

## EDITORIAL

# FUNCTIONAL TESTING: A DIFFERENT PERSPECTIVE

**J.R. Roush, PT, PhD, ATC**

**A.T. Still University, Arizona School of Health Sciences**

I like to walk. Since I was a child, it was a favorite physical activity of mine. Sometimes, I use to intentionally miss the bus to walk home from school. My time walking is a time of reflection, and recently that reflection was focused on the ongoing issue we have in physical therapy and physiotherapy pertaining to function, functional activity, and functional testing.

I recently was requested to respond to a reviewer on a manuscript that I submitted on the validity of a functional test for a physical activity. The functional test that I was using was the closed kinetic chain upper extremity stability test (CKCUEST) and the physical activity was participating in baseball.<sup>1</sup> The reviewer appropriately and accurately questioned the validity of the CKCUEST for those individuals playing baseball. My response came from a reflection during one of my walks. I recently completed some data collection with members of a United States Army Reserve unit while they were completing their yearly physical fitness testing. The fitness testing included push-ups, sit-ups, and running. I thought about sit-ups as a functional test and its relationship to the tasks these soldiers would be required to perform; being placed in harm's way and possibly putting their lives in peril. I queried what is the validity of performing a sit-up and performing the duties of a soldier?

Still the reviewer's question has merit, to the point of trying to answer the question of, what is functional testing? There is little argument that we need functional testing to help patients to progress in their rehabilitation and return to the activities they participated in prior to injury or illness. Some would argue that certain presenters of different continuing-education course have defined functional testing and we really don't have or need a universal definition of the term. It reminds me of

arguments about what is and what is not pornography. That is, I can't define what pornography is, but I will know it when I see or hear it.

As I searched for a more universal definition of functional testing, I reviewed many different sources. The International Classification of Functioning, Disability and Health (ICF)<sup>2</sup> provided several important definitions. Body functions was defined as the physiological functions of body systems (including psychological functions), where "body" refers to the human organism as a whole. Body structures are the anatomical parts of the body such as organs, limbs, and their components, and activity is the execution of a task or action by an individual. If an individual is unable to perform an activity, it is called an activity limitation. The United States Department of Labor<sup>3</sup> provided this definition: "Functional Activity is any physical activity that generically or specifically simulates a work or practical task."

For the lower extremity it is fairly easy to conduct functional testing when we use the ICF definitions. If the function of the lower extremity is to help us ambulate, then their definition of walking is adequate: moving along a surface on foot, step by step, so that one foot is always on the ground, such as when strolling, sauntering, walking forwards, backwards, or sideways. Running is moving with quick steps so that both feet may be simultaneously off the ground. Functional testing for ambulation becomes simple with the tests presently available including the 6-minute walk test or the 12-minute walk run test.

Defining functional testing for the upper extremity becomes much more difficult. An infinite number of functional tasks that humans perform exist with the upper extremity. What we perform as function-

al tasks today are different than the functional tasks we performed one hundred years ago and what may be functional tasks one hundred years from now. It is also difficult to determine where the upper extremity starts and where the torso or the lower extremity stops. I teach the students I work with that the function of the upper extremity is for the shoulder complex and the elbow complex to work together to place the hand complex in a position to manipulate the world around us including the conditions that surround us and affect our lives. This includes manipulating our clothing, tools, food, hygiene, and relationships with other people and other animals. Therefore, defining functional testing for the upper extremity also becomes more difficult.

I have been able to find one definition of functional testing in another discipline. Electrical engineers also have a difficult time defining functional testing. I found this definition through the Carnegie Mellon University Software Engineering Institute: "Functional testing is testing that ignores the internal mechanism of a system or component and focuses solely on the outputs generated in response to selected inputs and execution conditions."<sup>4</sup> The engineers use this definition to determine the errors for electronic equipment such as personal computers. They ignore the components of the device and focus on whether the device works the way it was intended.

I believe we can easily adapt this definition for physical therapy and rehabilitation. During the stages of rehabilitation that pertain to functional activities and return to sport, the focus of the testing would no longer be concentrated on the internal mechanism of a specific joint or muscle or other structure. The testing would focus on how all the components work together to achieve a desired outcome in an activity or task. Prior to this stage, the specific joint, muscle, or structure that was injured had been rehabilitated to the best possible outcome. During functional testing, the focus is to see how the rehabilitated component works with the other structure to perform an activity or task. I can live with this focus, if for no other reason than no one has really come up with something better.

Why is this discussion important? Some may say this monologue is not important. Clinicians are already performing functional testing and defining it is not important. Yet I remember a time when many sports physical therapists were using isokinetic exercise in their practice until insurance companies decreased reimbursement because little evidence existed to show that isokinetic exercise was

related to functional activities. Isokinetic exercise was never intended to be an indicator of the performance of a functional task or activity. Isokinetic exercise is the pure application of biomechanics to improve the health of a muscle or muscle group. Isokinetic exercise was only intended to improve the strength, power, endurance, and overall health of a muscle or muscle group, and this argument fell on deaf ears. Yet, without a healthy muscle, performance of a functional activity or task would not be optimal. We got so hung up on the functional task that we forgot healthy structures were needed for the performance of the task and isokinetic exercise, as an important rehabilitation tool, was in many cases discarded.

Functional testing may provide little or no relationship between the functions of a specific structure and the overall task or activity in which the patient wants to participate. Questioning the validity of the many functional tests because they are not related to the function of a specific structure may lead us to make incorrect conclusions. Functional testing helps clinicians to make decisions when progressing a patient through the rehabilitation process and back to their prior activity level.

I recently had lunch with two friends: one was a physical therapist whose practice setting was sports physical therapy and whose clients included many high-caliber baseball players. The other friend was a former head athletic trainer for a professional baseball team. As we were discussing this topic, it was safe to surmise that working to improve health of a specific structure is not the difficult part of the rehabilitation program. It is still an art to decide when a patient is able to progress their activity level. As one of my friends said; without functional tests, we are left to cross our fingers and pray.

## REFERENCES

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**CORRESPONDENCE:**

Roush JR, PT, PhD, ATC  
A.T. Still University  
Arizona of Health Sciences  
Dept. of Physical Therapy  
5850 East Still Circle  
Mesa, AZ 85206  
[jroush@atsu.edu](mailto:jroush@atsu.edu)