

Too Weak to Walk

“*Sports Medicine for 95-Year-Olds*” (or what Others Call High-Intensity Strength Training) is the Only Evidence-Based Solution Ever Proposed

By Gary Reinl & Casey Reinl J.D., M.P.S.

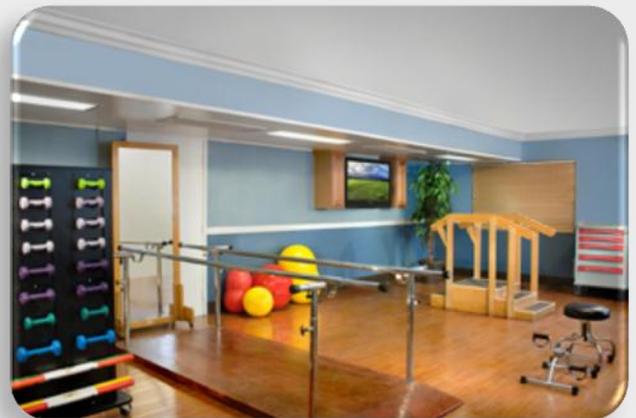


This is the sad result of a failed therapy process. Look closely, these patients are not paralyzed; they are simply too weak to walk!

Traditional Therapy with the option of
“*Sports Medicine for 95-year-Olds*”



Traditional Therapy without the option of
“*Sports Medicine for 95-year-Olds*”



If it were you, which therapy option would you choose?

WANT MORE INFORMATION BEFORE YOU DECIDE? CAREFULLY REVIEW THE FOLLOWING FIVE PAGES

If you are too weak to walk and want to regain your strength, “sports medicine for 95-year-olds,” or what others call high-intensity strength training is, by far, your most clinically validated and versatile option, as well as the only evidence-based solution ever proposed.

Since when, you ask? “High-intensity strength training in nonagenarians. Effects on skeletal muscle” was published by The Journal of the American Medical Association (JAMA) in June 1990. Although profound, the article’s title pales in comparison to the authors’ conclusion statement: *“We conclude that high-resistance weight training leads to significant gains in muscle strength, size, and functional mobility among frail residents of nursing homes up to 96 years of age.”*

The Journal of Gerontology published another anti-status quo article in 1993 entitled “The Etiology and Reversibility of Muscle Dysfunction in the Aged” their conclusion statement shook established belief to the core: *“For the first time, older individuals, both healthy and frail, including those up to 100 years of age, have been shown to respond to high-intensity resistance training with both muscle hypertrophy and marked increases in strength.”*

In June 1994, researchers from Harvard University School of Medicine reported the following in a New England Journal of Medicine article entitled: “Exercise training and nutritional supplementation for physical frailty in very elderly people” *“CONCLUSION: High-intensity resistance exercise training is a feasible and effective means of counteracting muscle weakness and physical frailty in very elderly people.”*

In a well-orchestrated effort to alert both providers and the general public regarding the aforementioned research, the National Institute on Aging produced and circulated their now iconic **“Pumping Iron at 90”** press release in June 1994 (see insert).

And the evidence continues to mount...

The Journal of the American Medical Association published “Effects of high-intensity strength training on multiple risk factors for osteoporotic fractures. A randomized controlled trial” in December 1994 which concluded: *“High-intensity strength training exercises are an effective and feasible means to preserve bone density while improving muscle mass, strength, and balance in postmenopausal women.”*

Journals of Gerontology, Series A Biological Sciences and Medical Sciences published “A randomized controlled trial of progressive resistance training in depressed elders” in January 1997 with the following findings: *“Progressive Resistance Training is an effective antidepressant in depressed elders, while also improving strength, morale, and quality of life.”*

In the year 2000, an article entitled “Sarcopenia: a major modifiable cause of frailty in the elderly” was published in The Journal of Nutrition, Health and Aging. **We believe their conclusion statement is potentially historic, if we are correct, it is the first time anyone ever connected the terms “sarcopenia” and “high-intensity” in a major**

peer-reviewed journal article: *“Sarcopenia can be reversed with high-intensity progressive resistance exercise, which can probably also slow its development. A major challenge in preventing an epidemic of sarcopenia-induced frailty in the future is developing public health interventions that deliver an anabolic stimulus to the muscle of elderly adults on a mass scale.”*

Mature Fitness published “Strength Training Elderly Nursing Home Patients” in April of 2000, proclaiming the following: *“Training intensity appears to be the critical factor for stimulating strength development, as one set of 8 to 12 repetitions to momentary muscle fatigue produced significant strength gains in the program participants.”*

Canadian Journal of Applied Physiology published “The effects of strength training (high intensity resistance training) on sarcopenia” in February 2001, concluding the following:

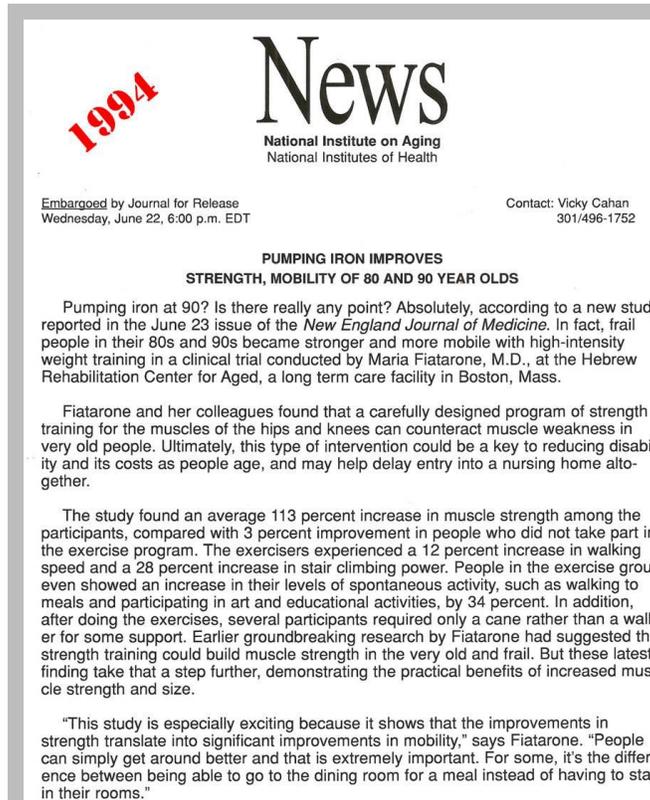
“In order to lessen the effects of sarcopenia, high intensity resistance training should continue over the long term in older adults, to improve functional performance and health.”

Diabetes Care published “High-intensity resistance training improves glycemic control in older patients with type 2 diabetes” in October 2002, reporting the following: *“High-intensity progressive resistance training, in combination with moderate weight loss, was effective in improving glycemic control in older patients with type 2 diabetes. Additional benefits of improved muscular strength and LBM identify high-intensity resistance training as a feasible and effective component in the management program for older patients with type 2 diabetes.”*

Respiratory Medicine published “Heavy resistance training increases muscle size, strength and physical function in elderly male COPD patients -- a pilot study” in October 2004, with the following findings: *“12 weeks of heavy resistance training twice a week resulted in significant improvements in muscle size, knee extension strength, leg extension power, functional performance and self-reported health in elderly male COPD patients.”*

The Journal of Manipulative and Physiological Therapeutics published “Effect of high-intensity strength training on functional measures of balance ability in balance impaired older adults” in April 2005, their conclusion statement reads: *“High-intensity strength training can safely and effectively strengthen lower extremity muscles in balance-impaired older adults, resulting in significant improvements in balance ability and decreased fall risk.”*

British Journal of Sports Medicine published “Exercise and cognition in older adults: is there a role for resistance training programs?” in January 2009, concluding the following:



“Resistance training may prevent cognitive decline among seniors via mechanisms involving insulin-like growth factor I and homocysteine. A side benefit of resistance training, albeit a very important one, is its established role in reducing morbidity among seniors. Resistance training specifically moderates the development of sarcopenia. The multifactorial deleterious sequelae of sarcopenia include increased falls and fracture risk as well as physical disability. Thus, clinicians should consider encouraging their clients to undertake both aerobic-based exercise training and resistance training not only for ‘physical health’ but also because of the almost certain benefits for ‘brain health.’”

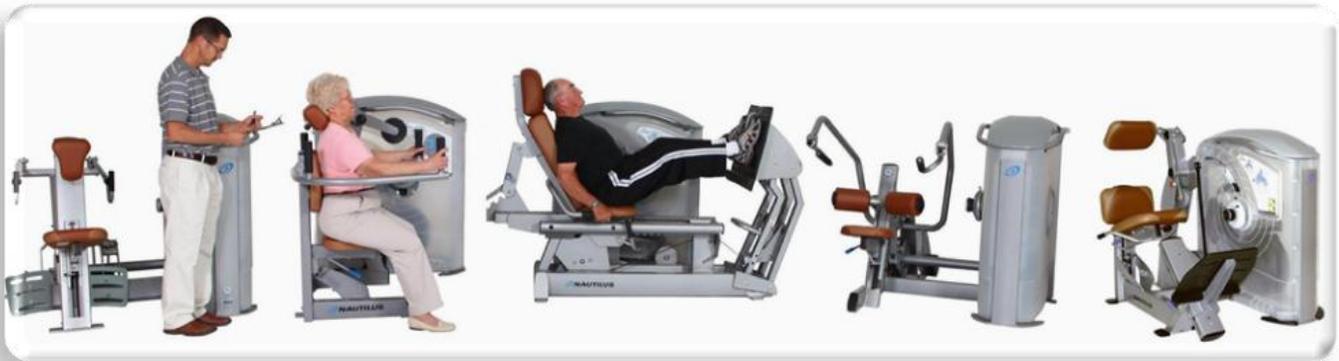
British Journal of Sports Medicine published “Initiating and maintaining resistance training in older adults: a social cognitive theory-based approach” in February 2009, reporting the following: *“Numerous research studies performed in ‘lab-gyms’ with supervised training have demonstrated that simple, brief (20-30 min) resistance training protocols performed 2-3/week following the American College of Sports Medicine’s guidelines positively affect risk factors associated with heart disease, cancers, diabetes, sarcopenia and other disabilities. For more than a decade, resistance training has been recommended for adults, particularly older adults,*

as a prime preventive intervention, and increasing the prevalence of resistance training is an objective of Healthy People 2010.”

Journal of Clinical Rheumatology published “Long-term follow-up of a high-intensity exercise program in patients with rheumatoid arthritis” in June 2009, which stated: *“In conclusion, the majority of the patients who participated in the 24-month high-intensity exercise program continued exercising in the ensuing 18 months. In contrast to those who did not continue exercising, they were able to preserve their gains in muscle strength without increased disease activity or progression of radiological damage.”*

Medicine and Science in Sports and Exercise published “Effect of progressive resistance training on muscle performance after chronic stroke” in January 2010, concluding the following: *“We have shown for the first time in a direct comparison study that high-intensity progressive resistance training, but not cycling or sham exercise, can improve muscle strength, peak power, and muscle endurance in both affected and unaffected lower limbs after chronic stroke by a significant and clinically meaningful amount.”*

And the list goes on...



Safety first: After more than **one million** physician-ordered high-intensity strength-building treatments using Nautilus® machines, there have **never been any reports of injury** in any of the 1000+ senior living facilities equipped with Nautilus® strength-building machines.

Restoration of Functional Strength

When there is **an order for therapy** that includes the restoration of functional strength via high-intensity resistance training, there are three key operational considerations essential for providing the optimal stimulus: **range control, postural support, and resistance control.**

Properly designed high-intensity strength-building machines address these important considerations **objectively and automatically**, thereby solving many of the problems related to restoring or increasing the strength of frail, elderly individuals, especially issues related to physical weakness and/or structural abnormalities.

If, for example, a patient is too weak to walk, or worse, too weak to hold the weight of their body in an upright position while seated in a wheelchair, aptly designed strength-building equipment will allow the patient to begin at a very low resistance level (near-zero) and progress in slight increments while simultaneously providing postural support and range control.

When used *correctly*, the five Nautilus® strength-building machines pictured above will provide the stimulus required to strengthen the core muscles needed to sit, stand, walk, resist falls, and more. For the record, **they automatically and objectively provide; resistance control, postural support, and range control.**

The leg press (center) and the arm press (immediate right) will strengthen the muscles used to move the body from a seated to a standing and back to a seated position. Also, the added leg strength will improve posture and balance. The lower back press (far right) strengthens the muscles needed to hold the torso in an upright position, which improves posture and balance. The neck press (second from the left) strengthens the muscles that prevent the head from falling forward and down, which makes breathing, speaking, swallowing, eating, and seeing easier, and again improves posture and balance. The arm pull (far left) strengthens the muscles that keep the shoulders back, which makes breathing easier and further improves posture and balance.

Cumulative result: More function, less risk.

Intensity

How High is “High”?

High intensity functional strength-building does not mean the patient is lifting heavy weights. For example; if someone is too weak to walk, or worse too weak to hold the “weight” of their body in an upright position while seated in a wheelchair, the amount of resistance needed to achieve “high intensity” on a properly designed sit-to-stand functional strength-building machine is, quite possibly, less than twenty-five percent of their total body weight.

More importantly, and unlike traditional therapy programs that feature parallel bars and wooden stairs, patients that participate in a well-supervised machine-based high-intensity functional strength-building program are **never asked to use a weight that they cannot easily lift and lower** through the full functional range-of-movement at least three to five times.

In fact, if they cannot do at least eight repetitions, the resistance is lowered before their next therapy session. Conversely, the resistance is increased only when the patient can successfully lift and lower the weight at least 15 times.

At the other end of the spectrum, once the patient regains enough strength to walk, resist falls, and climb and descend stairs, they could easily use, on a properly designed sit-to-stand functional strength-building machine, an amount of resistance that is at least 200% of their total body weight.

That’s more than a **700% increase in strength for the entire “sit-to-stand” range-of-motion**, basic functional strength that makes it easier for the patient to move, participate in all other aspects of therapy, and enjoy life ... a strength gain that **far exceeds the scope of a “traditional” therapy** program.

Hence the reason that patients who are given the opportunity to consistently participate in high-intensity functional strength training eagerly endure more therapy in any given session, show continual measurable improvement (thus **avoiding the dreaded “failure to progress” early discharge notice**), achieve a significantly better outcome, and generally score better in all aspects of related functional performance (see a sample of references on pages 2 and 3 of this document).

That said, the **“intensity” would remain consistent** throughout the entire strength-building process in the above scenario because intensity is not determined by the amount of weight lifted; but rather the amount of weight lifted compared to the amount of available strength.

Simply stated, the amount of weight “lifted” during high-intensity functional strength training is **comparably lighter** than the amount of weight that a patient who is “too weak to walk” is **forced** to “lift” if/when they attempt to take a step between parallel bars, or worse, descend wooden stairs.

Everybody Wins

Patients gain needed strength.

Therapists get better clinical results

Staff workload is demonstrably reduced.

Physicians unequivocally practice evidence-based medicine.

The host facility’s reputation and bottom line are enriched.

Parallel Bars



Wooden Stairs



When you are “too weak to walk”, attempting to take a step between parallel bars, or worse, descend wooden stairs, is **far more “strenuous”** (and prone to failure) than properly performed high-intensity functional strength training.

Gary Reinl's "Sports Medicine for 95-year-Olds" News Highlights

"I know that research, sponsored by the government of the United States of America, has proven that frail elderly people (up to 96 years of age) can regain their functional independence, improve their balance and generally feel better by participating in a **high-intensity weight lifting program**," says Gary Reinl.

[Provider Magazine](#), January 1995

"If you have someone that is very weak and not able to lift his own body weight in a seated position, it's clear he won't be able to walk," says Gary Reinl. "But that person could go to a leg press machine and **start with zero weight, and gradually build his strength** until he can start a walking program and enter the traditional rehabilitation process."

[Contemporary Long Term Care](#), July 1996

"What we are doing is bringing the sports medicine model to the senior living industry" said Gary Reinl.

[Milwaukee Journal Sentinel](#), September 1996

"The difference in outcomes in these two cases has nothing to do with age; it has everything to do with treatment," says Reinl. And the treatment we've come up with is **sports medicine for 95-year-olds**. Under our new program, grandmas and grandpas in rehab are pumping iron just like pro football players, and they are **literally leaving their walkers and wheelchairs behind**"

[Nautilus Magazine](#), Spring 1997

"This **"sports medicine"** or high-intensity resistance exercise treatment option, which is currently available nationally, gives 90-year-olds the same opportunity for recuperative therapy as 20-year-olds" says Gary Reinl.

[PT & OT Today](#), July 1997

"Keeping costs per day lower means more profits, and strength training can speed recovery times and help nursing homes cut costs," says Gary Reinl.

[Modern Healthcare](#), November 1998

Gary Reinl offers an interesting parallel in describing the status of strength training in nursing homes. "Looking back at 1965, it was not unusual for skin ulcers to advance to the point of amputation. Today, this would be an outrage resulting in lawsuits, license revocation, survey failures and more. In 1965, nursing homes knew what to do to prevent the condition, but just weren't doing it; now wound care protocols are standard. **The musculoskeletal system should not be allowed to disintegrate either**, but often it happens because it is an invisible deterioration, unlike skin ulcers."

[Nursing Homes](#), February 2001

"In the therapy process, especially with elderly, strength building is the foundation of virtually everything we do. A patient too weak to hold his head up can't get optimal speech therapy. **Sports medicine can help him regain strength**. It has worked for athletes for 20 years. And it works for those who need it even more ... the elderly" says Gary Reinl.

[Section on Geriatrics, American Physical Therapy Association](#), December 1998

"Because the strength-training equipment costs less than half of this amount, the program would appear to provide desirable financial dividends. Of course, if 100 residents were involved in the strength-training program, the **annual cost of care reduction could easily exceed \$200,000**" says Gary Reinl (and associates)

[Mature Fitness](#), April 2000

"The equipment makes it (therapy) less demanding, safer and more effective" Gary Reinl

[Educational Video \(part one\)](#), 2001

"When you have range control, postural support and resistance control provided automatically and objectively by the equipment, your (the therapist's) job is easier and the patient gets better results." Gary Reinl

[Educational Video \(part two\)](#), 2001

Besides running this classic advertorial in Provider magazine in January of 1995 (see insert), Gary, then the general manager of the Medical Division for Nautilus International, reprinted it in his magazine along with a [related feature article](#) in the Spring of 1995 and **mailed a copy to every executive in the senior living industry (more than 25,000 copies)**.

Since his magazine and/or the Provider magazine were seen by virtually every member of management in the senior living industry, the advertorial (and/or the related feature article) pushed the issue into clear view and prompted conversations that otherwise may not have occurred for years, or perhaps ever.

Later that year, Gary began a nearly four year public/media relations campaign that literally involved **hundreds of reporters, thousands of physicians and therapists, and thousands of senior living industry administrators**.

Additionally, in October of 1998, Gary conceptualized, financed and directed a now legendary [ground-breaking study at John Knox Village](#) in Orange City, Florida **to prove the financial viability of "Sports Medicine for 95-year-olds"**.

It was a relentless schedule that included more than 400,000 air miles, nearly 500 hotel stays and hundreds of hours in a car. And it worked. **Today more than 1000 senior living facilities have embraced the machine-based sports medicine strength-building protocol created, organized and promoted by Gary.**



Why Use Nautilus® Strength-Building Equipment?

Nautilus (originally named Nautilus Sports Medical Industries), conceptualized, organized, developed and promoted the concepts of machine-based high-intensity strength building and sports medicine in the early 1970's.

It's less demanding

The human body is like a weight stack on a strength-building machine. Whether you are lifting the weight of your body or the weight on a Nautilus machine, you are *lifting weight*. However, Nautilus strength-building machines are fully adjustable, thereby allowing the user to begin with virtually zero weight and gradually add more weight as needed.

Although the need for zero weight is rare, full body weight at the outset is almost always too much. For example, a male resident weighing 200 pounds who is unable to hold the “weight” of his body in an upright position while seated in a wheelchair, is prescribed therapy services to restore his ability to walk. Because he is not strong enough to lift the weight of his body from a seated to a standing position and, more importantly, because he is afraid of falling whenever he is helped to a standing position, therapeutic activities that involve full body weight are not a sensible option.

Properly designed strength-building machines are the optimal solution because they allow the resident to begin at a very low level and progress at his own rate. This remedial approach is substantially less demanding.

It's safer

Safety is always a concern during the rehabilitative process. When the frail elderly are involved, compromise can quickly convert to failure, further debilitation, and/or injury.

Properly designed strength-building machines are the safest treatment method because the user maintains sound, predictable, controllable, and programmable patterns of movement and receives needed postural support. These safety features, standard on all of the Nautilus machines pictured above, relieve the user of the related fear and permit the therapy team to focus on the recovery process.

While it is possible to safely accomplish some level of improvement with other therapy methods, properly designed strength-building machines are demonstrably safer. It is the preferred treatment method in virtually every modern clinical setting.

It's more effective

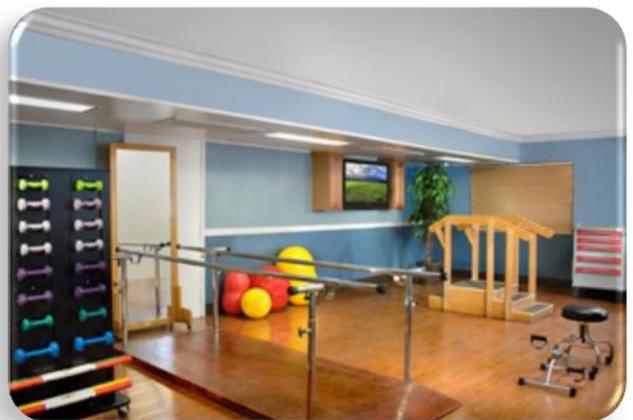
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Traditional Therapy without the option of
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For information on how to get started, contact Gary Reinl at Gary@TooWeakToWalk.com or (239) 272-9943