on guesswork and intuition, or wait until postoperative conditions determine surgical success? Transonic Optima® Flowmeters provide immediate, quantitative flow measurements with unsurpassed accuracy and resolution. Make intraoperative flow measurements with a Transonic Flowmeter part of your routine to verify establishment of adequate blood flow before closing your patient.

The Optima Flowmeter complements a full line of Perivascular Flowprobes for vessels from 0.5 mm to 36 mm in diameter and Tubing Flowsensors for any size tubing.
References


6. Sharp MK et al, “Aortic Input Impedance in Infants and Children,” J Appl Physiol. 2000; 88(6): 2227-39. (Transonic Reference # 2590AH) Flow and pressure measurements were performed in the ascending aortas of six pediatric patients ranging in age from 1 to 4 yr and in weighing from 7.2 to 16.4 kg