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Correlation vs. Simulation

The issue of correlation vs. simulation is often debated. Correlation offers many advantages for both return to work and new hire testing:

1. Able to develop a huge database because all testing protocols are the same. This ensures greater accuracy and exactness. Simulation only allows for a limited database because the protocols have to change to meet each job demand.
2. The parameters for correlation with CRT testing ensure objectivity, because only objective criteria are used for correlation. In simulated tests, observations, etc., are used and subjective rulings creep into the interpretation. Examples of such rulings are posture, pain, etc.
3. Outcomes with correlation are determined before injury, pain or fatigue occurs. Simulation testing failure can only occur with pain/injury or fatigue/injury. CRT failure rate is 15%, more or less, for all applicants tested in new hire tests. Simulation testing failure rates are usually 0% because they can't truly simulate, or injuries during the testing would prohibit the test itself.
4. Simulation is also using correlation. How long does one simulate a job, 1 hour, 8 hours, or 2 days? Either way, the tester must correlate that time frame to actual work. A correlation test uses maximal short-term testing to correlate to actual work and measures it by objective parameters only.

CRT uses a single plane testing of knees, shoulders, and trunk. The peak torque and work volume are then correlated to all joint movements in all joint planes, because each joint's structures work in concert to successfully complete the movement.

One might question how the testing in the sagittal plane for the shoulders would identify rotator cuff problems (a major injury condition) in the shoulders. If one looks at the arthrokinematics of the shoulder joint, it is identified that the rotator cuff, while it is the major internal/external rotator of the shoulder, also is responsible to provide depression of the humeral head in the glenoid fossa. Testing in the sagittal plane identifies weakness and shows a dip in the strength-duration curve in flexion with rotator cuff injuries and conditions.

Another example is the trunk flexion/extension testing. Can this pick up rotation problems, which are a major preceptor to herniated discs in the lumbar spine? Yes! The largest muscle group in the low back is a combination of muscles called the erector spinae group. Its major responsibility is one of trunk extension, but also must be a strong trunk stabilizer for all motions of the trunk. Therefore, by testing in the sagittal plane, all variables of motion of the trunk are evaluated.

The knee is basically a single plane joint. There is rotation in this joint, but this function is accomplished using flexion/extension muscle groups. Therefore, flexion/extension is tested.

There are other examples, but all the major muscle groups of the human body are tested with sagittal plane testing. Most rotations and abduction/adduction movements position the joints for maximum torque development in flexion/extension.

Another reason to test in the sagittal plane is that the most active moving and work with the human body is in the sagittal plane.