

The Ten Requirements of Full-Range Exercise Revisited

by Ken Hutchins

In Chapter 42 of *The Renaissance of Exercise*—Volume I (ROE-I), I detailed *The Ten Requirements of Full-Range Exercise* by Arthur Jones. Therein, I listed the Ten Requirements, then explained them as they were intended by Arthur, Ellington Darden, Ed Farnham, and yours truly during the Nautilus heyday.

After expanding on their meaning, I then reviewed and criticized each of the Ten Requirements with the new insights of SuperSlow and Ren-Ex philosophy. To capsulize:

1. Rotary Resistance—invalid
2. Direct Resistance—valid
3. Variable Resistance—valid but moot
4. Balanced Resistance—valid
5. Positive Work—valid but moot
6. Negative Work—valid
7. Stretching—invalid
8. Prestretching—invalid
9. Resistance in the Position of Full Muscular Contraction—valid
10. Unrestricted Speed of Movement—invalid

The score in the dynamic realm is that *The Ten Requirements of Full-Range Exercise* remains roughly 60%-80% valid.

My Current Criticisms of My Past Criticisms

Note that I wrote and published all the preceding in 1994 in a SuperSlow Exercise Guild newsletter predating ROE. The original treatise also included some ideas at the end where I went off into Never-Never Land about using electromagnetics to control speed.

Now that I and others who espouse SuperStatics can reflect on these Ten Requirements and acknowledge that most of these concerns are moot. With statics, we are no longer concerned with friction, with variable resistance, with balanced resistance, with resistance in the position of full muscular contraction, with unrestricted speed of motion, with stretching, with prestretching, with rotary resistance. We do remain concerned with direct resistance.

The new capsulization is as follows:

1. Rotary Resistance—invalid
2. Direct Resistance—valid
3. Variable Resistance—invalid
4. Balanced Resistance—invalid
5. Positive Work—valid
6. Negative Work—valid but moot
7. Stretching—invalid
8. Prestretching—invalid
9. Resistance in the Position of Full Muscular Contraction—invalid
10. Unrestricted Speed of Movement—invalid

The score in the SuperStatics realm is that *The Ten Requirements of Full-Range Exercise* remains only 20%-30% valid.

Note that in terms of *contributions* (not validity), the entirety of the Ten-Requirements only nets a singular 10%. There is nothing unique in listing *positive work*. To paraphrase Mark Twain, why celebrate a requirement "...which the very cattle in the corrals, the Indians in the sage-brush and the stones in the streets are cognizant of?"

But *direct resistance* is a hugely important observation by Arthur. He scored big on this one. Please note that, despite my almost consistent derision of Arthur, that here I bow to the majesty of his mind.

In review of my specific criticisms (past and present):

I add that the explanations in *The Saga of the Seated Leg Curl* provide clarity to the rotary resistance criticism. Also, note therein the links to the four-part *Exercise for the Human Knee*.

In my criticism regarding variable resistance my statement that every exercise machine varies is incorrect. I had yet to consider that a static device was non-variable.

I no longer consider it important to have resistance in the position of full muscular contraction. As I have written and lectured for many years, this position is often impossible to ascertain. And assuming such a position becomes ridiculous.

For instance, the fully contracted position of the latissimus dorsi is to extend one shoulder and put the corresponding elbow behind the back and tight to mid-line as the trunk is extended and rotated to approximate the same shoulder with the opposite hip. This serves no purpose other than to place the muscle into a deep cramp. And it is impossible to design a dynamic exercise machine to track this without passing the lower arm through the torso. Nonsense.

Much the same is true of the brachii biceps. Arthur snookered all his following by building and selling a machine to accomplish this that violated the important principle of putting the biceps in a position to provide active sufficiency.

In Chapter 25 of *Music and Dance*, I explain why friction becomes a non issue with statics and why, in the same line of thought, negative work potential from a static exercise machine or from a static exercise is a non issue.

Of course, we could go deep into the weeds and view the static device as providing negative work in the sense that as the musculature weakens during the exercise—thus the muscle filaments are lengthening somewhat and the materials in the body and in the device are flexing progressively less—the device is providing back pressure against said lengthening, unflexing.

So with SuperStatics philosophy we no longer need be concerned with about 80% of the major Nautilus/Jonesian framework as embodied in the *The Ten Requirements of Full-Range Exercise*.

However—and contrary to some of the gossip on the blogs out in cyberspace—we are not abandoning SuperSlow/ Ren-Ex philosophy and protocol. We still perform some dynamic exercises. And when dynamics are called for—often on equipment that almost all instructors, physical therapists, and subjects do not have access to—SuperSlow/ Ren-Ex is required.

For instance, I have 24 subjects in my clientele. I apply dynamics for the Leg Press for four of these subjects. Therefore, a dynamic leg press is used for 4 out of 24 subjects here. And leg press is an exercise that most instructors have access to.

Another exercise performed dynamically here is Linear Spine Flexion (LSF). It is performed dynamically by 16 of the 24 subjects and used only as a passive stretch for three others. However, the LSF is an exercise/ device that very few instructors or subjects in the world have access to.

A third exercise performed dynamically here is the rotary torso. But it might not qualify as an exercise, per se, as we do not use it for progressive exercise. Once the resistance for a subject is determined, the resistance is never increased in order to inroad to a muscular failure. The movement is

never performed more than four repetitions per side. It is used only in a palliative or preventive way to loosen the spine. And it is regularly used with only four of the subjects.

And then there is the dynamic lubrication procedure for the knee. Of course, it does not really count as an exercise. It is regularly applied to five of the subjects.

All other exercises here are performed statically. My guess is that the percentage for static application is 95% of the exercises performed across the clientele. And given the present state of our art and knowledge, this is now as it should be.

And while still admitting SuperSlow/ Ren-Ex dynamic protocol to the club, I now consider three modes as acceptably worthy inroad protocols in terms exclusively of their inroad efficiency: SuperSlow/ Renex, TimedStaticContractionsm, and hyper.

And of these three protocols only the first two are acceptably safe. All three efficiently load the muscles adequately to effect an EIH in some subjects, but hyper—at least how it is traditionally implemented—involves violating the principle of avoiding all-out maximum effort with fresh muscles. As much as I toyed with this protocol when I was at Nautilus and recognized it as the most efficient inroad means, I have been injured enough to personally avoid it and to preclude it from all instruction and discussion until now. And my only advice is to avoid it like the plague.