NEURO REHABILITATION.

Patients suffering from a number of injuries or diseases affecting neuromuscular function are among those who can benefit from resistance exercise rehabilitation programs. Stroke, causes brain damage with multiple secondary effects resulting in e.g. reduced muscle strength and power and range of motion, increased spasticity, loss of sensory and motor coordination and compromised postural control. Eccentric muscle actions trigger greater cortical activity and evoke greater impact on the central nervous system than concentric actions. Therefore exercise emphasizing eccentric muscle actions has the potential to transfer exercise benefits to important daily living activities carried out by the patient.

The Challenge

As nHANCE™ allows for self-controlled full range of motion concentric and eccentric overload actions, muscle and neural adaptations should be also be greater compared with standard resistance exercise. The challenge here is to "teach" the nervous system of the patient, through eccentric muscle actions, to make use of more muscle by activating more motor units and hence more muscle fibers.

Proven benefits by nHANCE™

Chronic stroke patients subjected to short-term (8 wks) exercise training using nHANCE™ Leg Press increased muscle strength and power and balance without any adverse effects on spasticity. Perhaps more importantly, performance in daily life activities such as "raise from a chair" showed major improvements. Sixteen exercise sessions were performed, and worth noting, the total time of "muscle contractile activity" was less than one minute!

Exercise prescription by nHANCE™

Preferred equipment with progression: Knee Extension (open-chain), and considering the patient's ability to avoid unwarranted lateral movements move on to Leg Press (closed-chain). For optimal results and QUAD/HAM balance, add Leg Curl (open-chain) use with either QUAD exercise. Calf raises, allowing for full stretch, are executed on the Leg Press. The Squat (most challenging and preferable with aid) could serve the more abled patient in postural balance tasks.

Prescribed dose of exercise: Two weekly sessions of 4 sets of 7 repetitions per any exercise. Allow for at least two days recovery between sessions. Stroke patients use low inertia and add inertia when needed, for comfort and to ensure controlled coupled concentric and eccentric actions.

Research support by nHANCE™

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AGING AND PROMOTING LONGEVITY – FIT FOR LIFE.

If prescribed wisely and with caution, older healthy men and women can take on almost any exercise task typically carried out by younger individuals. Similar to astronauts on missions in Orbit, bedridden men or women and individuals subjected to muscle unloading show loss of bone mass and muscle tissue ("sarcopenia"), and decreased muscle strength, power and endurance. Worsened balance is another main characteristic of physical frailty in old age linked to both tendon and neural degeneration, in addition to muscle atrophy. Proper exercise could combat these effects, improving quality of life, attenuating symptoms of illness and, sometimes even cure disease!

The Challenge

Most challenging would be to maintain, or even increase or improve, muscle size and quality, and related functional performance with increased age. As these age-induced effects are inevitable, retarding the above deleterious effects by eccentric overload eccentric training using nHANCE™ should be a most realistic goal.

Proven benefits by nHANCE™

Older individuals show more robust increases in muscle size, strength and postural balance with HANCE™ compared with weight training. Resistance training improves not only strength, but postural balance, as well. Thus, by employing various paradigms, simulating and "speeding up" the aging process, there are now overwhelming research showing debilitating effects can be counteracted or blunted with nHANCE™. Training with eccentric overload employing nHANCE™ will have positive impact on bone, tendon and muscle health resulting in stronger and faster, leaner, more functional, flexible and elastic muscles.

Exercise prescription by nHANCE™

Preferred equipment with progression: Knee Extension (open-chain), for the best QUAD exercise on earth, then move on to Leg Press (closed-chain) for more functional training. For optimal results and QUAD/HAM balance, add Leg Curl (open-chain) use with either QUAD exercise. Calf raises, so important for older people, allowing for full stretch, are executed on the Leg Press. For the more abled individuals calf raises can be performed on the Squat or the MultiGym. The Squat could serve the in postural balance tasks. Additionally both the Squat and the MultiGym allow the elderly to entertain a full-body work out.

Prescribed dose of exercise: Two weekly sessions of 4 sets of 7 repetitions per any exercise. Allow for at least two days recovery between sessions. Older patients use low inertia and add inertia when needed, for comfort and to ensure controlled coupled concentric and eccentric actions.

Research support by nHANCE™

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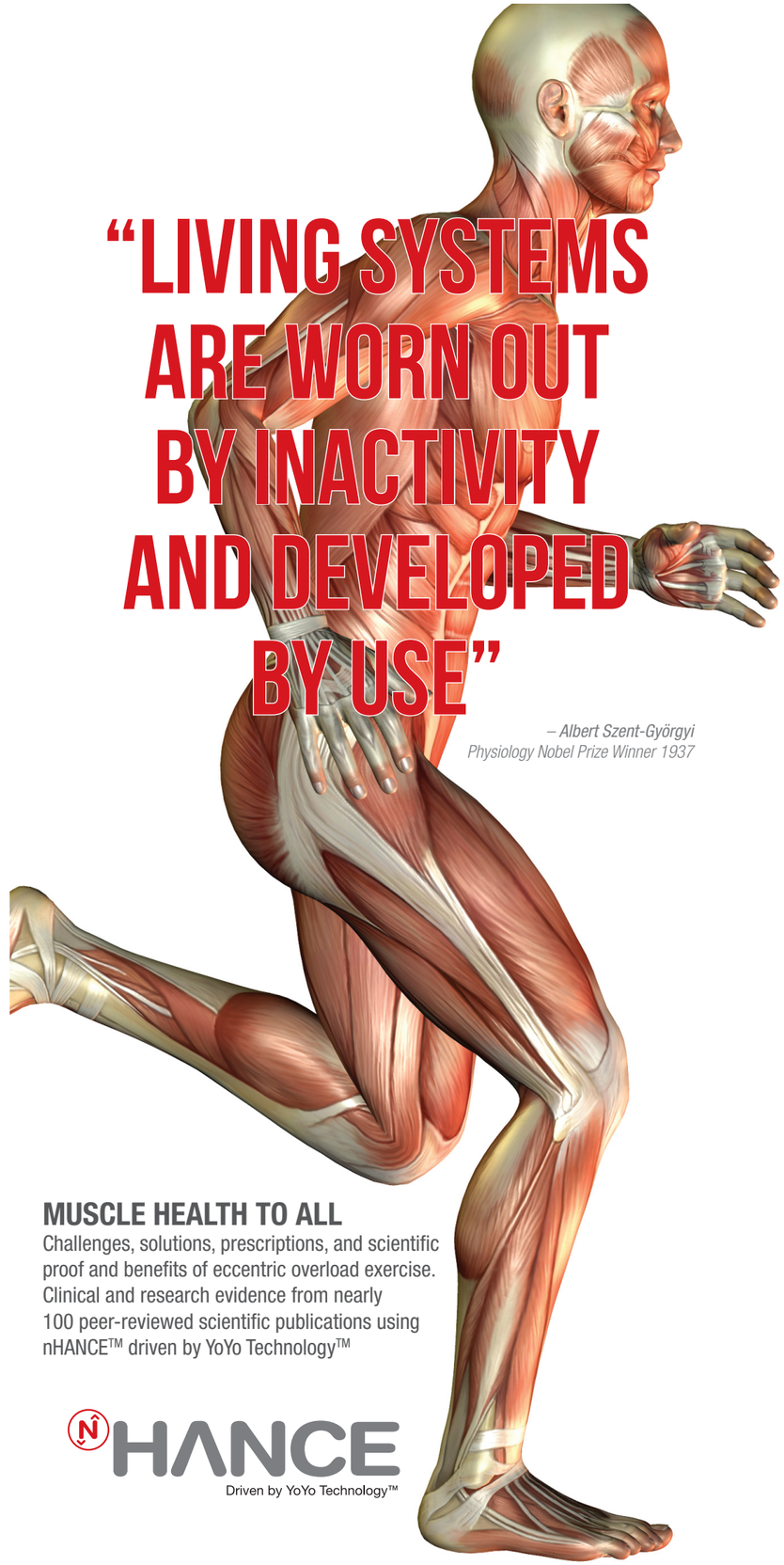

"LIVING SYSTEMS ARE WORN OUT BY INACTIVITY AND DEVELOPED BY USE"

– Albert Szent-Györgyi
Physiology Nobel Prize Winner 1937

MUSCLE HEALTH TO ALL

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BEHIND MOST GROUND-BREAKING INNOVATIONS YOU'LL FIND CUTTING EDGE RESEARCH.

In1895 Alfred Nobel selected Karolinska Institutet, one of the leading medical research universities in the world up to this day, to nominate the winner of the most prestigious international research award in physiology or medicine.

Since then five scientists out of Karolinska Institutet, has been awarded the Nobel Prize. In this creative and highly competitive environment, **the YoYo Technology™** was born. Indeed, on a short-list of the most important innovations and break-through findings of the last century, the university chose to highlight the "**SpaceGym**" developed by YoYo Technology™ and **nHANCE™** founders, along with the pacemaker, insulin, heparin, myoglobin and the gamma knife.

Subsequently a myriad of cutting edge research performed in the areas of muscle and exercise physiology and injury prevention and treatment, validated the benefits. These tasks were set out at highly recognized research centers around the globe including the **University of California, Irvine (CA), Ball State University, Muncie (IN), Texas A&M University, College Station (TX), University of Barcelona, Spain, University of Copenhagen, Denmark, University of Verona, Italy, Nice University, France, Charité University of Medicine, Berlin, Germany, Manchester Metropolitan University, England.** Just to name a few.
Research and development funded by **NASA** and **ESA** allowed astronauts on the International **Space Station** (ISS), to finally enjoy all the medical and physiological benefits of exercise on the SpaceGym.

The collective information gathered from this thorough research and validation and testimonials by professional athletes like tennis phenomenon **Rafa Nadal**, NHL ice-hockey players, soccer players of the best leagues, track and alpine ski stars, sedentary individuals, even 93-yr old men, bed-ridden men and women, patients suffering from stroke and knee trauma, coaches and doctors is the foundation for our solutions to numerous clinical challenges.

"WE DARE TO SHARE!"

For a comprehensive list and update on research and activity "launches" from Karolinska Institutet with partners including nHANCE™ driven by YoYo Technology™, see "Astronaut Exercise Prescriptions Promoting Health and Fitness on Earth" at www.afit.se.

MUSCLE HEALTH: THE KEY TO COMBAT MUSCLE LOSS, DYSFUNCTION AND DISEASE.

Skeletal muscle is by far the largest organ or tissue of the human body. While it's main function is to produce movement, it also possesses a most vital role, serving as a reservoir in controlling multiple important metabolic and hormonal processes. Muscle loss (atrophy) occurs secondary to diabetes, cardiovascular and kidney diseases, different kinds of cancer and the metabolic syndrome, chronic alcoholism, neurologic degeneration, and other debilitating diseases. The vast majority of diseases, typical of modern societies, are accompanied by poor muscle health. Other systems and tissues integrated with muscle, such as bones and tendon, deteriorate in parallel. Maintaining muscle health, or attenuating muscle loss, helps combatting life-threatening illness.

The Challenge

Individuals of all ages, taking on a sedentary lifestyle, or patients suffering from serious cardiovascular, metabolic and endocrine diseases could entertain benefits of eccentric overload training using nHANCE™. The challenge includes maintaining or enhancing muscle size and quality, strength, power, speed and endurance, balance, neural drive and control, and related structures and organ systems by improving muscle health.

Proven benefits by nHANCE™

Indeed, exercise benefits to muscle size, strength, power, endurance, speed, neural drive, contractile and structural protein synthesis, tendons, balance and bone seem to be manifest much faster or with fewer workouts or less time spent, than reported for any other resistance exercise solution known.

Exercise prescription by nHANCE™

Preferred equipment with progression: Knee Extension (open-chain), Leg Press (closed-chain) and Leg Curl (open-chain) combined with either one. A complete full-body work out for the more abled individuals should use the MultiGym.
Prescribed dose of exercise: Two weekly sessions of 4 sets of 7 repetitions per any exercise. Allow for at least two days recovery between sessions.

Research support by nHANCE™

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SPORTS MEDICINE AND ORTHOPEDIC REHABILITATION.

Resistance exercise using eccentric overload is certainly a key tool in preventing injury. Likewise, if employed wisely, such exercise helps rebuilding muscle, strength and power, speed, balance, coordination, motor control and related agilities, but also to improve muscle endurance, after injury.

The Challenge

To reduce the risk of sports related injury, and minimize time required for rehabilitation, allowing for full recovery of muscle size, quality and function, and integrated organs or tissues, following trauma.

Proven benefits by nHANCE™

Programs using either the nHANCE™ Leg Press or Knee extension show high efficacy to rebuild muscle size and function following anterior cruciate ligament injury.

Despite the impressive power offered by nHANCE™, improving power, balance and vertical jump performance, the method is equally safe as standard resistance training equipment. In athletes suffering from long-lasting patellar tendinopathy, training with nHANCE™ Leg Press improves muscle function and reduces pain. Similarly, in volley- and basketball players, highly vulnerable to patellar tendon injury, nHANCE™ Squat training boosts power to extraordinary levels, without provoking increased pain or injury.

The reduction in hamstring injuries, along with improved speed and power in professional soccer players using nHANCE™ Leg Curl is unprecedented, thanks to heavy involvement of the most important knee flexor muscles. Premature muscle fatigue upon return to competition is a common cause for reinjury in athletes. Somewhat underappreciated, nHANCE™ standard protocols also enhance muscle aerobic capacity and endurance, necessary to speed up recovery.

Exercise prescription by nHANCE™

Preferred equipment with progression: Knee Extension (open-chain) when appropriate, and for maximal quadriceps involvement; Leg Press (closed-chain) when open-chain exercise is not an option due to undesired joint stress. Add Leg Curl (open-chain) combined with either one for optimal QUAD/HAM balance.

For upper-body, and in particular shoulder rehab programs use nHANCE™ Squat or MultiGym with proper cables, pulleys and attachments provided. Calf raises, allowing for full stretch, are executed with either the Squat (most challenging), the Multigym or on the Leg Press.
Prescribed dose of exercise: Two weekly sessions of 4 sets of 7 repetitions per any exercise. Allow for at least two days recovery between sessions. Chose inertia such that training for explosive power employs low settings, and training for brute force uses high inertia.

Research support by nHANCE™

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