

# HD02 Training



During HD02 inservice training, a Transonic representative will instruct the hemodialysis staff on how to perform the measurements and how to record and track data for the clinic. With the instructor, the staff will proceed through the protocol for a Hemodialysis Adequacy Study, an Access Patency Study and a Cardiac Output Study. Upon completion of the training, each trainee will receive Flow-QC certification. The following overview pertains to the Transonic HD02 system. Please contact your Transonic representative if you have a different Transonic hemodialysis monitoring system.

## A. Set-up

Plug-in and turn on the laptop computer. Once MS Windows opens on the computer, turn on the Flow-QC Monitor.

Place a small amount of Vaseline in the groove of the arterial (red label) sensor and position it approximately 5-10 cm, (2-4 inches) from the needle connection on the arterial blood line (A)(Fig. 16). The arrow on the sensor must point in the direction of flow. Similarly, place a small amount of Vaseline in the groove of the venous (blue label) sensor and position it approximately 5-10 cm, (2-4 inches) from the needle connection on the venous blood line (B) (Fig. 16). The arrow on the sensor must point in the direction of flow.

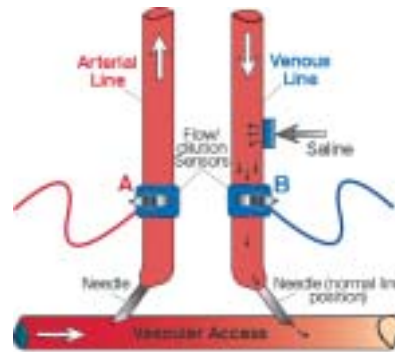
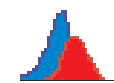


Fig. 16: Placement of sensors on blood lines.

## B. Operating the HD02 Software Program

For detail descriptions of all HD02 operations, please refer to the *Operator's Manual*. Flow-QC operations are guided by the computer software program. To start the program, double click on the HD02 Dialysis System icon on the computer screen and then click on the Monitor icon.



System icon



Monitor icon

### SELECT OR ADD PATIENT

To select a patient, scroll and highlight a patient name or use the up and down arrow keys (the first letter of patient's last name will act as a short cut). To add a patient, click, ADD NEW PATIENT or press F1 and you will be prompted for new patient information. When the appropriate patient name is highlighted, click START PATIENT Session or press the Space Bar.

### SELECT TUBING

Click on the TUBING ICON in the upper right-hand corner of the screen or press F2. Click the down arrow and scroll down or use the first letter of the tubing manufacturer as a shortcut to select the tubing being used for the patient.



Tubing icon

## C. Delivered Blood Flow (Qb) (F2)

To verify Delivered Blood Flow (Qb), compare the dialysis machine pump setting with the measured arterial delivered blood flow displayed on the front of the Transonic HD02 Hemodialysis Monitor. The discrepancy should be within 10% of the dialysis machine's setting.

## D. Access Recirculation (AF)(F9)



AR icon

Click on the RECIRCULATION ICON in the lower right corner of the screen or press **F9**. Click on Start Protocol or press Space Bar. You will be prompted to add optional parameters such as blood pressure, height and weight. These parameters are not required, but are important for documentation in the database and printed reports. When the traffic light turns green, open pressure limits on the dialysis machine and release saline from the saline bag for 5 to 6 seconds *or* inject 10 ml of saline into or before the venous bubble trap. Once the timer has reached zero, a recirculation dilution curve and a calculated % recirculation will be displayed on the screen. If recirculation measurement is > 0%, stop the pump, reverse the blood lines and repeat the recirculation test. If recirculation is then 0%, the blood lines were inadvertently reversed.

## E. Vascular Access Flow (AF)(F10)



AF icon

Click on the ACCESS FLOW ICON in the lower right corner of the screen or press **F10**. Click on START PROTOCOL or press Space Bar. Stop the blood pump, reverse the blood lines and set the dialysis pump between 250-300 ml/min. When the traffic light changes to green, open the pressure limits on the dialysis machine and release saline from the saline bag for 5 to 6 seconds. (If a pump flow of 200 ml/min can not be maintained, access flow can still be measured by injecting 10 ml of saline before or into the venous bubble trap.) Once the timer has reached zero, an access flow dilution curve and a calculated access flow will be displayed on the screen.

## Transonic Flow-QC

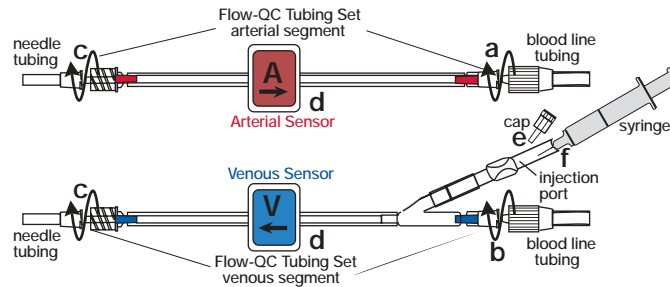


Fig. 17: Sensors placement on blood tubing set lines. Note: • Do not place sensors on needle tubing lines or blood lines. • The arrows on sensors must point in the direction of flow.

## F. Cardiac Output



CO icon

### Important Information:

- Cardiac output can be measured in patients with access flow > 300 ml/min & no access recirculation.
- Cardiac Output cannot be measured in patients with a central venous catheter.
- Cardiac Output can only be measured using Flow-QC tubing sets.
- Insert Flow-QC Tubing during priming of Dialysis circuit.

### PREPARE SALINE

Fill three B-D 30cc syringes with isotonic saline and place in a Transonic Syringe Warmer. (Refer to the syringe warmer instructions for use.)

### PLACE FLOW-QC SENSORS AND TUBING

Remove tubing segments from package. Remove caps from Flow-QC tubing segments. Attach the red banded end of arterial segment to male end of the arterial blood line (a) as shown in Figure 17. Likewise, attach blue-banded branch of Y end to male luer-lok connector on the venous blood line (b). Prime Flow-QC tubing removing all air bubbles from tubing. Attach the arterial & venous Flow-QC set line to the needle tubing (c) in normal line position. Place sensors in middle of Flow-QC lines (d).

### MEASURE CO

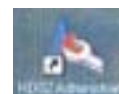
Select Transonic Flow-QC tubing from the tubing list (F2). Start CO measurement by clicking on the gold heart icon in the lower right corner of the

screen, or press **F11**. You'll be prompted to enter required parameters (height, weight, heart rate, blood pressure) in order for the system to calculate all the necessary values. Remove air bubbles from the syringe. Unscrew injection port cap (e) and connect the syringe to injection port (f). When the traffic light on computer screen turns green, inject 30 ml of warmed saline within 5-7 seconds.

*Note: if you cannot stop the pump or turn off the venous alarms, temporarily clamp off the line leading to the pressure transducer. A CO dilution curve, calculated CO, CI and CBV values will be displayed. To display Height, Weight, Heart Rate, Blood Pressure, Peripheral Resistance, Central Blood Volume Index, Systemic Cardiac Index and Stroke Volume, click on the small #2 icon next to the traffic light.*

*Note: If a REPEAT MEASUREMENT message is displayed, wait for the traffic light to turn green, and repeat injection. If the first two measurements are within 15% of each other, it is not necessary to make a third measurement.*

## G. Administrator Program



To access the administrative portion of the software, click on the administrator icon after launching the HD02 software. The Administrator Program allows the user to modify, organize, review and print data. Each house icon displayed on the main administrator software screen illustrates a separate clinic database. The trash can holds deleted patient information, which can be retrieved if needed. Click on the magnifying glass next to each house icon to display the patients in that clinic. Click to select the desired patient. You can also use the arrow keys to scroll up and down the patient list.

### DATA REVIEW OPERATIONS

#### PATIENT TRENDING

Graphs of all the tabulated information including Access Flow History, Cardiac Output History and Patient Information are located in the upper right hand corner of the software screen. The icon on the corresponding tab identifies the graphs.

### G. Administrator Program cont.

#### **STATISTICS**

Statistics work on all three levels of the database tree: clinic, group, and patient. For example, to view the statistics on a particular clinic, highlight the clinic in the tree in the upper left-hand section of the screen, and click the icon with the “i” and blue circle. More specific statistics are available for each type of measurement and intervention by selecting the tabs at the top of the window for Interventions, Access Flow, Recirculation, and Cardiac Output. Highlighting an individual patient, group, or clinic will result in statistics on the highlighted entity. There is also an option to print the statistics table.

#### **IDENTIFY PATIENTS**

To search the database for patients with certain criteria, click the icon with the white star and yellow circle. This feature can be used to identify patients on the alert list, identify patients by non-zero Recirculation, by Access Flow < 600mL/min, by Access Flow < 2000 ml/min, by Interventions or by Cardiac Index  $\geq 2.0$ . It is also possible to search for patients not measured in the last  $x$  days and for patients not measured since a particular date.

#### **SHOW MEASUREMENT GRAPHS**

To review individual graphs, select the desired measurement in the table, then click on the blue and red dilution curve icon or double-click the measurement line in the table. The graph will be displayed in a new pop-up window. There are also options to print the graph or copy the graph to disk.

#### **REPORTS**

To generate a report for a patient, select the patient in the database. Click on the “R” with the purple circle icon. This will display a window with the type of reports possible to generate and print. Click on the short 1-page report, the full 5-page report or the custom report and click the generate and print icon. This will send the patient information to the default printer. To print more than one patient at a time, press the control key (CTRL) while you select patients with the mouse. All charts for patients highlighted will print out at one time.

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## G. Administrator Program cont.

Reports can also be generated for a particular clinic by selecting the clinic in the tree and clicking the “R” with the purple circle icon.

## H. Database Operations

The Database Operations menu is located in the upper left-hand corner of the Administrator screen. The menu contains functions to view data from other clinics, files and databases. The functions from the dropdown menu include:

### VIEW ALERT LIST

This function displays a list of all patients falling below the set access flow thresholds that are entered into each patient’s profile. The default thresholds are set for the K/DOQI Guideline recommendations for vascular access surveillance. There is an option to print the Alert List, print a short report of all alert list patients or to change the fistulagram referral state field. Clicking the **Change Fistulagram Referral State** button places a check mark next to a selected patient’s name on the Alert List to identify that the patient has been referred for a fistulagram. Click **OK** to exit the alert list.

### VIEW LOGS

This function displays daily log files as a summary of daily activity. Log files appear arranged by year. To access the log files, click on the magnifying glass next to the appropriate year, and click again on the magnifying glass next to the appropriate month. Highlight the desired day and the log file will appear on the right side of the software screen. You can print the log file by pressing the print button at the bottom of the screen or copy the log file to a floppy disk. Click **OK** to exit the log file.

### VIEW PATIENTS BY NEPHROLOGIST

This function organizes all patients by their Nephrologist. Each green person icon indicates a separate Nephrologist. If a patient’s Nephrologist is not entered, the patient will be listed under “Unknown”.

## H. Database Operations cont.

### **VIEW PATIENTS BY VASCULAR SURGEON**

This function organizes all patients by their Vascular Surgeon. Each green person icon indicates a separate Vascular Surgeon. If a patient's Vascular Surgeon is not entered, the patient will be listed under "Unknown".

### **VIEW PATIENTS BY INTERVENTIONAL RADIOLOGIST**

This function organizes all patients by their Interventional Radiologist. Each green person icon indicates a separate Interventional Radiologist. If a patient's Interventional Radiologist is not entered, the patient will be listed under "Unknown".

### **VIEW PATIENTS BY GROUP**

This function organizes patients by their group. A group is defined by the end-user and is typed in the Group field under **Patient Information**. If the Group is not specified, the patients will be grouped under "Unknown".

### **VIEW PATIENT TRACE PLUS DATABASE**

This function views CSV files (from HD01 monitors) that may be saved on the HD02 computer or other disk drives. A browsing window is used to find, select and view a file.

### **IMPORT PATIENT TRACE PLUS DATABASE**

This function imports CSV files from existing HD01 database files into a HD02 database file. A browsing window is used to find, select and import a file. Type a name for a new clinic database or select an existing one from the pull down list. When importing CSV files, it is best to import into a new clinic. Importing a CSV file into an existing clinic may result in lost data. **Please see Appendices A and B of the Operator's Manual for complete instructions on importing data.**

### **EXPORT AS PATIENT TRACE PLUS DATABASE**

This function exports the HD02 database information to a PatientTrace<sup>Plus</sup> CSV file, which can be transferred to an HD01 monitor or other applications

## H. Database Operations cont.

such as Microsoft Excel. To export all the data from the current database to a CSV file, select the **Database Operations** menu, and scroll down to **Export PatientTrace Plus Database**. Select a current CSV file to append your data to, or to create a new CSV file. A CSV file name will automatically be created or type over the name in the box.

### BACKUP/RESTORE DATABASE

To backup data, select the **Backup/Restore** function from the Database Operations menu. Press the **New Backup** button. **It is suggested that you backup your data before using the other functions available on this screen.**

To restore your data to a previous date, select a date from the list of backups or press the **Retrieve Backup from Floppy** button and follow the on-screen instructions. After a backup is selected, you can use one of the four buttons on the right to preview, copy, restore, or delete the selection.

## I. Clinic Operations

### VIEW ALERT LIST

This is the same function as the VIEW ALERT LIST under database operations, except for a particular clinic.

### RENAME CLINIC

This function allows you to rename a clinic in the database. To rename a clinic, select the desired clinic and select the **Clinic Operations** menu, and select **RENAME CLINIC**. Type the new name in the blank space provided and press the **OK** button. Clinics may be merged by renaming a clinic to an existing one.

### EXPORT AS PATIENT TRACE PLUS DATABASE

This is the same function as EXPORT AS PATIENT TRACE PLUS DATABASE under Database Operations, except for a particular clinic.

## J. Patient Operations

The **PATIENT OPERATIONS** MENU provides functions for modifying and deleting patients and adding notes to patients. The functions from the dropdown menu include **ADD PATIENT**; **EDIT PATIENT**; **MERGE PATIENT**; **DELETE PATIENT**; **RESTORE PATIENT & NEW INTERVENTION**.

### **NEW INTERVENTION**

The HD02 Administrator program can catalog vascular access interventions. To add an intervention to a patient's record, highlight the desired patient name on clinic list on the upper left corner of the screen. Select the **PATIENT OPERATIONS** menu and choose **NEW INTERVENTION**. This will give you a template to enter intervention type, access location, date and text notes.

## K. Measurement Operations

The **MEASUREMENT OPERATIONS** menu provides functions for modifying and deleting measurements, and adding notes to measurements. The functions from the dropdown menu include **EDIT INTERVENTION**; **ADD NOTE**; **EDIT NOTE**; **DELETE MEASUREMENT**; **RESTORE MEASUREMENT**; **MOVE MEASUREMENT**.