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DHD-3 Digital Hand Dynamometer G-STAR™ Grip Strength Testing and Research Software Installation and User Manual



Grip **SAEHAN**®

Table of Contents

Section 1	Introduction	4
Section 2	Software Installation	5
Section 3	Menu and Toolbar Commands	13
Section 4	Backing Up and Restoring the Database	16
Section 5	Setting Data Default Values	18
Section 6	Patient Registration	20
Section 7	Grip Strength Testing	23
Section 8	Endurance Testing	28
Section 9	Listing Test Results	34
Section 10	Research Using the G-STAR™ Database	36
Section 11	Importing Stand-Alone Tests from the DHD-3	38
Appendix A	Score Table	44

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Section 1: Introduction

Although the DHD-3 Digital Hand Dynamometer includes many features when used as stand-alone device, the Grip Strength Testing and Research Software (G-STAR™) extends the DHD-3 capabilities. G-STAR is an easy to use, yet powerful software tool which automates grip strength and endurance testing in both clinical and research environments. All patient information and their test results are stored in an Access® database which includes normative score tables for comparison based on age and gender. Maximum grip strength and grip endurance tests are graphically displayed during testing and can be saved in the database with their associated patient information. In addition, tests saved in the DHD-3 itself when used as a stand-alone device, can be imported into the database when re-connected to the PC using G-STAR.

Default values for search functions, sorting sequence, testing mode, unit of measure and other parameters can be set based on preference and common usage, but can be changed for individual tests as required. Voice guidance provides assistance during program operation and helps guide the patient during testing. G-STAR also includes utilities for backing up and restoring the database as well as exporting individual test results to text (.txt) files. The G-STAR database can also be directly accessed to export data into Excel® for customized analysis and reporting.

For research applications, selected groups of patients and strength test results from a single database can be combined for analysis and reporting, or separate databases can be used for different groups and research studies. The Average grip strength, Standard Deviation, and Coefficient of Variation are calculated after each test. The research functions display combined test results for individual patients and groups of patients based on a list of search options. All test result screens can be printed for inclusion with patient records and images of test result screens can be easily captured for inclusion in research documentation.

Section 2: Installation

Step 1: Download the current version of the G-STAR™ Software

The current version of G-STAR software can be obtained from www.sachanmedical.com. Under the “Customer Support” tab, click on “Dataroom” and select **DHD-3 G-STAR [SH1003]**. Click “Save” to download the compressed installation program **DHD-3 G-STAR (v1.x).zip**.

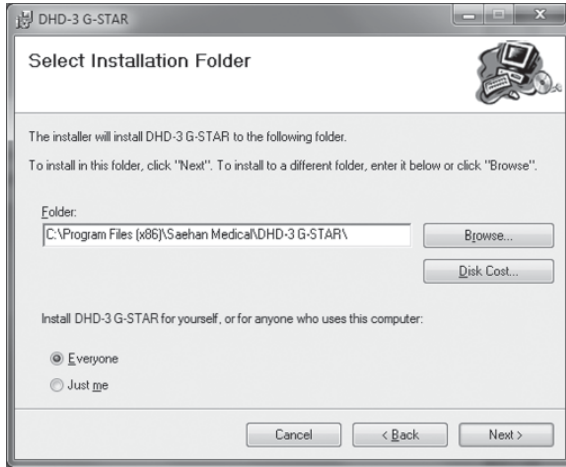
Step 2: Run the DHD-3 Setup Wizard

Double-click the downloaded **DHD-3 G-STAR (v1.x).zip** file to decompress the file and then double-click on the  **DHD-3 G-STAR** file to start the installation program. Click **N**ext to continue.

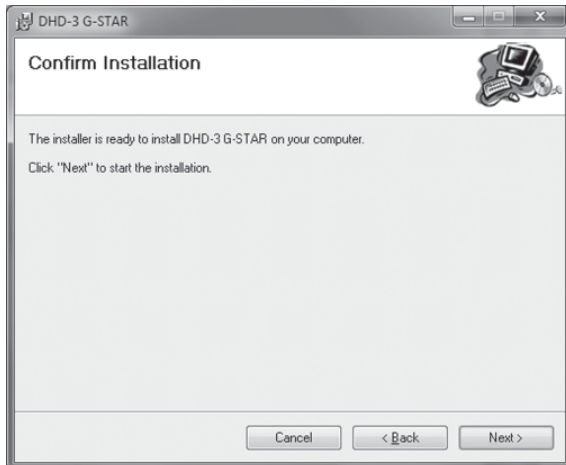


G-STAR™ - Installation

Select the folder for installation of the G-STAR software. This folder is also where the database containing patient, testing, and research information is stored. Click **N**ext to continue.

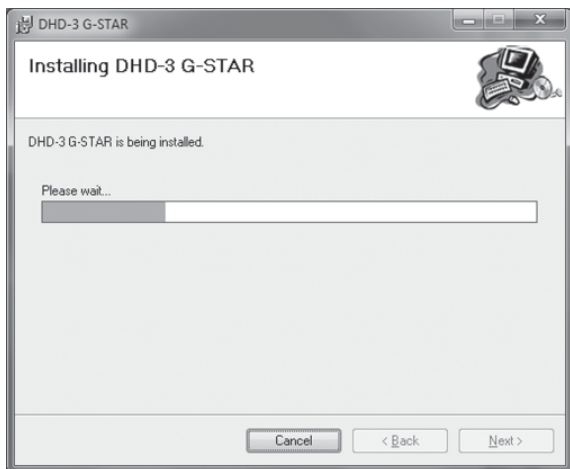


Click **N**ext to continue with the installation of the software and database.

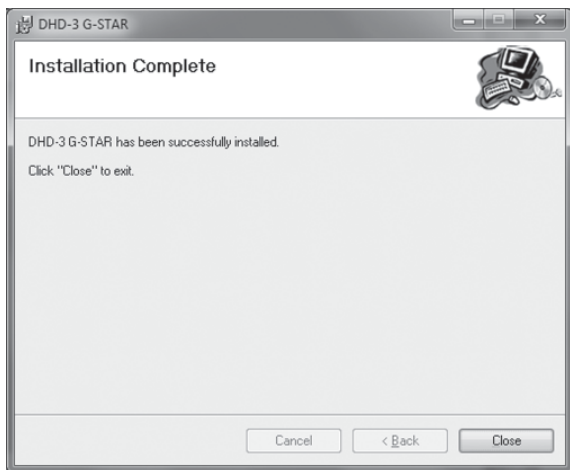


G-STAR™ - Installation

The progress bar indicates files are being installed.



Click **Close** to complete the G-STAR software installation.




Step 3: Installation of the USB Virtual Com Port Driver

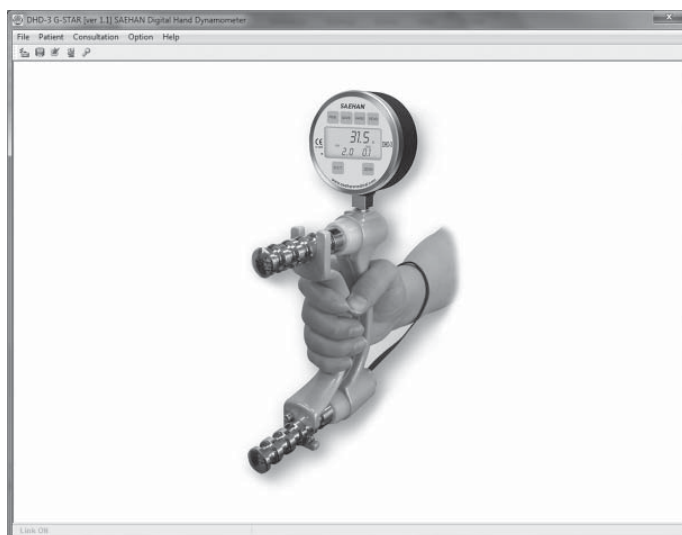
The USB Virtual COM port driver can be obtained from www.saeahanmedical.com. Under the “Customer Support” tab, click on “Dataroom” and select **DHD-3 G-STAR [SH1003]**. Click “Save” to download the **VCPDriver v1.3.1.zip**.

Run **VCP_V1.3.1_Setup (VCP_V1.3.1_Setup_x64)**. The setup program will install the USB Virtual COM Port software and provide instructions when to connect the DHD-3 using the USB cable.

Step 4: Linking the DHD-3 with the G-STAR software

Connect the DHD-3 to the PC using the USB cable and press the **PWR** button to turn on the device. Click on the desktop icon  to run the G-STAR software which should automatically establish a link with the DHD-3.

Link ON is displayed in the lower left corner of the screen when the link is successful.



If **Link Off** is displayed and the error message “**No Device**” appears, then follow the instructions in Step 5 and Step 6 for identifying and setting the USB COM Port number in G-STAR.

Step 5: Identify the COM Port number assigned by Windows

The COM port number will be uniquely assigned to your PC by Windows. To learn which Virtual USB COM Port number was assigned by Windows during installation, follow the instructions below for your version of Windows, then proceed to Step 6.

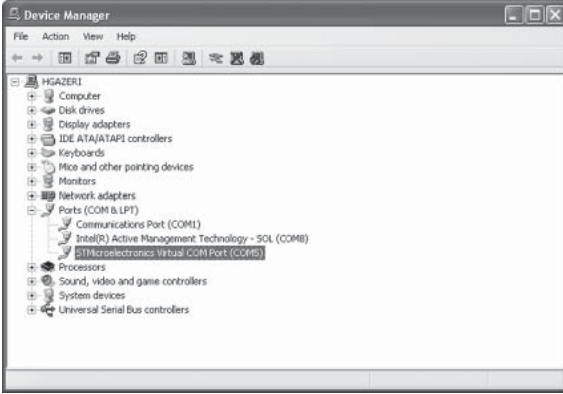
For Windows XP

Connect the DHD-3 using the USB cable and press the **PWR** button to turn on the device. Go to the **Start Menu** and select **Control Panel** → **System**, click on the **Hardware** tab and then click **Device Manager**.



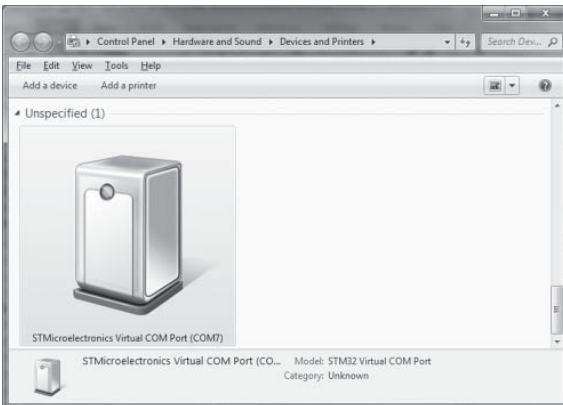
G-STAR™ - Installation

Expand the list of **Ports (COM & LPT)** by clicking on the ‘+’ sign. The **(COM#)** next to “STMicroelectronics Virtual COM Port” is the COM Port number Windows XP has assigned for the DHD-3. Make note of the COM#, and then close the Device Manager and Control Panel windows.



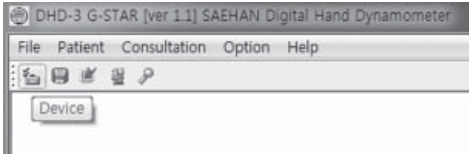
For Windows Vista and Windows 7

Connect the DHD-3 using the USB cable and press the **PWR** button to turn on the device. Go to the **Start Menu** → **Devices and Printers**. The **(COM#)** next to “STMicroelectronics Virtual COM Port is the COM Port number Windows Vista or Windows 7 has assigned for the DHD-3. Make note of the COM#, and then close the Devices and Printers window.



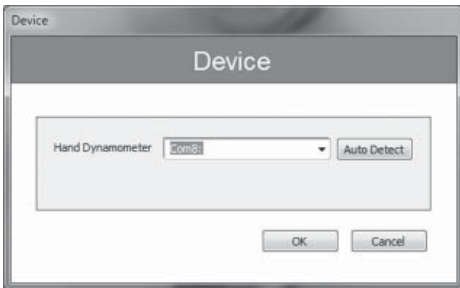
Step 6: Setting the COM Port Number in G-STAR

With the DHD-3 connected and powered on, start G-STAR. Click the **Device** icon on the toolbar.

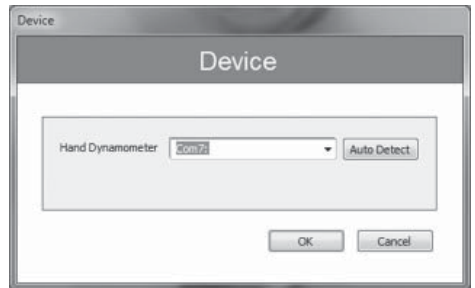


Select the COM Port number identified in Step 5 to link successfully with the DHD-3. Click **OK** to continue.

Windows XP Example



Windows Vista/Windows 7 Example

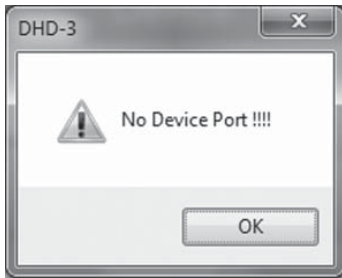


The following message will appear when the DHD-3 Digital Hand Dynamometer is successfully linked with the G-STAR software. Click **OK** to begin using the program.



G-STAR™ - Installation

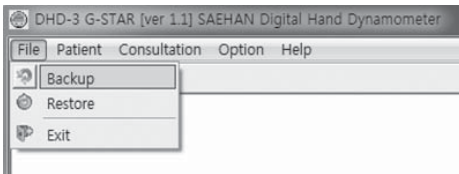
To permanently save the selected COM Port number in G-STAR, disconnect the USB cable and select the correct COM Port number again as described above. Then click **OK**. Since the DHD-3 is disconnected, the following message will be displayed, but the COM port number will be saved to the G-STAR configuration file (TMK-EDM) and become the default COM Port number. Each time the DHD-3 is connected, it will link automatically for G-STAR testing and will display stand-alone test results stored in DHD-3 memory for importing into the G-STAR database.



Section 3: Menu and Toolbar Commands

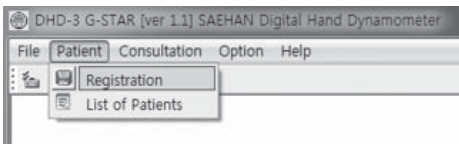
All features of the G-STAR software can be accessed by selecting one of the five menu items across the top of the screen and then selecting from the list of pull-down functions. The most common functions are also included on the Toolbar enabling quick access to the desired feature.

File Menu



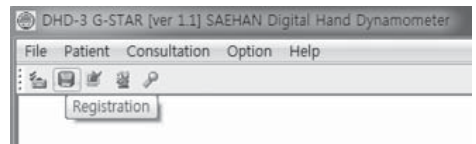
- **Backup** Creates a backup copy of the database using the date as the filename
- **Restore** Replaces current database with a previous backup copy of the database
- **Exit** Exits the program

Patient Menu

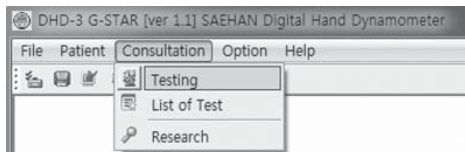


- **Registration** Add, edit, delete, and search patient file information
- **List of Patients** List selected patient information and their test dates

Toolbar Icon

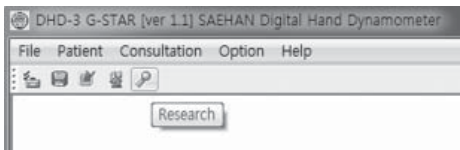
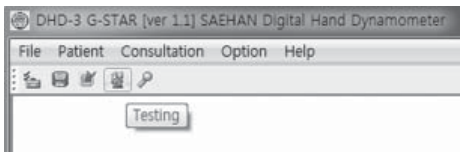


Consultation Menu



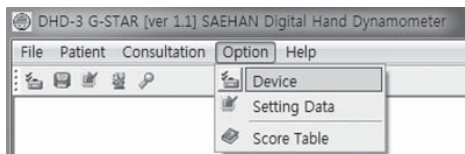
- **Testing**
- **List of Test**
- **Research**

Toolbar Icons



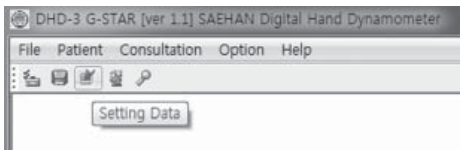
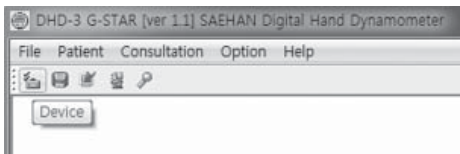
Maximum Strength Testing and Endurance Testing
Displays individual test results for selected patients
Calculates and displays results for selected groups of patients and tests

Option Menu



- **Device**
- **Setting Data**
- **Score Table**

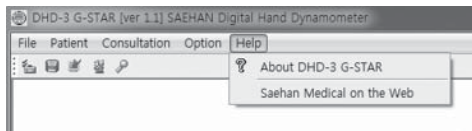
Toolbar Icons



Selects COM Port for linking with DHD-3 Digital Hand Dynamometer
Set default values for searching, testing and displaying results
Normative grip strength data for comparison during strength testing *

* For more information, see Appendix A: Score Table

Help Menu



- **About DHD-3 G-STAR**
- **Saehan Medical on the Web**

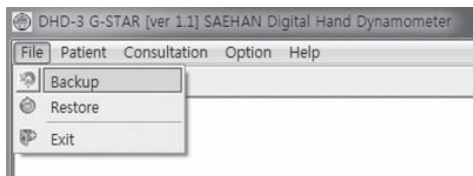
Displays G-STAR software version
Link to www.saeahanmedical.com

Section 4: Backing Up and Restoring the Database

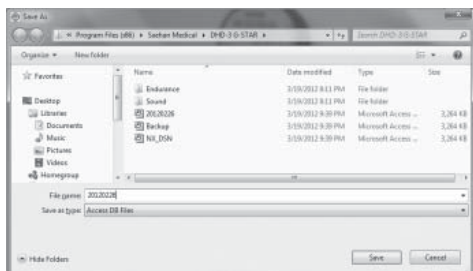
Before using G-STAR, it is important to understand where the database and supporting files are located, and to verify full access to the database. The database, program files, and database backup files are located in the program folder selected during installation (*Program Files\Saehan Medical\DHD-3 G-STAR*).

Creating a Backup of the Current Database

To save a copy of the current database, select **File → Backup**

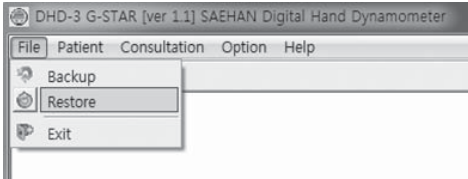


Choose a unique file name to save a backup copy of the current database (NX_DSN). G-STAR can save a copy as “Backup” automatically when exiting G-STAR (see **Section 5 : Setting Data Default Values**).

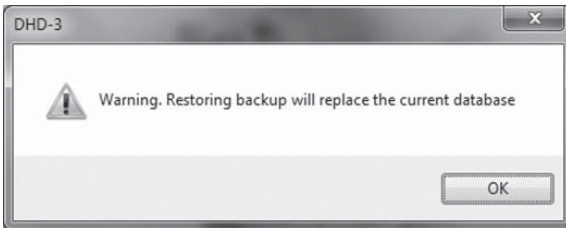


Restoring a Backup Copy of the Database

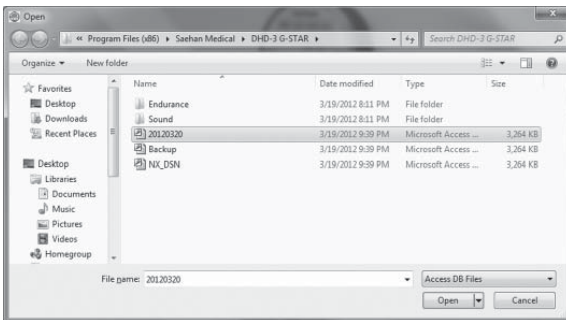
To restore a previous copy of the database, select **File** → **Restore**



Click **OK** on the warning message.



Select the file name of a previous backup to restore as the current database or select the file name “Backup” to restore the most recent copy of the database if **Backup Copy on Exit** was set to “Yes” in the Setting Data screen. G-STAR uses “NX_DSN” as the current database. Click **Open** to restore the selected backup copy of the database and begin using as the current database.



Note: If you select **Cancel**, G-STAR has already disabled access to the current database in preparation to replace it with a backup copy. Simply exit and restart G-STAR to re-enable access to the current database again.

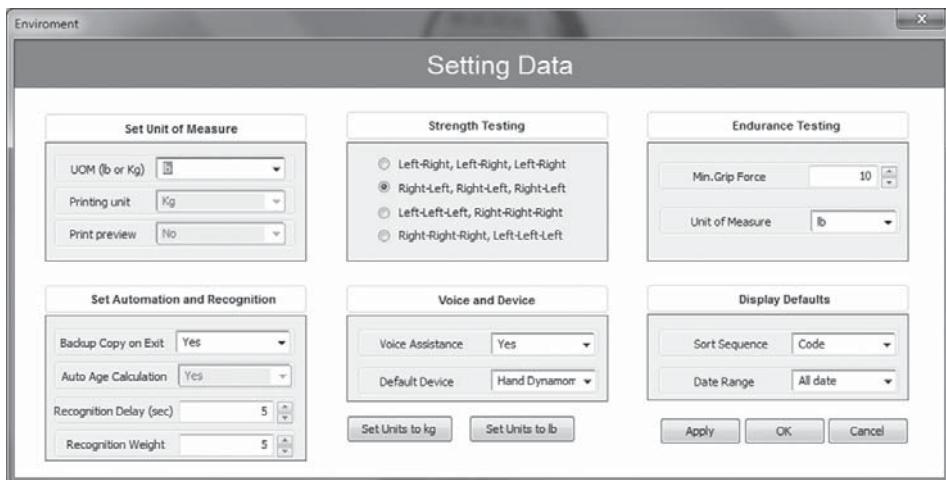
Section 5: Setting Data Default Values

Setting Data is used to modify and save default values for common usage during testing and when displaying patient information and test results. Some of the values can be set during testing to different settings as needed, but are not saved as default values for future testing.

To modify and save default values, select **Option** → **Setting Data** or click the **Setting Data** toolbar icon.



Select and change the default values as desired, then click **Apply** and **OK**.



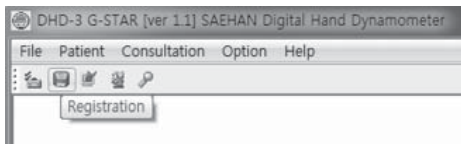
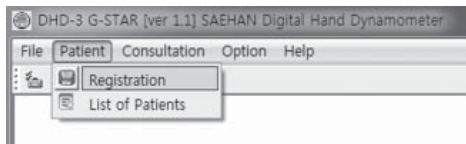
- **UOM (lb or Kg)** Selects the preferred unit of measure for testing and display
- **Printing unit** Cannot be changed - printing is based on UOM
- **Print preview** Disabled – prints screen image directly to default printer
- **Backup Copy on Exit (Saves to Copies)** Saves the current database to “Backup” when exiting G-STAR
- **Auto Age Calculation** Disabled – all calculations use age at time of registration
- **Recognition Delay** Delay in seconds for prompts to switch hands during testing
- **Recognition Weight** Minimum grip force required to start recording strength testing
- **Strength Testing** Sets hand switching sequence for strength testing (3 per hand)
- **Voice Assistance** Sets voice assistance and testing prompts on or off
- **Default Device** Only DHD-3 Digital Hand Dynamometer is available
- **Set Units to kg/lb** Sets UOM and Unit of Measure for both test modes
- **Min. Grip Force** Sets the minimum grip force required for endurance testing
- **Unit of Measure** Selects either lb. or kg for endurance testing
- **Sort Sequence** Selects sort sequence for displaying lists of patients and tests
- **Default Range** Selects default registration date range in search functions

Section 6: Patient Registration

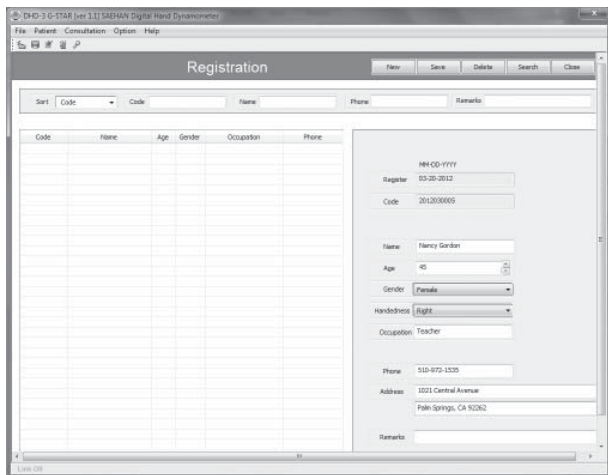
Patient Registration is used to add, edit, and delete patient information. New patients are automatically assigned a unique Code based on the year and month when first registered combined with a two-digit number incremented from 00-99. Existing patient information can be retrieved by their Code or by searching on a combination of their name, phone number, and remarks.

To access the Patient Registration screen, select **Patient** → **Registration**, or click the **Registration** toolbar icon.

Adding New Patient Information

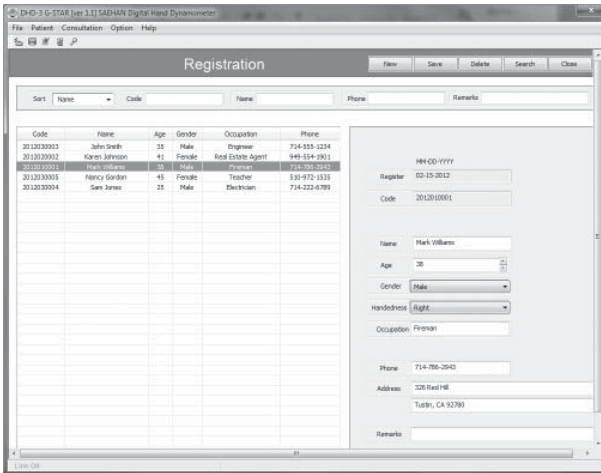


Select **New** to automatically generate the next unique patient Code and then enter the patient's information on the right side of the screen. Name, Age, Gender, and Handedness are required for comparison of strength test results with normative data in the Score Table and to group patients when using G-STAR for research studies. Click **Save** to add the new patient information to the database.



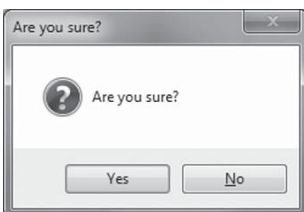
Editing Patient Information

To modify an existing patient's information, enter their Code and click the **Search** button. You can also enter any combination of their Name, Phone number, and Remarks and then click **Search** to display matching results. To sort the matched results in a different sort sequence, select the **Sort** option and click on **Search** again. Select a specific patient from the list on the left side of the screen and edit the highlighted patient's information on the right side of the screen. Click **Save** to update changes to the database or **Close** to close the Registration screen without updating changes to the database.



Deleting Patient Information

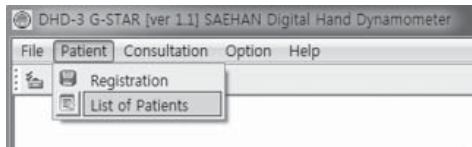
To delete patient information and all their saved test results from the database, select the specific patient as described above so their information is displayed on the right side of the screen. Click Delete to delete the patient information from the database and then click **Yes** to confirm the deletion.



Listing Patient Information

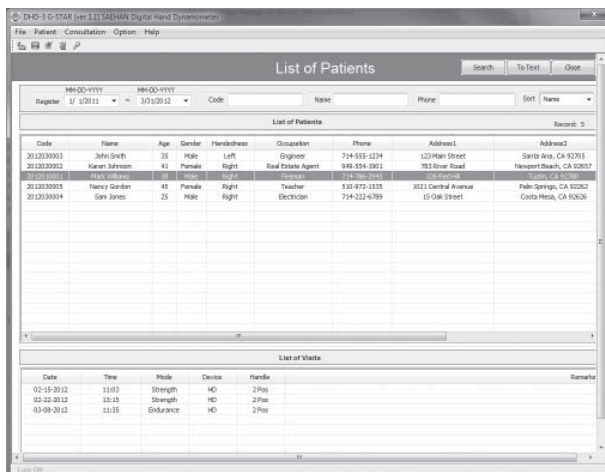
List of Patients is used to search for patients and view a summary of their saved test results. The list of patients is based on the search criteria and can be saved in a text file for printing and exporting to other programs.

To access the List of Patients screen, select **Patient** → **List of Patients**.



To display an existing patient's information and view a list of their previous test visits, enter their Code and click **Search**. You can also enter any combination of date range when registered, Name, and Phone number and then click **Search** to display matching results. To display the matching results in a different sort sequence, select the **Sort** option and click **Search** again. Highlight a specific patient from the list to view their previous test dates in the lower part of the screen.

To begin testing a specific patient in the list, highlight their patient information without closing the List of Patients screen, and then select **Consultation** → **Testing** or click the **Testing** toolbar icon.

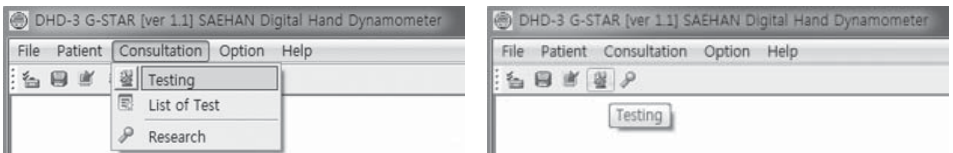


Section 7: Grip Strength Testing

The G-STAR software automates the Rapid Exchange Testing process. The process consists of selecting a registered patient for testing, administering the strength test, and reviewing the test results. Strength testing is performed in six steps by testing each hand three times hands in the sequence established in the Setting Data screen. This method provides an accurate measurement of maximum grip strength for each hand.

Upon completion of the strength test, the Average grip force, Standard Deviation (SD), and Coefficient of Variation (CV) are calculated and displayed for each hand. Strength test results are also compared with normative data in the Score Table based on the patient's gender, age and dominant hand. Saved test results can be used to measure patient progress during rehabilitation and can be included in specific groups for research studies.

To begin the maximum grip strength testing process, select **Consultation** → **Testing** or click on the **Testing** toolbar icon.

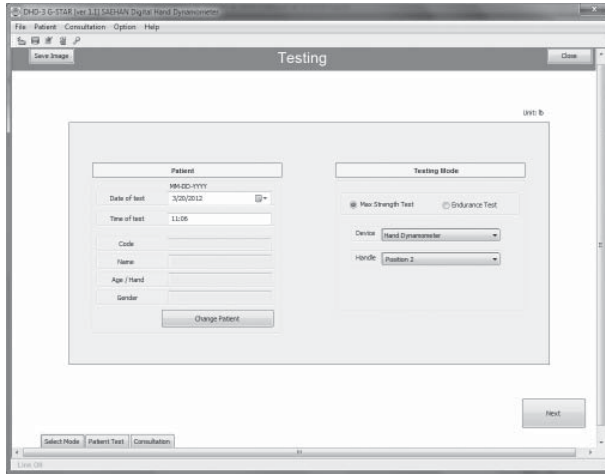


Selecting the Patient

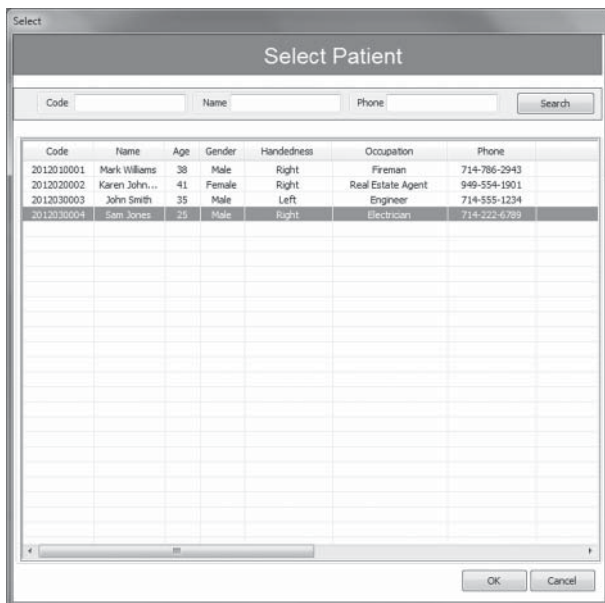
The **Select Mode** screen is used to select a registered patient and test mode setting. The patient information will appear if previously highlighted on the **List of Patients** screen as previously described.

Select **Change Patient** to view and select from a list of registered patients.

G-STAR™ - Grip Strength Testing



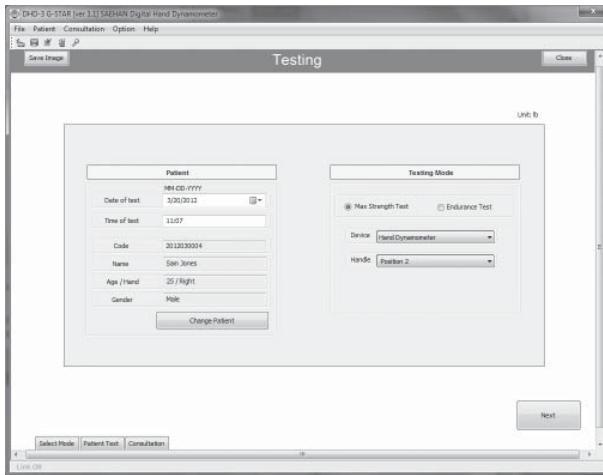
The patient can be selected by entering their Code or a combination of Name and Phone number; then click **Search** to display matching results. Highlight the patient to be tested, and click **OK**.



G-STAR™ - Grip Strength Testing

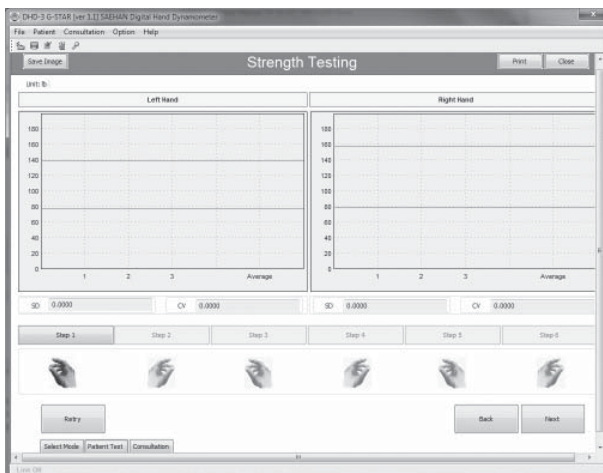
Select **Max Strength Test** and then click **Next** to continue to the **Patient Test** screen.

Note: The normative data in the Score Table is based on Handle Position 2.



Strength Testing

Instruct the patient to exert maximum grip force during the three tests of each hand using the sequence graphically displayed from left to right as Step 1 through Step 6, and the prompting by the optional voice assistance. The horizontal red lines indicate the normative range for the patient based on gender, age, and dominant hand.



G-STAR™ - Grip Strength Testing

During testing, the grip force is displayed for each hand. The following commands are available:

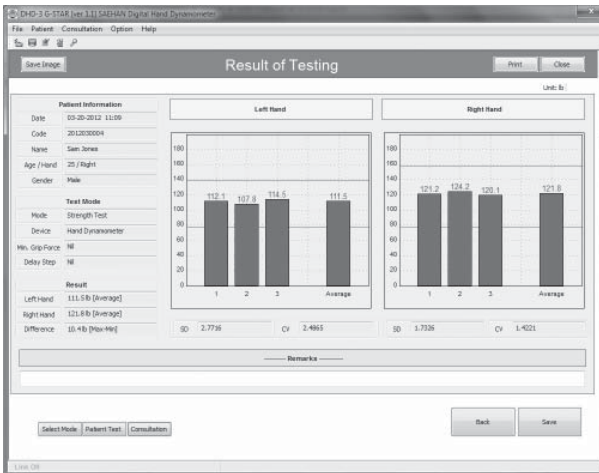
- **Retry** Restart the test for this patient
- **Save Image** Capture and save an image of the screen
- **Print** Print an image of the screen to the default printer
- **Close** Close the screen without saving
- **Back** Return to the **Select Mode** screen
- **Next** Continue to the **Consultation** screen



Reviewing Results

The Consultation screen displays detail information about the patient, test mode settings, and grip strength test results including an area to enter remarks about the test. The Average grip force, Standard Deviation (SD), and Coefficient of Variation (CV) are calculated and displayed for each hand as well as the difference between the averages of each hand. The following commands are available:

- **Save Image** Capture and save an image of the screen
- **Print** Print an image of the screen to the default printer
- **Close** Close the screen without saving
- **Back** Return to the **Patient Test** screen
- **Save** Saves test information in the database and close the screen

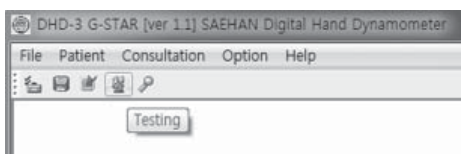
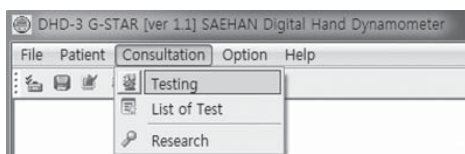


Section 8: Endurance Testing

Endurance testing is a method to measure both the amount of grip force a patient can maintain and the length of time the patient can exert grip force above the minimum setting. Grip strength and endurance can be improved by systematically increasing the minimum grip force and endurance time during therapy. G-STAR is an ideal tool to for use in therapy and to accurately measure patient progress and response to therapeutic treatment.

Initially, measure the patient's maximum grip strength using Grip Strength Testing to determine the minimum grip force to be maintained during Endurance Testing. For example, start with 50% of the average maximum grip strength as the minimum grip force setting and to measure the amount of time the patient can continuously maintain their grip above the minimum grip force setting. As the patient's endurance time increases, the minimum grip force setting can be gradually raised.

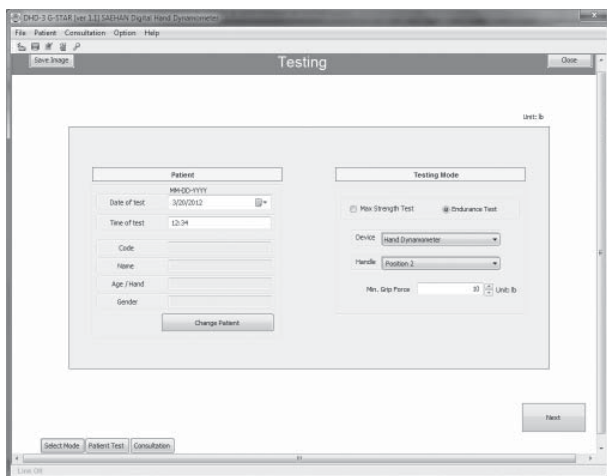
To begin the endurance testing process, select **Consultation** → **Testing** or click on the **Testing** toolbar icon.



Selecting the Patient

The **Select Mode** screen is used to select the patient and the test mode. The patient information will appear if previously highlighted on the **List of Patient** screen as previously described.

Select **Change Patient** to view and select from a list of registered patients.



G-STAR™ - Endurance Testing

The patient can be selected by entering their Code or a combination of Name and Phone number, then click **Search** to display matching results. Highlight the patient to be tested, and click **OK**.

Select Patient

Code: _____ Name: _____ Phone: _____ Search

Code	Name	Age	Gender	Handedness	Occupation	Phone
2012010001	Mark Wilkens	38	Male	Right	Fireman	714-786-2943
2012020002	Karen John...	41	Female	Right	Real Estate Agent	949-554-1501
2012030003	Sam Jones	25	Male	Right	Electrician	714-222-6789
2012030004	Sam Jones	25	Male	Right	Electrician	714-222-6789
2012030005	Nancy Gordon	45	Female	Right	Teacher	510-972-1535

OK Cancel

Select **Endurance Test** and set the **Min. Grip Force** to be maintained during testing. Click **Next** to continue to the Patient Test screen.

Testing

Save Image Close

Unit: B

Patient

MM-DD-YYYY
Date of test: 3/20/2012

Time of test: 12:34

Code: 2012030003

Name: John Smith

Age / Hand: 33 (Left)

Gender: Male

Change Patient

Testing Mode

Max Strength Test Endurance Test

Device: Hand Dynamometer

Handle: Position 2

Min. Grip Force: 50 Unit: B

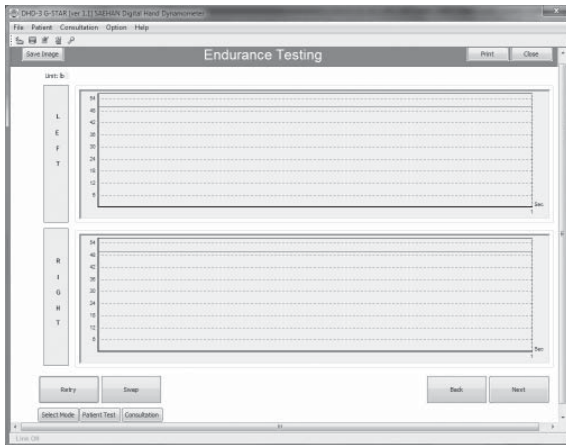
Next

Select Mode | Patient Test | Consultation

Endurance Testing

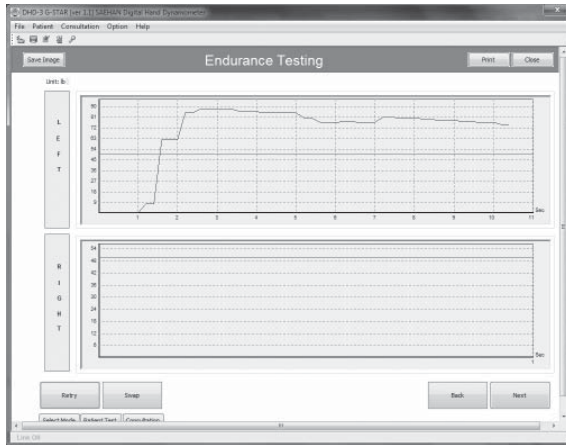
Instruct the patient to begin with the DHD-3 in their left hand and to maintain grip force above the horizontal red line for as long as possible or until instructed to stop. During testing, the grip force will be graphically displayed as a blue line once grip force is applied and a preset 200ms delay. Although the vertical timing marks will continuously scroll across the bottom from right to left, endurance hold time is calculated only during the time minimum grip force is maintained. During testing, both the grip force and timing marks scale to fit the display.

The horizontal red line indicates 50 lbs. is set as the minimum grip force setting.



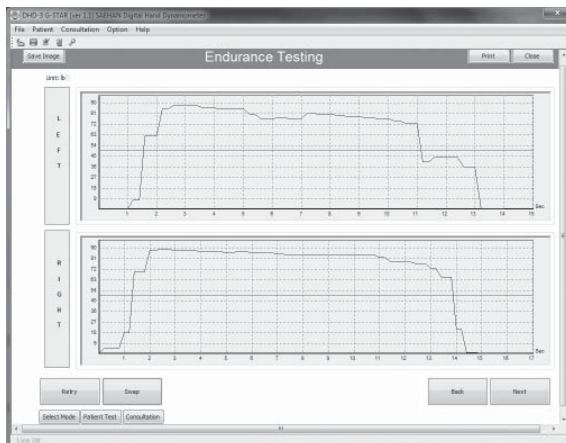
G-STAR™ - Endurance Testing

Endurance testing always begins with the left hand and continues until grip force falls below the red Minimum Grip Force line. Select **Swap** and follow the voice assistance prompt to begin testing right hand endurance.



The following commands are available:

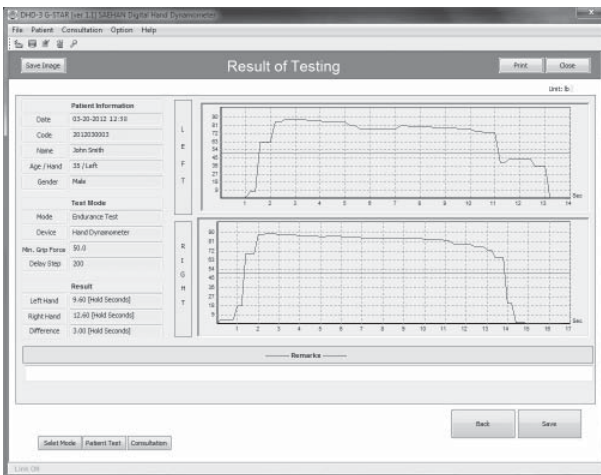
- **Retry** Restart the endurance test for the selected hand
- **Swap** Start endurance test for the other hand
- **Save Image** Capture and save an image of the screen
- **Print** Print an image of the screen to the default printer
- **Close** Close the screen without saving
- **Back** Return to the **Select Mode** screen
- **Next** Continue to the **Consultation** screen



Reviewing Results

The **Consultation** screen displays detail information about the patient, test mode settings, and endurance test results including an area to enter remarks about the test. The duration of time grip force was maintained above the minimum grip force is calculated and displayed for each hand as well as the difference in duration of time between hands. The following commands are available:

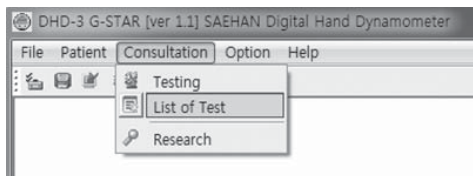
- **Back** Return to the **Patient Test** screen
- **Save Image** Capture and save an image of the screen
- **Print** Print an image of the screen to the default printer
- **Close** Close the screen without saving
- **Save** Save test information in the database and close the screen



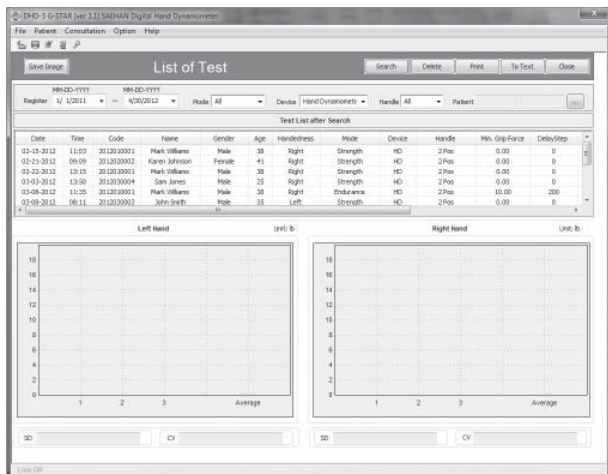
Section 9: Listing Test Results

List of Test is used to display a list of saved tests based on the search criteria. By highlighting a specific test from the list, individual test results are graphically displayed. The list of tests including test results can be saved in a text file for printing and exporting to other programs if desired.

To access the List of Test screen, select **Consultation** → **List of Test**.



To display the list of tests, enter a combination of the date range when patients were registered and the testing Mode, then click **Search** to display matching results. You can also display tests based on patient Code, Name, and Phone number using the patient search function. To display the matching results in a different sort sequence, click on the column headers.

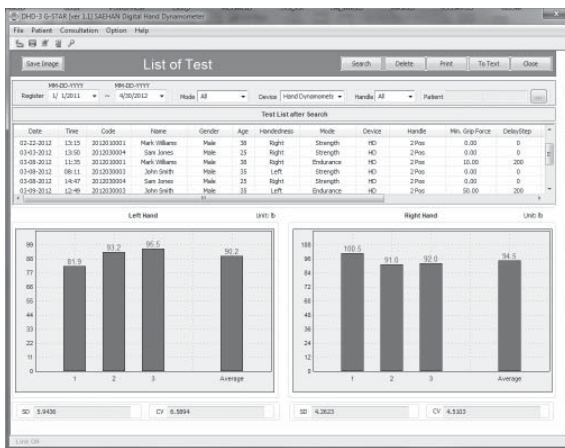


G-STAR™ - Listing Test Results

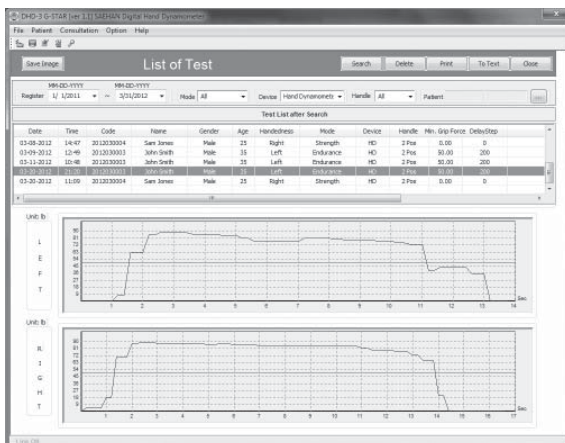
The following commands are available:

- **Save Image** Capture and save an image of the screen
- **Delete** Delete the highlighted test result
- **Print** Print an image of the screen to the default printer
- **To Text** Save the highlighted test result to a text file (.txt)
- **Close** Close the screen without saving

To graphically display a Strength Test from the list of tests, select a specific test by highlighting the row of information.



To graphically display an Endurance Test from the list of tests, select a specific test by highlighting the row of information.



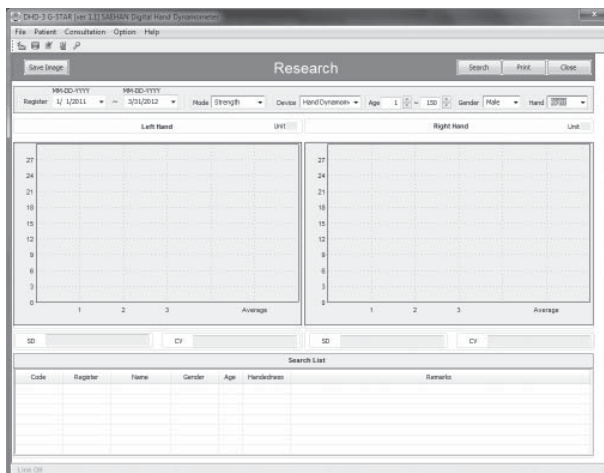
Section 10: Research Using the G-STAR Database

Research is used to display a list of patients with one or more strength tests saved in the database based on search criteria for a specific group of patients. The combined results of the group are graphically displayed in addition to the combined Average grip strength, Standard Deviation, and Coefficient of Variation calculations for the group. By highlighting a specific patient within the group list, only the combined results of all strength tests for the patient are displayed.

To access the Research screen, select **Consultation** → **Research** or click on the **Research** toolbar icon.



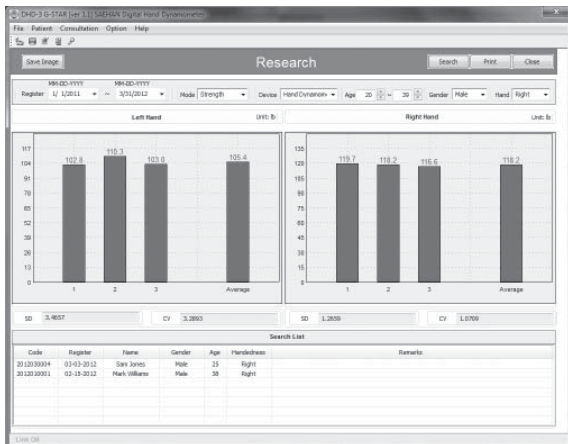
To display a list of patients included in a research group, enter any combination of the date range when patients were registered, Age range, Gender, and dominant Hand, then click **Search** to display the list of patients matching the search criteria. To display the list of patients in a different sort sequence, click on the column headers.



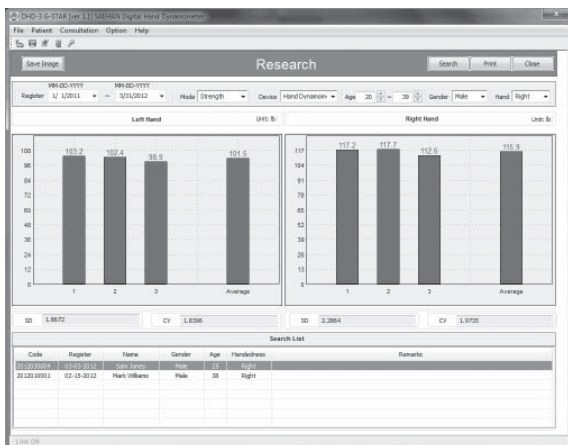
The following commands are available:

- **Save Image** Capture and save an image of the screen
- **Print** Print an image of the screen to the default printer
- **Close** Close the screen without saving

The combined results of the group are displayed graphically as well as the combined Average grip strength, Standard Deviation, and Coefficient of Variation calculations for the group.



By highlighting a specific patient within the group, the combined results of all strength tests for the patient are displayed.

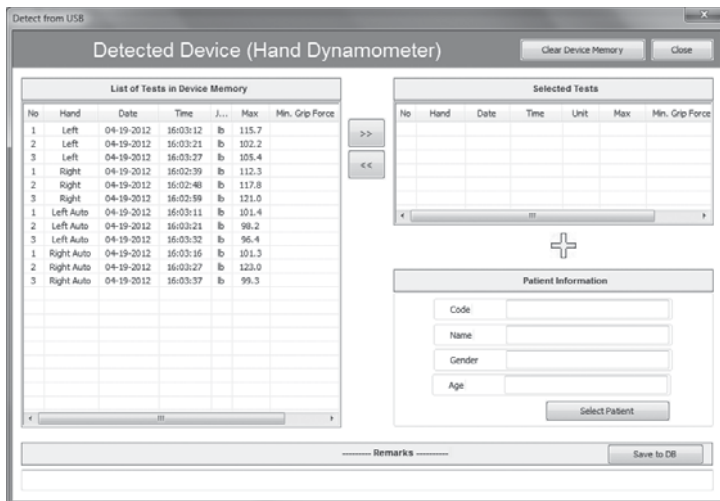


Section 11: Importing Stand-Alone Tests from the DHD-3

Stand-alone tests from a patient performed when the DHD-3 is not connected can be imported into the G-STAR database the next time the DHD-3 is reconnected. Up to three strength test results for each hand saved in the DHD-3 memory for an individual patient in Testing Mode and/or Auto Mode can be selected and imported for a patient previously registered in G-STAR. Stand-alone tests should be imported on the same day since G-Start saves the tests based on the import date. Refer to the DHD-3 Digital Hand Dynamometer User Manual for more information on using the DHD-3 as a stand-alone device.

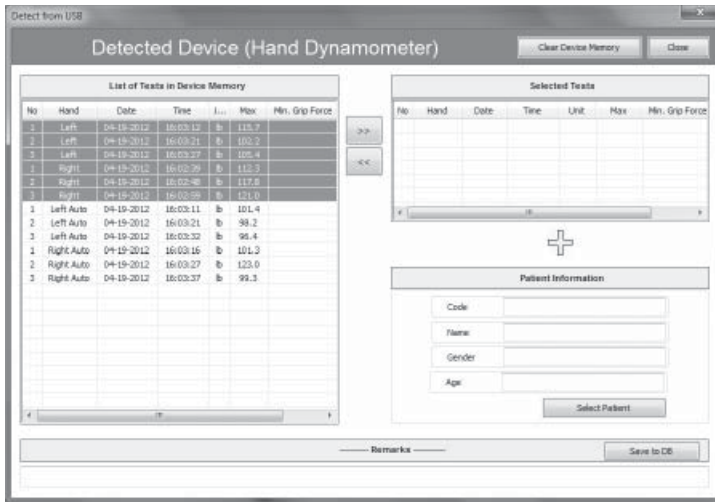
Step 1: Displaying Stand-alone Test Results Saved in the DHD-3

As soon as the DHD-3 is reconnected to G-STAR, the list of saved test results in the DHD-3 memory is displayed. In this example, both Testing and Auto Mode stand-alone tests have been saved in the DHD-3 memory.

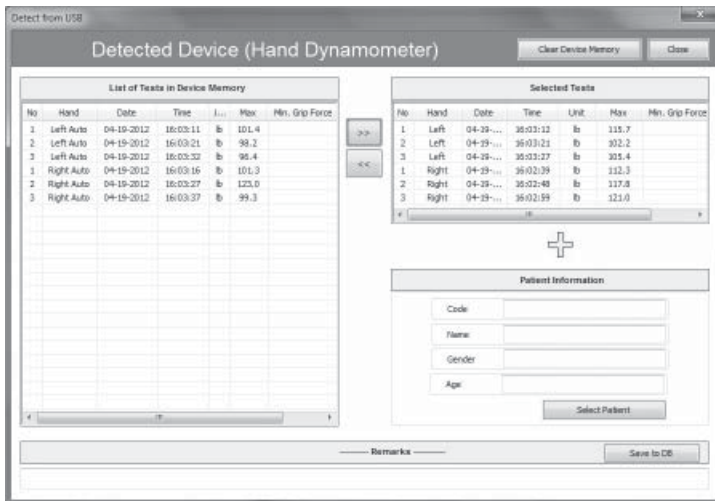


G-STAR™ - Importing Stand-Alone Tests from the DHD-3

Test results can be chosen individually or in groups by using the **SHIFT** key or the **CTRL** key when choosing the tests to be imported.



Click  to select the highlighted tests for import into G-STAR.



Step 2: Selecting the Patient

Click **Select Patient**. The patient can be selected by entering their Code or a combination of Name and Phone number; then click **Search** to display matching results. Highlight the patient to be associated with the stand-alone Selected Tests and then click **OK**.

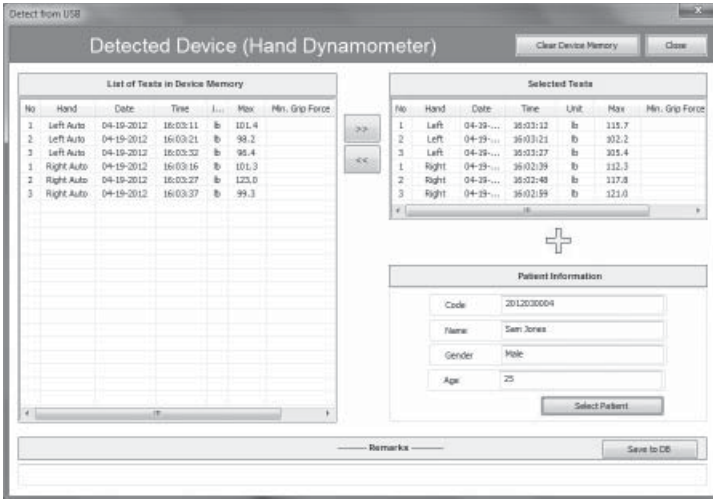
The screenshot shows a dialog box titled "Select Patient" with a search interface and a data table. The search fields include "Code", "Name", and "Phone", with a "Search" button to the right. The table below contains the following data:

Code	Name	Age	Gender	Handedness	Occupation	Phone
2012010001	Mark Williams	38	Male	Right	Fireman	714-786-2943
2012020002	Karen John...	41	Female	Right	Real Estate Agent	949-554-1901
2012030003	John Smith	35	Male	Left	Engineer	714-555-1234
2012030004	Sam Jones	25	Male	Right	Electrician	714-222-6789
2012030005	Nancy Gordon	45	Female	Right	Teacher	510-972-1535

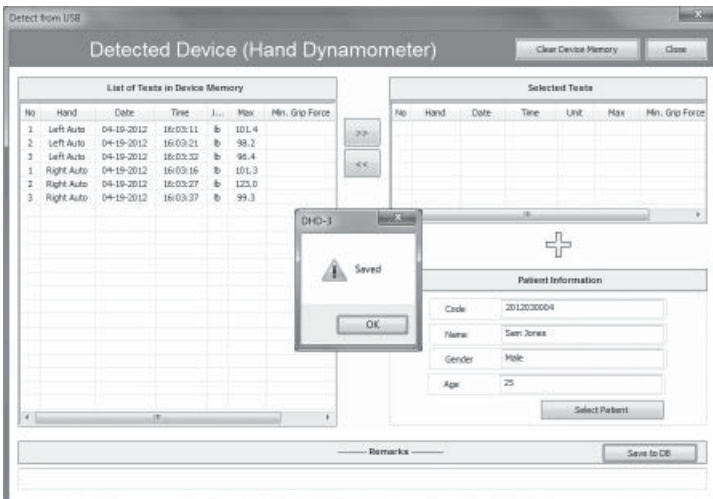
At the bottom of the dialog box are "OK" and "Cancel" buttons.

Step 3: Saving the Imported Tests

Remarks may be entered for the selected tests prior to saving. Click on **Save to DB** to save the imported tests in the G-STAR database.

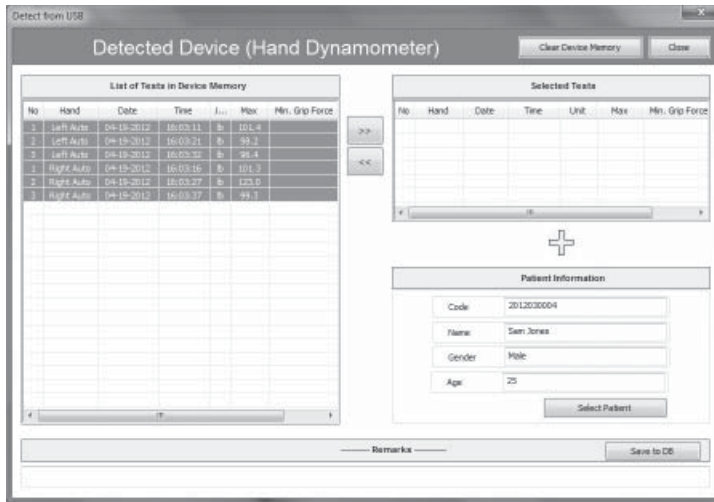


As the tests are saved to the database, the list of **Selected Tests** will be cleared and the **Saved** message will be displayed. Click **OK** to continue.

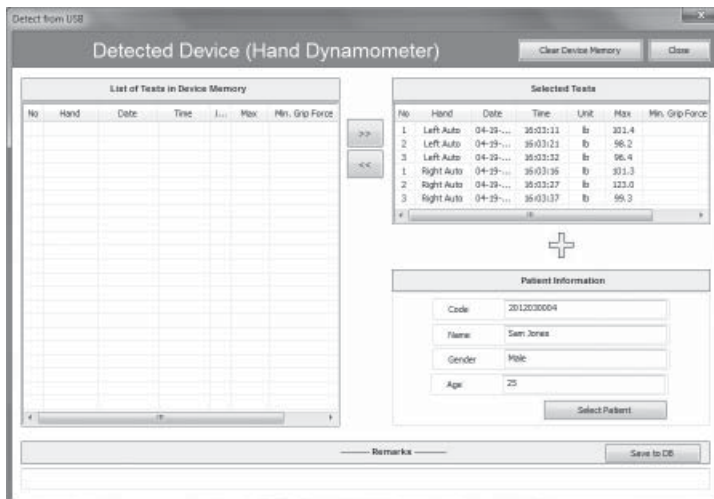


G-STAR™ - Importing Stand-Alone Tests from the DHD-3

If Auto Mode tests are also stored in DHD-3 memory, repeat the process to select the Auto Mode Tests for the same patient.

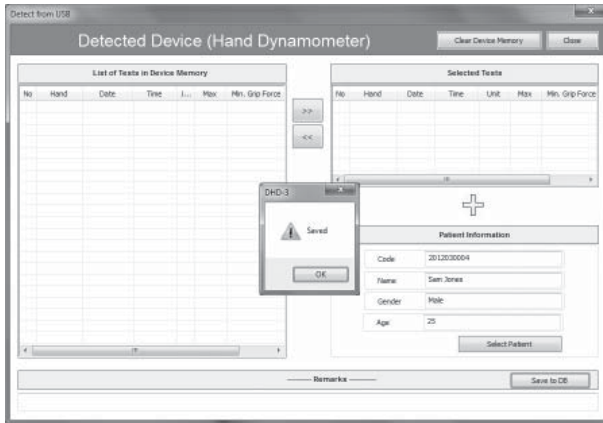


Remarks may be entered for the selected tests prior to saving. Click on **Save to DB** to save the imported tests in the G-STAR database.



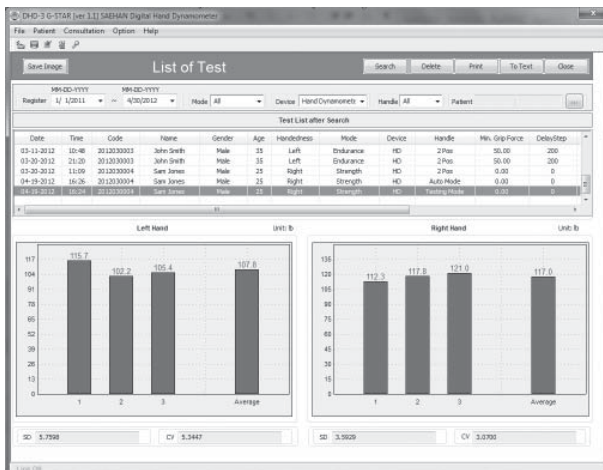
G-STAR™ - Importing Stand-Alone Tests from the DHD-3

As the tests are saved to the database, the list of **Selected Tests** will be cleared and the **Saved** message will be displayed. Click **OK** to continue.



After saving the tests, the stored tests in the DHD-3 memory can be cleared by clicking **Clear Device Memory** or by disconnecting the DHD-3 and holding the **Zero** button on the device.

The imported tests can now be displayed in List of Test.



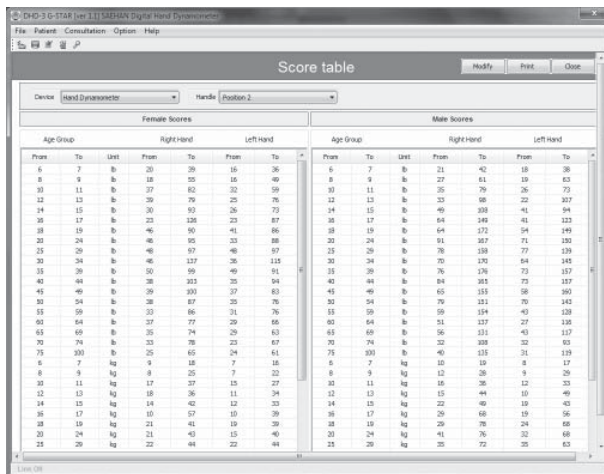
Appendix A: Score Table

The Score Table is used by G-STAR to display the range of normative grip strength force for each hand based on age and gender for the patient during Strength Testing. The lower and upper ranges of normative data are displayed as horizontal red lines.

The Score Table data is based on the following research studies using handle position #2:

Mathiowetz V, Federman S, Wiemer D. “Grip and Pinch Strength: Norms for 6 to 19 Year Olds”, *The American Journal of Occupational Therapy* 1986; 40:705-11.

Mathiowetz V, Kashman N, Volland G, Weber K, Dowe M, Rogers S. “Grip and Pinch Strength: Normative Data for Adults”, *Archives of Physical Medicine Rehabilitation* Vol. 66, February 1985.



The following commands are available:

- **Modify** Enable modification of the Score Table
- **Save** Save modifications of the Score Table to the database
- **Print** Print an image of the screen to the default printer
- **Close** Close the screen without saving

DHD-3 Digital Hand Dynamometer
G-STAR™ Grip Strength Testing and Research
Software
Installation and User Manual

[SH-UM-001, Rev.1, 2012, 11, 30]

Manufacturer	EC Representative
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