

Know Your Functional Abilities & Limitations

Safety and Health through Knowledge!

There are many different shapes and sizes to the people around you. Each of these people have functional abilities and functional limitations. Unfortunately, we can NOT just look at someone and tell what they can safely lift, push, carry and pull. While the overall appearance of a person might give us a “clue” as to what they can do functionally, the only way to know for sure is to test them. As a matter of fact, a quality functional test can very precisely determine an individual’s safe maximum lift (or carry, push, pull, etc.).

Since as early as the 1950’s, researchers (Stover Snook most notably) have carefully studied the concept of determining a person’s safe maximum ability in many different categories. These research studies have been repeated many times over the years and the results have been validated over and over. In the best of these studies, multiple variables were observed and documented as the test subjects worked with progressively heavier loads. The most valuable items being observed were the following:

1) **Subject movement patterns**—At lower work loads, a person only has to put forth minimal effort and only “small” muscle groups have to participate in the work. As the work load increases, these smaller muscles groups need help, and larger or “accessory” muscle groups begin to participate. As the test subject reaches their safe maximum level, they begin to exhibit unsafe actions that are obvious to the trained observer. An example of this is when a person is trying to carry too much weight over a significant distance. Their arms (biceps, elbow muscles) can keep the load up and it begins to drop toward their legs, making it very difficult to walk. This is like carrying a cooler to the picnic table. You might be able to “hike-it-up” once or twice, but then your arms are spent. Next, you might try hiking or shrugging your shoulders and eventually, you need to lean back. At some point, the amount of weight in the cooler or the distance you carry it, becomes “unsafe.” A load that can be properly controlled by the subject through the entire testing process is the Safe Maximum Ability of the test subject.

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Truths Or Myths about “Exercise”

Considerations for Work Process Design

At one, or more, points in each of our lives, we have decided to exercise. Our goals might have been weight loss, heart health, sports training, or some other personal objective. In any case, what we were trying to do was CHANGE something about ourselves. If we really think about it, what we were really doing was trying to change some of our tissues or cells.

I don’t want to get to clinical here, but every cell in our body responded to our exercise efforts. There are many different types of cells (nerve, muscle, tendon, bone,

ligament, organs, etc.) and each of these cells serve a very specific function.

When considering exercises to “change or remodel” each of these cells or tissues, it is important to understand that different types of exercises are required to change the various types of cells/tissues. For instance, the heart and lungs need long/steady endurance related exercises. Some muscles are geared for strength and require strength exercises, while others function as fine motor control tools (like the hands) and require that type of exercise to get better.

Keep in mind, if we do the “wrong” type of exercise or do not allow enough time for rest and recovery, we start to experience pain, degeneration and tissue failure.

So how do we take this information and use it when setting up or designing “work processes?” There is NOT enough space to fully discuss this here, but we will begin the journey and continue this topic in future newsletters.

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2) **Physiological response to work load** - As we work and play, our response to that work can be measured through our heart rate, blood pressure and even our blood chemistry. The harder we work, the more we see these numbers change. It is impossible to be truly working at our "safe maximum ability" and NOT see the expected changes in these physiological factors. In order to keep a person "safe" while at work or play, we need to keep these variables in their respective safe zones.

3) **Perceived Effort Level** - As a work load gets more difficult, the test subject is able to demonstrate very precisely that they can "tell" the load is heavier. In other words, it gets harder. Most of these research studies ask the test subject to select a number on a "scale" that is low for low effort and high for harder levels. At some point, the test subjects told the researchers that the load was "too much."

When HCE Physical Therapists perform functional tests on new hires or existing employees, we employ a testing protocol that incorporates all three of the above measures, plus our advanced knowledge of the human movement system. We are able to determine a person's safe maximum physical ability to within a few pounds, every time. We can also tell if the test subject is "withholding" effort for some reason.

Having this type of ability to determine an employee's true functional abilities or limitations, has saved our clients both in dollars, litigation and productivity.

Truths or Myths...

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Key Points to Consider:

- 1) All tissue **MUST** be stressed in order to survive and grow in abilities. If we don't stress or challenge a tissue it will get weaker! However, if we over stress the tissue it will get weak.
- 2) Bone responded to loading and unloading and gets stronger in the direction of the load being applied. So, jobs that require us to stay in one position will tend to weaken bone and the tissues that attach to bone. We must move!
- 3) The first sign of "overuse" or fatigue is tissue tension. The employee might complain of stiffness or pressure in a joint or soft tissue area. This can occur days and weeks before any pain.

More to come!



Know Your Functional Abilities & Limitations...

When you need to do it again, and again, and again!

The first part of this article discussed some research and key observations that could be used to determine a person's **SAFE MAXIMUM ABILITIES**.

But what about doing these functional tasks over and over? This question was also addressed by many of the research studies. The following table illustrates how the **SAFE MAXIMUM ABILITIES** can be used to determine what someone could be

able to safely do "occasionally" (up to 1/3 of the day), "frequently" (up to 2/3 of the day) and "constantly" (up to the entire day). This information can also be used in designing safe work tasks!

If we ignore this information, we could be asking our employees to do more than they are capable of enduring!

Safe Maximum	Occasional 1/3 day	Frequent 2/3 day	Constant 3/3 day
% of Max 100 %	66 %	50 %	20 %
Sample 75 lbs	50 lbs	38 lbs	15 lbs