Competition Comparison

Transonic® Flow-QC® Hemodialysis Monitoring

COMPARISON WITH FRESENIUS ON-LINE CLEARANCE (OLC) MONITORING

THE GOLD STANDARD

Transonic® Flow-QC® ultrasound dilution technology is the recognized gold standard for dialysis patient management. Its novel capability to measure 0% recirculation and direct vascular access flow influenced creation of the first comprehensive evidence-based guidelines for dialysis adequacy and access patency to effect continuous quality improvements in hemodialysis. These National Kidney Foundation’s Kidney Disease Outcomes Quality Initiatives (K/DOQI) now set industry standards for early identification of failing accesses to improve patient outcomes.

In hemodialysis clinics throughout the world, Transonic® Flow-QC® has become the cornerstone for vascular access management programs. Its selection is backed by more than 400 independent, peer-reviewed clinical studies that cite Transonic’s ultrasound dilution as the technology of choice for routine monitoring and clinical studies of fistulas and grafts.

FLOW-QC® BENEFITS

Transonic® Flow-QC® quickly and efficiently delineates patients based on their access flow measurements. Earmarking patients with low access flows or a drop of access flow greater than twenty-five percent over four months, as recommended by the K/DOQI, enables timely referrals for intervention. It averts the false positives of other technologies that can send a patient with a well-functioning access for a fistulogram. This predictive power of Transonic access flow monitoring has been substantiated by leading nephrologists including Tonelli, Schwab, May, Neyra, Tessitore, Bosman, Hakim, Murray, and others.

Access flow measurements also verify and document outcomes from corrective interventions, including balloon angioplasty, stenting and surgery. Murray et al reported that preemptive angioplasty of graft stenosis resulted in an initial twofold increase in access blood flow. Furthermore, Transonic® Flow-QC® Monitoring extends the life expectancy of hemodialysis patients by preserving future access sites, decreasing the use of catheters and reducing access thrombosis.

From an economic standpoint, implementation of Transonic® Flow-QC® Monitoring is also worthwhile. Patients generate clinic revenue. When a vascular access management program keeps patients healthier for longer periods of time, fewer dialysis treatments are missed due to vascular access malfunction and there are fewer hospitalizations. McCarley’s Renal Care Group and Vanderbilt University landmark study reported that Transonic® access flow monitoring benefits both the patient and clinic by reducing access-related morbidity and hemodialysis costs by close to 50%.

COMPARISON WITH FRESENIUS OLC

While hundreds of peer-reviewed publications support Transonic’s Flow-QC®’s clinical and economic benefits, only a few studies report use of the Fresenius’ On-line Clearance Monitor (OLC) for vascular access monitoring. No peer-reviewed full validations support its accuracy, reliability or reproducibility.

A side-by-side study at a large single center, analyzed a total of 290 paired Transonic® Flow-QC® and Fresenius OLC access flow measurements from 145 patients taken over two consecutive weeks. The analysis determined that a majority of Fresenius (conductivity dialysate) measurements were more than 10% different from Transonic® Flow-QC® measurements and 28% of the measurements were more than 20% different. Furthermore, in 46% of the patients, the Fresenius access flow measurements differed from one another by more than 20% from one week to the next. The authors concluded, “the Fresenius method of measurement of AV fistula Qa does not reliably reproduce the Qa measured by the Transonic method.”

Such accuracy flaws seriously call into question the clinical validity of Fresenius OLC measurements. In addition, OLC has limited features and monitoring capability (see table on back). In contrast, the Transonic® Flow-QC® offers a complete, economical stand-alone system with built-in quality safeguards for monitoring dialysis adequacy, vascular access flow and cardiac output. "The method of choice for access flow measurement is by ultrasound dilution technology."
TRANSONIC ULTRASOUND DILUTION MONITORING

THE GOLD STANDARD

COMPLETE MONITORING SYSTEM FOR

- Dialysis Adequacy
- Delivered Blood Flow
- Recirculation: true access recirculation independent of cardiopulmonary recirculation. K/DOQI guidelines state that anything >0% is abnormal.
- Vascular Access Flows from 100 ml/min to 4 L/min.
- Cardiac Output to provide nephrologists with early indications of deteriorating cardiac conditions so that treatment can be initiated immediately.

QUALITY SAFEGUARDS IN STAND-ALONE SYSTEM
Prevents operator error and offers flexibility of use, allowing clinicians to monitor any patient at any time.

- Monthly surveillance takes only 5 minutes per patient.
- A built-in alert function warns the access coordinator when a patient is at risk for vascular access stenosis.
- Automated trending of patients’ access flows supports compliance to K/DOQI Guidelines, saves staff time, and enables immediate response to critical access problems.
- Automatic data storage provides back up documentation to support on-going patient therapy.

COST EFFECTIVE
One Transonic unit services one large or multiple small dialysis clinics so that a clinic can economically implement an access patency management program for all patients in a clinic.

- One trained “Access Coordinator” can measure and track access patency and dialysis adequacy for an entire clinic, and also offer first response to patient access problems.

MORE COSTLY TO IMPLEMENT

- A number of OLC units, one per dialysis machine, must be purchased to service an entire clinic.
- An access flow measurement takes 25 minutes, restricting the ability to confirm suspicious readings by repeating the measurement in a reasonable amount of time.
- Clinical utility of OLC flow measurements require averaging a number of measurements taken during the first hour of dialysis over multiple days.
- Discrimination of access problems involves third party data tracking and analysis.

FRESENIUS ON-LINE CLEARANCE MONITORING

LIMITED PUBLICATIONS14
No independent peer-reviewed clinical studies substantiate routine clinical use. Can’t detect a 25% decrease in access flow over a 4-month period (K/DOQI Guideline). OLC has only limited value for detecting Qa drop below 600 ml/min (in situations where lower sensitivity and specificity is acceptable). OLC flow readings may fluctuate over 25% with no changes in patient access flow.2 Fresenius OLC surveillance to manage patients under K/DOQI trending rules, can result in many “false positives” where the patient can be referred for a fistulogram and intervention because the machine has erroneously signaled an access problem.

LIMITED MONITORING CAPABILITY
Questionable OLC measurement accuracy can cause patients with vascular access stenosis or cardiac overload to be overlooked.

- Only measures access flow up to 2000 ml/min. Therefore OLC does not identify high access flow rates that expose patients to greater risk. (Abnormally high access flow is a prime source for cardiac complications and patient mortality.)
- Does not measure cardiac output.
- Access recirculation measurements are influenced by cardiopulmonary recirculation. This may lead to false access recirculation readings >0%, that will indicate an access problem when, in fact, there may be none.

CLINICAL LIMITATIONS
OLC is compatible only with Fresenius 2008H and 2008K dialysis machines and can only be used on one patient per shift per machine.

- Fails to detect patients at risk of vascular access thrombosis
- No trending capability.
- No data storage capability for future retrieval.
- Patient is dialyzed with blood lines reversed for extended periods.

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References