

# Ithaca Marketing Dispatch January 2020

Michael Bell, Debbie Brouwer-Maier, Tim Callahan, Sierra Coyle, Susan Eymann, John Haberstock, Cole McLarty, Anna Mueller, Erin Perkins, Margo Sosa, Danielle Senador, Miriam Tenorio

## Mkt. Activities

- Sierra Coyle: attended ELSA launch in Taiwan. Visited National Taiwan University Pediatric Hospital and Chang Gang Memorial Hospital Pediatric ICU for substantive ECMO discussions. Also attended the Annual Taiwan ELSO meeting at the National Taiwan University.
- Harnessing Q Booklet finalized for distribution.
- Ithaca Employee Directory updated for 2020. Contact Mary Ellen Albrecht for a copy.
- Pub Briefs:

**Ryu YG et al**, "Clinical Value of Intraoperative Transit-Time Flow Measurement for Autogenous Radiocephalic Arteriovenous Fistula in Patients with Chronic Kidney Disease," **Matsuda K et al**, "Long-Term Survival for Hemodialysis Patients Differ in Japan Versus Europe and the USA. What Might the Reasons Be?" **Ballestin A et al**, "Ischemia-reperfusion injury in a rat microvascular skin free flap model: A histological, genetic, and blood flow study," and others generated and added to [www.transonic.com](http://www.transonic.com) under their respective Resources.

## January Tradeshow

Society of Thoracic Surgeons  
56th Annual Meeting &  
Exhibition: January 25 - 28,  
2020, New Orleans, Louisiana

## Hubspot Stats

[www.transonic.com](http://www.transonic.com)

- December Visits: 15,752 (up 13% from the previous month);
- New Contacts: 312 (up 70% from the previous month)
- Blogs: 8 new blogs added in December; 6,004 views (up 6% from December)

## Partner Portal

Find manuals & sales resources on [www.transonic.com](http://www.transonic.com) **Partner Portal**. Contact Anna Mueller for login assistance.



Happy Holidays to you, your family and friends. It is hard to believe another year has flown by already. I am sure that the "speed of the years" is a direct correlation to the number of exciting growth opportunities and projects to help accelerate our business growth that we all are working on! None of this could be realized without the hard work and commitment of all of you, "Team Transonic"! I wish you all Happy Holidays and warm wishes for the 2020! Cor Drost, President

## Studies Advocate the Value of Intraoperative Flow Measurement during Vascular Access Fistula Creation

Although fistulas are acknowledged as being the optimum vascular access for hemodialysis, their use is limited by the high percentage of fistulas that do not mature for use as an access. Fistula maturation is influenced by a complex interaction of different demographic, hemodynamic, and technical factors including surgical expertise. The DOPPS study with data from 12 countries showed that the risk of fistula failure was 34% lower when the fistula was applied by surgeons who had created more than 25 fistulae.<sup>1</sup>

A number of publications advocate use of intraoperative flow measurements to foreshadow fistula maturation. One recent study entitled "Clinical Value of Intraoperative Transit-Time Flow Measurement for Autogenous Radiocephalic Arteriovenous Fistula in Patients with Chronic Kidney Disease," from Korea University's Guro Hospital, in Seoul measured flow in 187 radiocephalic fistulas immediately after their construction.<sup>2</sup> They found hemodialysis was maintained in 77.5% of the patients by using the established AVF. The mean flow from the radial artery to the cephalic vein was  $199.8 \pm 92.7$  mL/min; PI was  $0.57 \pm 0.16$ . The time to first hemodialysis with an established AVF after surgery

was  $61.0 \pm 22.7$  days and that this time correlated to mean flow and PI.

From their data the clinicians concluded that intraoperative transit-time flow measurements which are non-invasive, easy to use, and reproducible, are valuable for the assessment of the quality of established arteriovenous fistulas. Another recent study concluded that the predictive value of intraoperative flow measurement is superior to intraoperative physical examination.<sup>3</sup>

### REFERENCES

1. Saran R et al, "Enhanced training in vascular access creation predicts arteriovenous fistula placement and patency in hemodialysis patients: results from the Dialysis Outcomes and Practice Patterns Study. *Ann Surg* 2008; 247(5): 885-891.
2. Ryu YG et al, "Clinical Value of Intraoperative Transit-Time Flow Measurement for Autogenous Radiocephalic Arteriovenous Fistula in Patients with Chronic Kidney Disease," *Ann Vasc Surg*. 2016 Aug;35:53-9 (Transonic Reference # VA10972AH).
3. Meyer A et al, "Determinants of successful arteriovenous fistulae creation including intraoperative transit time flow measurement," *J Vasc Access*. 2019 Oct 17;(Transonic Reference # VA11594AH)
4. Johnson CP et al, "Prognostic Value of Intraoperative Blood Flow Measurements in Vascular Access Surgery," *Surgery* 1998; 124: 729-38.(Landmark study)
5. Berman SS et al, "Predicting Arteriovenous Fistula Maturation with Intraoperative Blood Flow Measurements," *J Vasc Access*. 2008; 9(4): 241-7.

# Ithaca Marketing Dispatch January 2020

Michael Bell, Debbie Brouwer-Maier, Tim Callahan, Sierra Coyle, Susan Eymann, John Haberstock, Cole McLarty, Anna Mueller, Erin Perkins, Margo Sosa, Danielle Senador, Miriam Tenorio

## CO and Stroke Volume

**Cardiac Output (CO)**- the average volume of blood the heart's left ventricle ejects into the systemic circulation each minute, measured in liters per minute (L/min); equals Stroke Volume times Heart Rate.

**CO = Stroke Volume (SV) x Heart Rate (HR)**

- **Typical CO Range:** 5 - 8 L/min
- **Atypical CO Range:** <2 and > 10 L/min
- **Clinical Relevance:** indicates increased risk for cardiovascular complications and failure.
- **Interpretation:** CO varies by patient parameters and is used to calculate AF/CO ratio.

SV is determined by a heart's preload, afterload and contractility.

**Preload** is the filling volume of left ventricle at diastole. Preload is used to assess the fluid conditions that help clinicians make proper decisions on whether or not to infuse fluids. Preload depends on the amount of myocardial fiber stretch at the end of diastole (heart is full of blood and ready to contract). It is the pressure stretching the ventricle of the heart, after passive filling and atrial contraction. Preload is affected by venous blood pressure and the rate of venous return. Two preload parameters are Central Blood Volume (CBV) and Total End Diastolic Volume (TEDV) each of which is normalized as an index CBVI and TEDVI.

**Afterload** is the resistance, impedance, or pressure that the ventricle must overcome to eject its blood volume or the tension produced by a heart's chamber in order to contract. Afterload is largely dependant on aortic pressure. The most sensitive measure of afterload for the left ventricle is Systemic Vascular Resistance (SVR). Active Circulating Volume (ACV) correlates to SVR

**Contractility** is the intrinsic ability of a cardiac muscle fiber to contract at a given fiber length. Contractility is difficult to measure directly in the clinical setting. Inotropes are pharmacologic agents that affect contractility. If Preload and Afterload remain constant, then Stroke Volume is explained by Contractility.

## Flow Measurement Handbook for Industry Bioengineers Released. Student Bioengineering Handbook to Follow

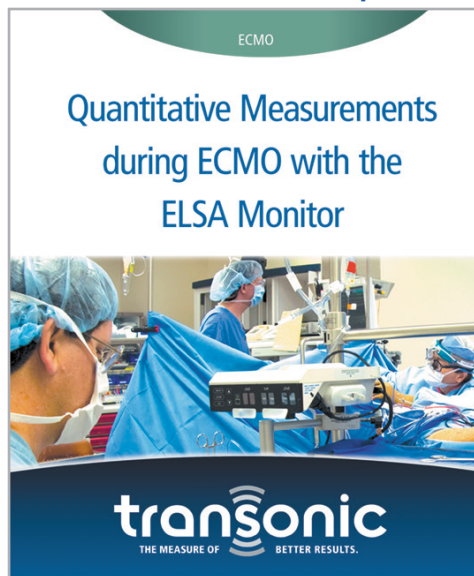
**Harnessing Q (Flow):** A Flow measurement Guide presents information for industry bioengineers interested in the development of medical instrumentation. The handbook begins with a short preface and overview of device development from bench to bedside including mock circulatory loops. Description of three measurement technologies: transit-time ultrasound, saline indicator ultrasound dilution and pressure volume loops is then presented. This technology section is followed by overviews of the various applications in which these technologies have and can be used. The last section in the body of the handbook addresses collaboration with Transonic: who Transonic is, and what its co-engineering offers including a listing of its impressive lineage of intellectual property (patents). The appendix then provides a section on calibration, a review of flow dynamic terms, and Flowsensor specifications.

Harnessing Q is currently being modified with pertinent information targeted to bioengineering students.



It includes new chapters on cardiovascular physiology and building blocks for instrumentation as well as a comprehensive glossary of flow and related technology terms. For more information contact: [John.Haberstock@transonic.com](mailto:John.Haberstock@transonic.com)

## ELSA Handbook Captures ELSA's Quantitative Capabilities



Transonic's ultrasound dilution technology, the recognized gold standard for hemodialysis vascular access flow measurements, has now been refined to provide valuable hemodynamic data at the bedside of critically ill ECMO patients with the ELSA® (Extracorporeal Life Support Assurance) Monitor.

The body of the handbook includes chapters on ELSA's measurement theory, ELSA measurements and their benefits for optimizing pump flows, quantifying recirculation and oxygenator blood volumes and seven publication briefs of ELSA/ECMO papers. The handbook's appendix has a glossary of ECMO terms and a technical note on minimizing infection risk.

Download the handbook at: [www.transonic.com/resources/extracorporeal/Quantitative-Measurements-during-ECMO-with-the-ELSA-Monitor](http://www.transonic.com/resources/extracorporeal/Quantitative-Measurements-during-ECMO-with-the-ELSA-Monitor)