

Computer Software Overview

The Computer software utilized for testing and training via the MedX equipment includes clinical and analytical tools that will enhance your procedures and minimize time spent on the keyboard.

I. BASIC HARDWARE COMPONENTS

- A. **System unit** - the actual computer.
- B. **Keyboard** -- an input device which allows the user to communicate with the computer.
- C. **Video** -- monitor or screen.
- D. **Video AMP** -- amplifier which allows more than one monitor to be connected to the computer.
- E. **Surge Protector** -- provides multiple power outlets for the computer and it's peripheral devices (i.e. monitor, video AMP, printer, etc.). It protects these devices from power surges.

II. ACCESSORIES

Miscellaneous functions that assist in using the program.

- A. **About Program** -- indicates the program version you are currently running.
- B. **Tickler** -- allows you to enter messages on selected days - used as a reminder.
- C. **Clock** -- is displayed in the upper right hand corner of the screen. It can be turned on or off.
- D. **Calendar (~A)** -- a perpetual desk calendar that allows you to quickly determine the interval between two tests, schedule the next visit, etc.
- E. **Calculator (~B)** -- will add, subtract, multiply and divide.
- F. **MedX Logo** -- "busy body" eliminator. Prevents people from viewing an unattended screen.
- G. **Clear Screen** -- clears the screen.

II. PATIENTS

Menu allows you to add, edit or delete a patient's file.

- A. **Patient Data Screen** - holds stored information for each individual patient. Patient's first and last name must be entered in order to create a me. Patient ID number can be sequentially assigned or denoted by social security number.
 1. Patient information can be edited by selecting CHANGE in the patient window.
 2. Patient files can be deleted by selecting DELETE in the patient window.
 3. Messages can be left in a patient's me and can be prioritized in the MESSAGE window. Function keys hold special meaning in the message window.
 4. The dates of first test, next test and last test will be located in the patient screen.

- B. **Patient's flags.** This is a facility-defined field that may be used to associate up to 10 pre-defined conditions with this patient. MedX asks you to use the following codes to assist in current research.

L	Litigation
W	Workers' Comp
N	No change
R	Reduced Pain
P	Pain free

IV. CALIBRATE

A method to check the accuracy of the machine's measurement devices (ie. Pot Zero, SG Zero).

Calibration Update for the lumbar and cervical extension machines is performed at the idle positions of 18° and 90°, respectively. It is recommended that Calibration Update is conducted at least one time per day (usually in the morning).

- A. POT (Potentiometer) ZERO - digital representation of the idle position. This number usually falls between 0 and 4096.
- B. SG (strain gauge) ZERO - digital representation of the force applied to the strain gauge during machine calibration. Any force applied to the movement arm during calibration will greatly effect this measurement. This number usually falls between 0 and 4096.
- C. Scenarios for calibration problems:
 - 1. if machine is calibrated with the angle selector set at a position greater than the idle position, the “angle prompt” on the computer monitor will display an angle less than that in which the angle selector is engaged.
 - 2. if machine is calibrated with the angle selector set at a position less than the idle position, the “angle pr0ll1pt” on the computer monitor will display an angle greater than that in which the angle selector is engaged.
 - 3. if counterweight is locked during calibration, the SG count will fall out of range due to the force being applied to the strain gauge.

V. TEST

Opens up to a menu of machines which are currently supported by MedX software.

- A. **Locate Previous Test** - allows the computer to use already existing values for patient machine settings.
- B. **Find Range Of Motion** - allows the patient’s range-of-motion to be logged into the patient file.
- C. **Counterbalance** - procedures are conducted for each patient in order to compensate for gravitational forces on the measurement.
 - 1. TDC (top dead center) - the body’s “balanced, neutral” position.
 - 2. Zero Torso Mass - done at the patient’s greatest angle of relaxed “forcefree” extension.
- D. **Patient Positioning** - allows for the input and modification of patient positioning data (Le. seat height, femur restraint position, seat pad, etc.). After the first test has been completed, the program will automatically update this information on subsequent sessions. Alterations to this data should be performed immediately prior to testing or exercise for changes to be saved.
- E. **Test Options** - allow modification to the way a static test is performed.
 - 1. 1. Shadow - during a static test, shadow displays the forces produced at each angle of any previous isometric test. This feature can be used to motivate your patient.
 - 2. 2. Random - alters patient’s visual feedback by randomly changing the scale on the y-axis (force) between each test angle. It also only displays one test angle at a time.
 - 3. 3. Manual- standardizes testing angles manually.
 - 4. 4. Energy - allows user to measure stored energy torque production of the muscle group relative to individual testing angles.
 - 5. 5. Preset - standardizes testing angles automatically.
- F. **Static Test** - can be performed after the patient’s range-of-motion has been determined and the counterbalance procedures are complete.
 - 1. Remarks allow you to permanently label the test (ex. Pre FRT).
 - 2. Set test angle point
 - 3. Measure torque a. SE - stored energy b. m - total functional torque
- G. **Dynamic Test** - is performed with the resistance loaded on the weight stack. It is important to enter into the program the same amount of resistance that has been loaded on the weight stack. If the weight selected on the weight stack is less than that entered into the computer, the timer may malfunction.

- H. **Next Patient** - allows you to retrieve a patient's me from the test window.
- I. **Change Tester ID** - allows you to modify the tester ID code for each test.
- J. **Explanations** - allow you to change the default explanation that is printed following a test. These explanations can be modified.
- K. **Pain** - Offers the tester the opportunity to survey the patient's pain severity and interference immediately prior to conducting a static test.

VI. GRAPH

Allows the user to view a patient's test results and monitor progress. This permits you to support or supplement insurance reports, or present data to other clinicians.

- A. **Analysis** - will load the graph analysis system and open a patient's graph file. The patient to be selected first will be the last patient selected from the patient menu. If you wish to work with another patient's file, type in the ID number or the patient's last name.
 1. Selection boxes will appear on the screen.
 - a. all tests taken for this patient will appear in the bottom box.
 - b. select test of interest by denoting #1 through #5 and tests selected will move to the upper box.
 1. F1 - Print
 2. F2 - Normal- displays the curve which fits the cam ratio (ideal) of the machine.
 3. F3 - Area - shades the area under the subject's strength curve.
 4. F4 - Overlay - allows an overlay of up to 5 isometric tests on one graph.
 5. F5 - Multi - allows the simultaneous display of up to 4 static tests, each on their own separate graph.
 6. F6 - Scale - allows the user to change the scale on the x-axis (angle) and y-axis (force).
 7. F7- Reg - produces a line of best fit for one static test.
 8. F8 - ESC - Escape or Exit
- B. **Inroads** - allow the calculation of percent change between two different isometric tests. Such tests may include:
 - a. 2 short measurements of fresh strength (acceptable range of variability).
 - b. 2 long term measurements of fresh strength (average improvement due to rehabilitation program)
 - c. pre/post test of a FRT (fatigue response to dynamic exercise). You will select the tests of interest by highlighting with the red cursor bar and pressing enter. The order in which you enter the tests is very important. Selecting 2 static tests and "escaping" from selecting' corresponding dynamic test will display relative differences by angle on a +100 to -100 scale. Selecting 2 static tests with corresponding dynamic test will display relative differences by angle on a +50 to -50 scale.
- C. **Norms** - Accesses the integrated, age-matched, gender-based, machine specific normative data and overlays a static test belonging to a patient with average norms plus/minus one standard deviation. Also calculates and displays- percent difference between the patient's test and the norm.
- D. **Dynamic** - Displays the weight stack values for up to 12 dynamic exercises over time in one graph and overlays them with a shaded area (normative values) that identifies treatment goals.
- E. **ROM** (range-of-motion) - allows you to track a patient's increase in ROM over time by displaying his/her range-of-motion in bar graph form for up to 12 static tests or dynamic exercises one graph.
- F. **Pain** - allows for the display of the patient's pain severity, pain interference and strength index for up to 6 static tests over the length of the rehabilitation program

VII. HISTORY

Contains a record of all the test data collected on the subject. The HISTORY menu allows editing of the records if errors were made in the test procedure. After viewing the test records, the following options are permissible:

- A. History
 - a. **F2** - Edit - change patient and test information
 - 1. change patient LD.
 - 2. angle, force values, remarks, date, time, etc.
 - b. **F3** - delete
 - c. **ESC** - escape or exit
- B. Reconstruct test - allows the user to construct or create a new test.
- C. C. Change Test ID - moves a test from an incorrect file to a correct file.

VIII. REPORTS

Allow the user to sort and select patient and test information to be viewed on the screen or printed. The way the data is sorted will determine the order in which the information will be displayed or printed. The user may select by categories such as patient ID, sex, birth date, etc.

- A. PATIENT REPORTS - can be sorted (the order to be printed) by:
 - a. patient ID
 - b. last name
 - c. first test
 - d. last test
 - e. next test

AND, then selected (which information will be printed) by:

- a. patient ID
- b. first, last, and next test date
- c. birthdate
- d. sex
- e. race
- f. tester
- g. insurance type
- h. insurance carrier
- i. group
- j. flags
- k. diagnosis code

- B. TEST REPORTS - can be sorted by:
 - a. patient ID
 - b. test date
 - c. machine type
 - d. test type
 - e. dynamic exercise
 - f. tester

AND, then selected by:

- a. patient ID
- b. test date

- c. extension
- d. flexion
- e. stack weight
- f. load time
- g. machine type
- h. test type
- i. tester
- j. test code

- C. **ACTIVITY REPORTS** - are designed for office management. Tests that were once deleted will continue to appear in activity reports when selected. Activity reports can be sorted by:
- a. patient ID
 - b. test date
 - c. machine type
 - d. test type
 - e. tester

AND, then selected by:

- a. patient ID
- b. test date
- c. machine type
- d. test type
- e. tester
- f. test code

IX. UTILITIES

- A. Purge - empty trash 1 time per month.
- B. Index - useful to retrieve lost tests, patients, or memos.

X. ADMINISTRATIVE

- A. Change site profile - allows the user to edit the name, address, phone number, etc. of the facility which forms the letterhead on printouts.
- B. Change user options - allows the user to partially customize the program. For example, the user may set the default status on test options, or track patients by social security number.
- C. Import/export - allows user to move tests and patient information from one computer to another.
- D. Change System Options - Use this selection only with the assistance of MedX technical support. This selection is password protected.
- E. Change Machine Info - Use this selection only with the assistance of MedX technical support. This selection is password protected.

XI. TEXT

- A. Text editor** - word processing system which generates letters in single letter format or mail merge.
- B. Mailing labels** - sort and select patient address labels to be used during mailing. Designed to be printed on single column "gum" labels.
- C. Explanations** - used to create and edit script files which accompany static tests, dynamic tests, and inroad analysis.
- D. Print Pain Survey** - prints a copy of the 12 question pain survey for use when filling in the answer sheet under TEST menu.

XII. DOS "C" PROMPT COMMANDS

Are not part of actual MedX program, but these commands are very important. You must exit MedX program to access the "C Prompt" (C >).

- A. Backup - crucial protection against data loss. Backup procedures must be performed daily using 3 sets of diskettes. Rotate sets every day. On Monday, use set 1; Tuesday, set 2; Wednesday, set 3; Thursday, set 1, and so on.
- B. Date - changes the system date in the computer. MedX program uses the system date to accurately and automatically date-stamp each test and exercise.
- C. Time - changes the system date in the computer. MedX program uses the system time to accurately and automatically time-stamp each test and exercise.
- D. MedX - gets you back into the MedX program.
- E. Park - on older models (SO & SO-Z) only. Protects against data loss by moving hard disk read! write heads away from media. Current computer models do this automatically when powered down.
- F. Format - prepares new diskettes to receive information from the computer.

Software Practice Project 1

1. The software version you are currently using is: _____

2. The following information has been collected from Joe Warren, a 31-year-old clinical low back patient who recently completed 12 weeks of rehabilitation.

- A. 3 angle practice isometric test
- B. 7 angle initial isometric test
- C. 4 week isometric test
- D. Fatigue Response Test (Week 5)
- E. 8 week isometric test
- F. 12 week isometric test
- G. 14 dynamic training sessions

- Suppose that on Joe's 1st visit, some of his patient information was entered incorrectly. Change the and save the following information for Joe:
 - a. address: 2754 SW Archer Road, Gainesville, Fla. 32612
 - b. wk. phone: (904) 392-9781
 - c. date of birth: 11/21/61
 - d. height: 70 inches
 - e. weight: 180 lbs
- Overlay Joe's 7 angle initial IM test and his 8-week IM test. (Hint: use Graph Analysis)
- Overlay the net muscular torque (NMT) and the total functional torque (TFT) that Joe produced on his 12-week IM test. (Hint: use Graph Analysis)
- Determine the amount of strength that Joe gained from his initial 7-angle test to his 12-week IM test. (Hint: use Graph Inroads)
- Determine the average amount of strength through the test range-of-motion that Joe lost from the Pre FRT to the Post FRT. (Hint: use Graph Inroads).

3. Create an isometric test for Joe using the information given below. (Hint: use Reconstruct test option under the HISTORY menu)

0° = 161	48° = 274
12° = 213	60° = 295
24° = 239	72° = 327
36° = 257	

4. Use the force values below to edit the IM strength curve you just created. under the HISTORY menu)

0° = 185	48° = 296
12° = 234	60° = 313
24° = 262	72° = 350
36° = 275	

Software Practice Project 2

1. Your facility has been asked to participate in a study of osteoporosis in geriatric females. Print a report to determine the number of female patients, 65 and older by the end of the year, with a diagnostic code of 1278.01.
2. Your facility has moved and it's necessary to update the heading that appears on your test graphs and explanations. Change the information to:
 - Bonebrake Sports Medicine Center
 - Thoracic Park
 - 100 Shady Tree Lane
 - Benton Harbor, MI 49021
 - Tel. 800-555-1234
 - Slogan: "Give us a break today!"
3. Change the default test options at program start-up to the following:
 - SHADOW: On
 - ENERGY: On
 - RANDOM: Off
 - PRESET: On
 - MANUAL: Off
4. Modify the stock MedX explanation script file for dynamic tests to include the following line at the end of the explanation:
"The starting stack weight is generally chosen to be [% isometricJ of the patient's maximum static effort forthe [machine nameJ." Save this explanation file as DYN2.
5. Use the text editor to write a recall letter. The following sample letter should serve as a guide:
[Letterhead]
[Spelled date]
[First name] [Last name]
[Address 1]
[Address 2]
[Address 3]

Dear [First nameJ:

This is a reminder to let you know that your next visit to our office is scheduled for [Next test dateJ at [Next test timeJ.

If you have any questions, please call me at the center. The telephone is 555-1212.

Sincerely,

Sue Miller Office Manager
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