

Scientifically Validated Medical Technology

MedX computerized testing/strengthening programs provide relief for those in chronic and sub-acute pain¹⁻³, and effective therapy also for those in poor health, susceptible to injury⁴⁻⁵, de-conditioned, or in a state of atrophy following surgery or immobilization. Its function is described in various terms such as rehab, therapy, sports medicine, functional restoration, or medical exercise.

However described, MedX is the first and only physical therapy able to accurately test and safely strengthen muscles of the back⁶⁻¹², neck¹³⁻¹⁶ and knee¹⁷. Its extensive research and development began decades ago at Nautilus Sports/Medical Industries, then owned and operated by Arthur Jones. After selling Nautilus, Jones concentrated exclusively on further development of his computerized testing/strengthening tools.

The University of Florida, Centre for Exercise Science conducted numerous research projects using the equipment Jones built, first at Nautilus and later at MedX, formed in 1986 with headquarters on Jumbo-Lair Ranch in Ocala. Michael N. Fulton, MD, a fellow of the American Academy of Orthopaedic Surgeons and adjunct associate professor in the Department of Orthopaedics, University of Florida, College of Medicine, has been involved in both the research and application of this technology for more than two decades. Dr. Fulton is a consultant to the Ocala Family Physicians Medical Exercise Centre.

MedX medical machines feature elaborate restraint mechanisms¹⁷⁻¹⁸ to isolate targeted muscles. This isolation both eliminates the risk of harmful impact forces and pinpoints deficient areas that can then be addressed during exercise sessions.

MedX has developed a testing procedure consisting of sequential isometric contractions. It tested motor-driven dynamic exercise methods during research, but found static testing to provide far greater accuracy and repeatability.

The MedX clinician administers the test by locking the machine's movement lever at these selected points, or joint angles, along a bio-mechanical range of motion. The range of testing points can be restricted to areas the patient finds free of pain. Once set at a testing point, the patient then contracts isometrically for three to five seconds, presumably to his or her maximum exertion – pain-free.

Through use of a strain gauge the computer software measures force output, or foot-pounds of torque, which it then correlates to the angular position. After completing the test at one angle, the clinician then releases and relocates the movement lever to the next testing point, usually 6 to 12 degrees further along the range of movement. At the conclusion of the entire test the computer software connects sequential static force measurements – like connecting the dots – into what is termed a strength curve.

Comparison to Norms

Both the strength level and curve shape can be compared to age- and gender-matched normative data established through extensive clinical research at the University of Florida. It's when these norms are reached that pain diminishes, typically.

The software can also compare previous test results, selected group results, or a variety of data which can be displayed in tabular or graph format, and also printed.

A rehabilitation program consists of repeating this assessment at regular intervals of one to several weeks, interspersed with weekly or twice-weekly exercise sessions^{8,9,11,16}. The typical treatment protocol involves anywhere from four to 18 total sessions, reimbursed under basic physical therapy insurance coverage by most carriers.

Your patient's reports are available to you at any time, and will be routinely faxed to your office upon the patient's discharge from the program.

The Strengthening Component

During directed, lumbar-specific, cervical-specific, or thigh-specific exercise sessions a weight stack is engaged, set at an appropriate level of resistance based upon test results. Dynamic repetitions are performed within a pain-free arch. The computer tracks duration of each repetition, the number completed, and the range of motion on each.

Effective protocols of testing and exercising combinations have been established through research not only at the University of Florida, but also in numerous independent clinical studies published in peer-reviewed journals.^{1,3,9,11,15}

These machines can also detect fatigability of the targeted muscles. This is determined by use of a three-part session: test, exercise, and then test again. The difference in the pre-exercise to post-exercise strength levels represents the fatiguing effect of dynamic exercise. The amount of fatigue (inroad) will vary among individuals, and is indicative of fibre-type characteristics of the targeted musculature.

Research-Proven Results

MedX has accumulated an impressive array of research findings, much of it published in peer-review journals. Its use has demonstrated increases in bone mineral density²⁰⁻²¹ and has been used in industrial settings to reduce disability⁴⁻⁵ and with geriatric patients²². Its computerized testing machines are used in therapy centres around the world.

Clinician training and educational support is provided independently by UF's Centre for Exercise Science, Colleges of Medicine and Health and Human Performance. Additional research and training has been conducted at the University of California at San Diego.

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