



Noninvasive Medical Technologies

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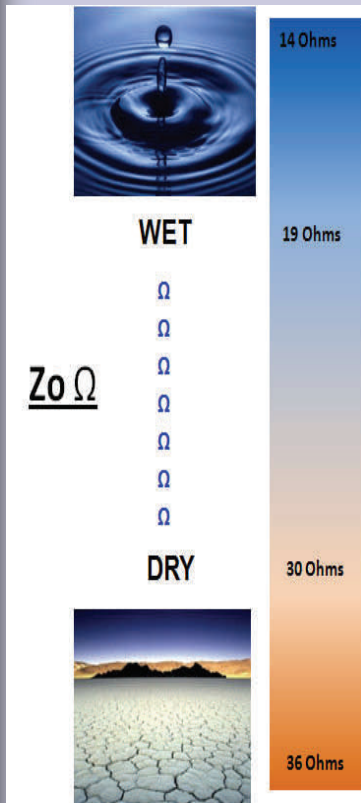
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A 2 ohm decrease from the person's baseline Zo within 24 hours dictates notification of a medical professional

ZOE® Report

Correlation of Thoracic Impedance (Zo) with Markers of CHF Pulmonary Artery Diastolic (PAD) Pressures and CXR

Robert Steele, M.D. & Kevin Ferguson, M.D.

Objective:

Compare (Zo) thoracic impedance to known markers of CHF. We compared Zo to degree of CHF and CXR and Pulmonary Artery Diastolic Pressure (PAD)

Introduction:

How do we assess critical patients in compensated shock? How do we manage their fluid status or pressors? How do we determine when cardiac output is sufficient? Until now we have required a Swan Ganz catheter to assess and treat these patients. How can we improve in this area? These are the types of questions we are trying to answer in a noninvasive manner. With this study we are trying to establish parameters for noninvasive hemodynamic monitoring. Once parameters are established we will be able to utilize this new noninvasive technology.

Methods:

A prospective correlation study at an urban teaching hospital. Using convenience sampling of 46 post open heart patients with pre-existing Swan-Ganz catheters were evaluated. Zo was measured using an IQ 2000 (Renaissance Technology) and Pulmonary Artery Diastolic pressure from the Swan-Ganz catheters. A post-op chest x-ray was used to define class of CHF. Class of CHF was determined by a radiologist blinded to other measurements. Measurements were performed with the initial hemodynamics, immediately following CXR. The Zo, CHF grade, and PAD were recorded for each patient. Data is analyzed using ANOVA, Student Nueman Kuels, and Pearson's correlation analysis. Significance was assigned at p<0.05.

Conclusion:

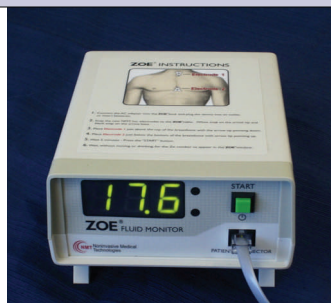
The data confirms correlation between Zo and class of CHF. There is a weaker correlation between Zo and PAD. This information will help to establish parameters for noninvasive hemodynamic monitoring.

St. John Hospital Medical Center Department of Emergency Medicine affiliated with Wayne State University

See next Issue for Follow on Study.

To Review Entire Study Please Contact Noninvasive Medical Technologies, Inc.

ZOE® gets
a
'Face Lift'



NOW AVAILABLE:
ZOE® Cleansing Wipes
ZOE® Instructional DVD

Zo, Objective Early Identification of HF Exacerbation

Wouldn't it be great if an objective tool existed to identify a patient's fluid status changes prior to subjective signs and symptoms of heart failure exacerbation?

Wouldn't it be great if there was a tool that detected imminent weight gain, swelling or shortness of breath several days before these symptoms occurred so that clinicians could intervene early enough to avoid a trip to the hospital?

Thoracic Zo, or thoracic base impedance, is an objective measure that has been shown to objectively identify fluid changes associated with HF exacerbation prior to symptom development. This measure has been used by clinicians and hospital for 15 years as a quick, noninvasive method for determining whether patients are experiencing fluid congestion or dehydration. The ZOE[®] Fluid Status Monitor, manufactured by Noninvasive Medical Technologies, provides objective data that guides early intervention of heart failure exacerbation, as well as other conditions that battle fluid problems

Previously available only as part of a multi-function noninvasive hemodynamic monitor used in institutional care, known as the IQ, the portable ZOE[®] monitor weighs less than one pound and is intended for outpatient and home use.

Research indicates that measuring Zo can predict congestion in heart failure cases as early as two weeks prior to weight gain and other symptoms such as edema or shortness of breath. Clinicians have more time to assess reasons behind the symptomatic changes and work with patients to change noncompliant behaviors and improved medication adherence. Often, they also consult with the patient's physician before having to resort to disruptive and costly emergent care or rehospitalization, to determine whether adjustments in the patient's treatment plan are indicated.

The ZOE[®] Monitor is FDA cleared and intended for use by qualified healthcare practitioners under the direction of a physician for monitoring of patient:

- Living with fluid management problems
- Taking diuretic medication
- Living with Heart Failure
- Living with End-Stage Renal Disease
- Recovering from a coronary artery disease related event
- Suffering from recurrent dehydration

Contraindications:

- Allergies to electrode hydrogel
- Skin sensitivities to electrode hydrogel
- Skin breakdown in areas on the chest where ZOE Monitor electrode placement is required.

Recipient of the 2008 Frost and Sullivan North American Award for Health Care Monitoring Innovation

One Patient's ZOE[®] Experience

Mrs. S is a 71- year-old woman with a primary diagnosis of HF and secondary diagnosis of insulin dependent diabetes. I interviewed Katherine, a home care nurse, after she had been monitoring Mrs. S with the ZOE[®] Fluid Status Monitors for six months.

Mrs. S's medications are the expected ones for someone with her diagnoses: insulin, a diuretic, potassium to counteract electrolyte loss from the diuretic, and a beta blocker. She has a very attentive husband who, though she playfully describes him as a man "any woman would die for," needs a lot of direction, education, and support when it comes to his caregiver duties.

Mrs. S was referred for in home monitoring after having been hospitalized several times for being "extremely wet" (fluid overload) and occasionally for being "dry" (dehydrated). Her home care provider knew she needed more ongoing monitoring than they could provide so they supplemented in person visits with services through their contract with Baseline Telehealth, Inc., the disease management company that employs Katherine.

Baseline provides telemonitoring in patient's homes, including ZOE[®] monitoring, and supplements nurses making in person visits with office based critical care nurses, who provide additional patient support, educations, and intervention as needed.

Six months after Katherine began to see Mrs. S, she told me, "I am happy to inform you that Mrs. S. has not been hospitalized since being with us and that the ZOE[®] monitor is very helpful in letting me know when Mrs. S needs to be careful with her diet, drink, or change in medications. The majority of the time she showed no symptoms but her Zo readings indicated problems were present. She would start to get compliant and her numbers would stabilize but then her numbers would increase, she would get dehydrated, but her weight did not change preceding an exacerbation event."

"When I realized that the ZOE[®] Monitor was giving me advance warnings, I started to rely on it all the time. Now, she gets a ZOE[®] Monitor reading every other day and I review it. I have been able to call Mrs. S when she is either too wet or dry, and simply instruct her and her husband over the phone on how to manage her therapeutic regimen in order to optimize and stabilize her health."

Caroyn Humphrey, RN, MS, FAAN

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