

# HHF - PROCEDURE

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ORIGINAL DATE: 11/06

REVIEWED DATE: 08/13

## **SUBJECT: ZO FLUID STATUS ASSESSMENT**

**PURPOSE:** To describe the clinical indications and use of the ZOE™ fluid status monitor.

### **Considerations:**

#### **Zo Measurement**

The ZOE™ Fluid Status Monitor was designed for monitoring fluid levels. The ZOE™ monitor measures thoracic base impedance, also known as Zo, which is a measurement of the time it takes a small frequency electric current to travel from the top to the bottom of the thorax. The more resistance the current meets, the drier or less fluid that exists and conversely, the less resistance that the current meets, the wetter or more fluid that exists in the chest. Normal thoracic Zo ranges between 19 and 30 ohms, however each person has their own baseline Zo value. Zo readings decrease when fluid increases and rise when less fluid exists in the chest.

Zo measurement is a quick and easy method for determining whether individuals are experiencing fluid congestion or dehydration. Research indicates that Zo is an early predictor of congestion in heart failure, showing decreases as early as two weeks prior to weight gain.

### **Clinical Indications:**

ZOE™ can be used to monitor individuals with:

- Fluid management problems
- Diuretic medications
- Heart failure
- Endstage renal disease
- Recent coronary artery events
- Recurrent dehydration

ZOE™ is contraindicated:

- When allergies to the electrode hydrogel exist
- When skin sensitivities to electrode hydrogel exist
- When there is skin breakdown in areas of the chest where ZOE electrode placement is required
- When a roach infestation in the patient's home is suspected

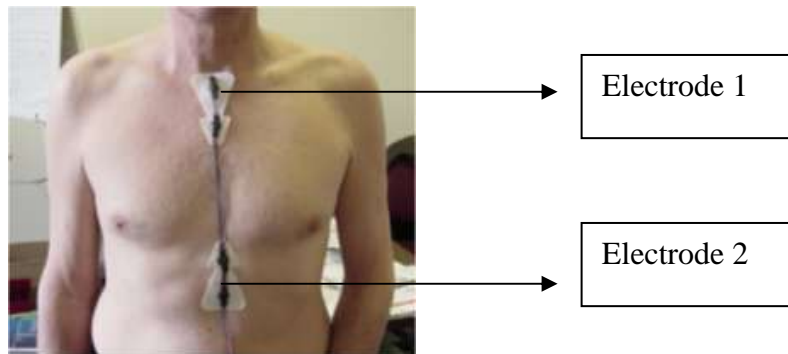
## **Procedures:**

- The clinician obtains a physician's order for Zo measurement. Zo parameters are determined by the physician.
- The clinician brings the necessary equipment to the patient's home, including:
  - ZOE™ Fluid Status Monitor kit, which contains the monitor, a cable, 2 sets of electrodes, a power pack, and a user manual.
  - Four AA alkaline batteries for back-up as needed.
  - Extra electrodes (one package needed per day)
- If the patient will be self monitoring, the Home Health VNA clinician instructs the patient on the installation and use of the equipment and reviews the user manual, which is left in the home for the patient.
- If the patient will be self monitoring, the Home Health VNA clinician reviews safety precautions, including:
  - Not allowing liquid to enter the ZOE Monitor case
  - Assuring that the cables are not kinked
  - Assuring that abrasives are never used on the device
  - Assuring that the device is placed on a solid, steady surface where it will not be subjected to being accidentally dropped.
  - Assuring that the device is kept from children
- For heart failure, the patient is instructed to measure the Zo at the same time every morning, before breakfast and after the first void.
- The patient is instructed to record his/her Zo reading on the *Daily Zo Log* and to report readings outside of prescribed levels to Home Health VNA. S/he is instructed to call his/her clinician for readings less than 20 or greater than 30, or if the Zo reading has decreased by two ohms within 24 hours. Clinicians document these readings and any follow-up measures taken in the patient's medical record.
- The clinician notifies the physician of any two (2) ohm decrease in Zo reading within a 24 hour period.
- Clinicians review the patient's Zo log during each visit and document readings in the vital signs section of the medical record.

## **ZOE™ Device Set-up and Operation**

- 1. AC Power Connection:**
  - a. Insert the AC power pack connector end into the AC power pack insertion site on the ZOE™ monitor.
  - b. Secure the two-pronged AC power cord into a standard electrical outlet.
- 2. ZOE™ Monitor Hook-up:**
  - a. Skin prep
    - i. Before placing electrodes onto the skin, make sure that the skin is clean and dry.

- ii. All hair should be removed from the site where the electrode(s) will be placed to assure a good connection to the skin and a good Zo measurement.
- b. Connecting the ZOETM cable:
  - i. Insert the connector end of the ZOETM cable into the cable connection site on the back of the ZOETM monitor base.
  - ii. Snap the ZOETM electrodes to the ZOETM cable with the arrows pointing to the center of the chest.
- c. Attaching the electrodes to the chest:
  - i. Attach hydrogel electrode 1 just above the top of the breastbone with the arrow tip pointing down.
  - ii. Attach hydrogel electrode 2 just below the bottom of the breastbone with the arrow tip pointing up.
  - iii. Check all cables to make sure they are plugged in securely.



**Caution! Only approved ZOETM electrodes should be used with the ZOETM Fluid Status Monitor. Zo readings obtained from unapproved electrodes may not be accurate!**

**3. ZOETM Measurement:**

- a. Press the “START” button on the front of the ZOETM Fluid Status Monitor.
- b. Wait about 30 seconds for the Zo value to appear in the ZOETM display window, instructing the patient not to move.
- c. Document the ZO value

**Caution! Do not press the “START” button while the ZOETM Fluid Status Monitor is measuring the Zo value. Doing this only slows down the measurement process.**

- d. The Zo value will automatically turn off within one minute after being displayed.
- e. ZoeTM electrodes are for single use only.

**Cleaning:**

- The outside surface of the ZOE™ monitor and the ZOE™ cable may be cleaned and disinfected with a pad soaked in (95%) alcohol.
- Never use abrasive tools to clean the device
- During cleaning make sure the ZOE™ is not exposed to temperatures above 113°F.

**Maintenance:**

- All service and repair on the ZOE™ unit must be conducted by a certified center. There are no user serviceable parts contained in the unit.
- The unit requires 4 AA batteries. Only alkaline batteries are acceptable.
- Batteries must be changed when the “low battery” indicator is lit.
- The ZOE must be calibrated and certified annually by a certified center.

**Troubleshooting:**

<b>Problem</b>	<b>Possible Cause</b>	<b>Solutions</b>
<b>ZOE Displays Implausible Results</b>	<ul style="list-style-type: none"><li>▪ <b>Low battery</b></li><li>▪ <b>Inadequate connection with electrodes</b></li><li>▪ <b>Cable has become disconnected</b></li></ul>	<ul style="list-style-type: none"><li>▪ <b>Allow batteries to cool for 5 minutes and retry the Zo measurement</b></li><li>▪ <b>Replace all batteries</b></li><li>▪ <b>Press electrodes onto clean skin</b></li><li>▪ <b>Check all cable connections</b></li></ul>
<b>No Results are Displayed on the ZOE Window</b>	<ul style="list-style-type: none"><li>▪ <b>Cable has become disconnected</b></li><li>▪ <b>Inadequate power</b></li></ul>	<ul style="list-style-type: none"><li>▪ <b>Check all cable connections</b></li><li>▪ <b>Replace batteries</b></li><li>▪ <b>Plug in the AC Power Pack</b></li></ul>

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