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THE JUSTIFICATION FOR DENIAL OF WORKERS COMPENSATION FOR PRISON
INMATE WORKERS



HOW TO ESTABLISH GROUP WORKERS COMPENSATION POOLS



NO WHEAT, NO CHAFF:
IDENTIFYING THE PROVISIONS OF LEGITIMATE STAFFING SERVICES



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STRENGTH TESTING CAN IDENTIFY MALINGERING

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Reproducibility of effort with performance feedback can be used to document insincere effort. This article presents a case report which notes test/retest consistency (albeit at very low performance levels) in an individual who is frankly malingering. In spite of consistent effort to deceive, malingering *can* be documented with specific equipment by changing the test parameters.

In addition, the clinical relevance of a recent report concerning reproducibility of maximal vs. submaximal efforts is questioned.

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THE ROBINSON STUDY

A recent article in the Journal of Spinal Disorders questioned the reliability of reproducible testing.¹ The authors of the "Robinson study" reported that healthy young subjects could reproducibly demonstrate a 50 or 100 percent effort in strength testing. On the basis of this study, they suggested that "claims that isometric strength testing can be used to determine sincerity of effort or malingering may be unfounded." The Robinson study, however, has little relationship to the clinical reality of patient testing.

In the test protocol used in the study, half of the study group of young, healthy individuals were asked to perform at their maximum effort in two tests, and, after a 10-minute rest, perform at 50 percent effort. With the other half, the procedure was reversed. This group performed two sets at 50 percent effort initially, and, after a 10-minute rest, performed two tests at 100 percent effort.

The results document a significant reproducibility of effort. It is not surprising that healthy subjects could reproduce level of effort, especially with feedback. For the 50 percent effort level, the range of reproducibility was 40 to 60 percent of peak torque. They did not exactly reproduce 50 percent, but some subjects came very close since the previous effort was still fresh in their minds. No comment was made regarding the amount of feedback available during the test.

In another recent study, absence of performance feedback greatly increased variation in maximal and submaximal performance.²

In clinical settings, test and retests are days apart. In treatment settings, patients do have performance feedback. But when testing patients whose reliability is suspect, feedback is usually absent. This may alert malingering patients to be wary of the test and make special efforts toward consistency.

The specific equipment used for the Robinson study was a MedX Lumbar Extension Tensiometer. This equipment has been well-documented as reliable, with effort easily reproducible when used by healthy subjects.³

Reproducibility was confirmed in the Robinson study with correlation coefficients ranging from 0.89 to 0.96 in the 100 percent effort vs. 0.91 through 0.97 in the test/retest of the approximately 50 percent effort. Again, there was a significant range in the ability to produce about half of maximum performance even with just ten-minute separations from maximum performance. Consistent effort can be accurately measured due to the design of this equipment, which has exact anatomic isolation and isometric testing at various point in range. Performance level feedback is available on a screen facing the patient.

Even if submaximal effort is somewhat reproducible with some feedback (as in the Robinson study), test/retest consistency may still be used to document insincere effort.

CASE REPORT

A 34-year-old female hospital employee was given an Agreed Medical Evaluation (AME) in an effort to determine the future course of treatment for her work-related injury. An AME represents agreement between the insurance company and the patient's (applicant's) attorney as to specialist evaluation.

Approximately one year earlier, the employee injured her back while lifting a heavy box. After the injury, she complained of significant back and leg pain. Over the next 11 months, she had various forms of modality-type physical therapy (hot packs, ultrasound, etc.) to treat persistent back and bilateral anterior and posterior leg pains.

Approximately four months after the injury, she had an MRI which revealed a bulging disc at L4-5. (This may represent early disc degeneration.) On this basis, a percutaneous suction discectomy was recommended by her treating orthopaedic surgeon. Because of insurer concerns regarding surgical need, she was referred to a neurosurgeon for a second opinion. The neurosurgeon's evaluation determined that the suction discectomy was not warranted, but that there could be a possible need for fusion. EMG studies were normal. A CAT scan myelogram six months later reported a diffusely bulging disc at L4-5.

The claimant came into the examiner's office five months later, tearful and tense, with pain throughout her entire lumbar area radiating equally into both legs (front and back). Her back pain was more severe than her leg pain. Leg raising ability while sitting straight was normal. And there was no evidence of neurological problems. However, range of motion in the back was extremely limited, with only 10-15 degrees of motion in any dimension. The claimant exhibited significant pain. Review of her MRI demonstrated a diffusely bulging disc at L4-5, but without disc space narrowing or degenerative changes.

DIAGNOSIS - CHRONIC LUMBAR STRAIN WITH DECONDITIONING

A progressive exercise program was advised since at least some of her pain complaints were due to deconditioning because of greatly diminished physical activity since the injury.

The claimant was sent to a spine conditioning center and placed in a progressive exercise program. She was tested on three separate occasions using the type of isometric equipment used in the Robinson study.

Figure 1 documents the summary of test results. Note that the range was extremely minimal from 18 through approximately 30 degrees of flexion to extension. Also, on testing occasions, the torque was likewise minimal. On the initial test, there was an average of 44 foot-pounds. The following week, there was an average of approximately 34 foot-pounds, and on the final test two weeks after onset of treatment, there was an average of about 20 foot-pounds.

Due to the extremely diminished range, only three test points were available for these tests. Nonetheless, effort was apparently consistent since the recorded effort appeared similar. The patient performed the tests with the feedback of a monitor which presents a bar graph to note the level of force in extension. Between the various tests, the patient was placed in a progressive resistance exercise program. According to the tests identified in *Figure 1*, she was progressively *decreasing* her strength in spite of the exercises.

Because of the suspected behavioral characteristics of her pain complaints, the resistance parameters were changed on each testing occasion. On the initial tests (*Figure 2*), a range of 0 to 300 foot-pound scale was displayed as visual feedback to the patient. The patient tried to present a reproducible record by bringing the bar graph to just below the first hash mark (75 foot-pounds in the first test). In the second test (0 to 200 foot-pound scale, *Figure 3*), the first hash mark represented 50 foot-pounds resistance, and the third test (0 to 100 foot-pound scale), the first hash mark represented 25 foot-pounds of resistance (*Figure 4*).

The patient had achieved her goal of having consistently reproducible testing, but had failed to notice that the resistance represented by the first hash mark was considerably *different* on each occasion of testing. Incidentally, she could not remember the amount of resistance from the previous test. The torque represented by *Figure 4* is about 20 foot-pounds. This is considerably less than upper body weight. If this represents true maximum effort, she would be unable to stand up.

On the basis of the test results, the medical report sent to the insurer and attorneys noted that "in summery, the patient has documented a willful attempt to provide unreliable and misleading information to the examiner.

On this basis, the examiner believes that further attempts at medical treatment based on subjective complaints are unwarranted." Due to the evidence, the patient was recommended for psychiatric evaluation. No additional physical treatment programs were funded, and surgery was no longer an option. (The bulging disc was considered an incidental finding.)

THE HAZARD STUDY

With feedback, it is possible for an insincere patient to achieve reproducible effort. However, when this reproducible effort is nonphysiologic, deception can easily be discovered. Submaximal efforts can be consistent if there is an identifiable reference point (the hash mark on the screen, in this case) and a willful effort to deceive.

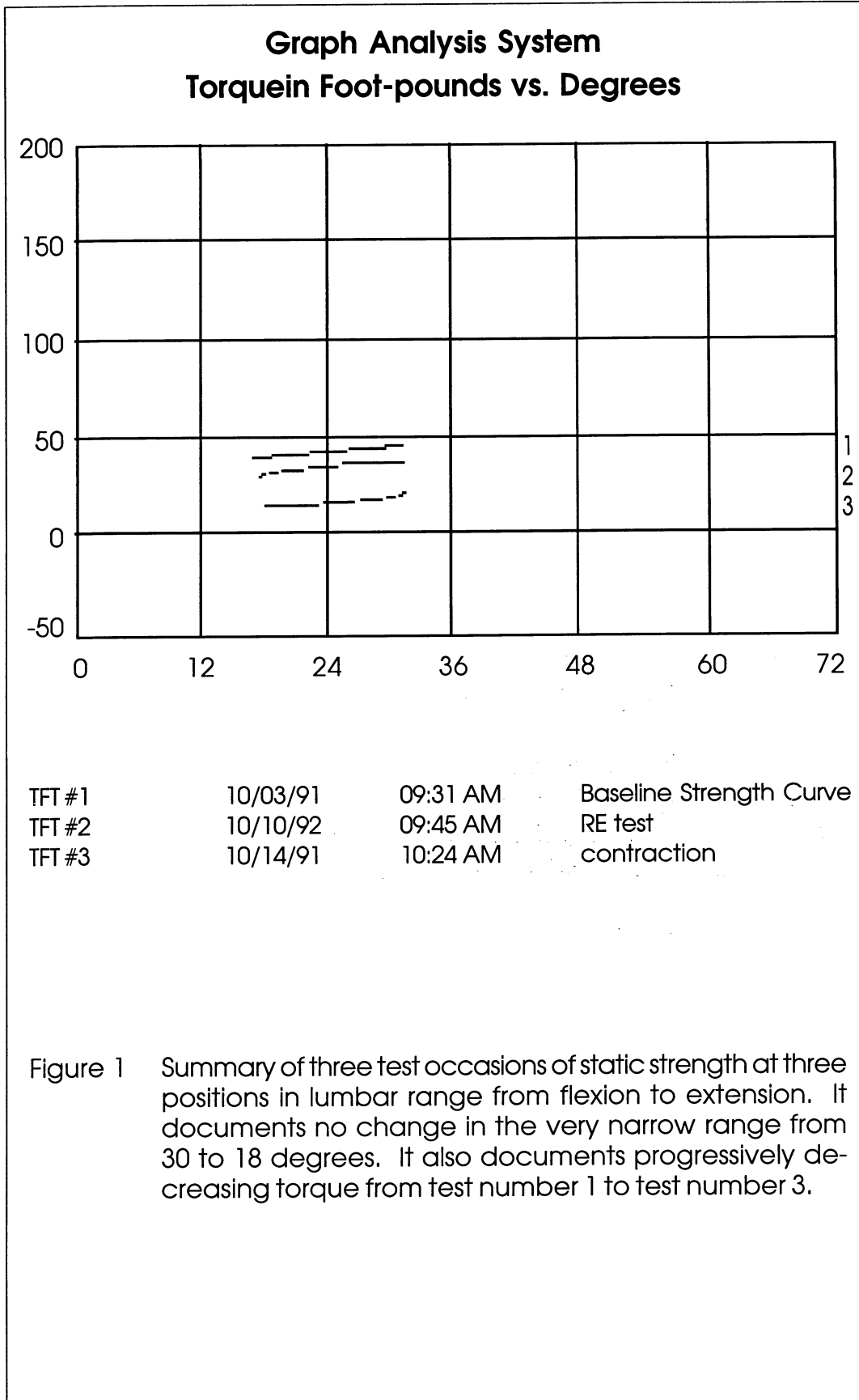
In contrast, in a recent article evaluating the reliability of distinguishing submaximal effort from maximal effort using isokinetic equipment, it became apparent with isokinetic testing equipment *that appearance of effort* (such as facial expression) was more accurate than curve variability.⁴ The authors also noted that some subjects were able to produce consistent submaximal efforts, and conversely, others produced inconsistent maximal efforts.

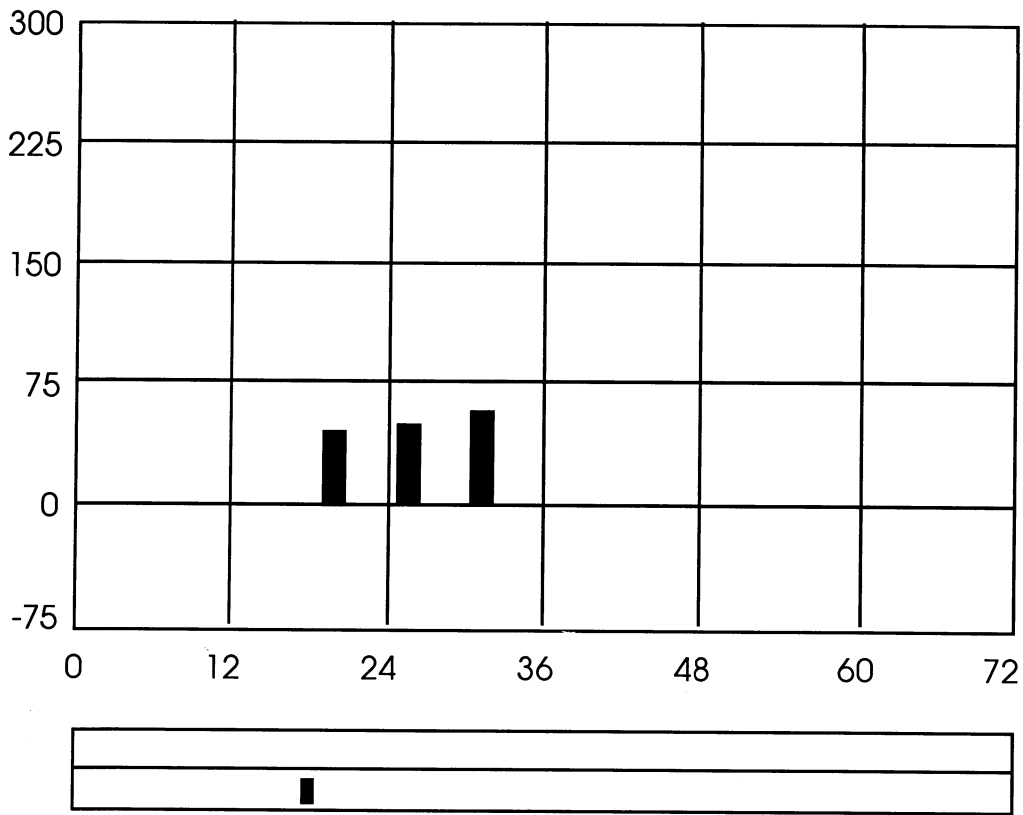
One reason for such contrasting results is that the equipment used in this particular study does *not* provide complete isolation as does the equipment in the present study. Also, the performance curves are on the basis of dynamic activity, and often there is considerable variability due to inherent factors of dynamic testing.

In this case report, observers could *not* identify any variation in patient effort by *observation*. Nor could the testers in the Robinson study. Thus, observing patient performance (on its own) is unlikely to be an effective predictor of performance effort in individuals willfully trying to deceive. Human variability is too great, and it is impossible to standardize observers.

FINAL THOUGHTS

Consistent submaximal efforts with visual feedback can be achieved by a subject anxious to deceive the tester. However, with reliable equipment and the potential to manipulate the test circumstances, the apparent consistent performance can document a patient's willful deception.

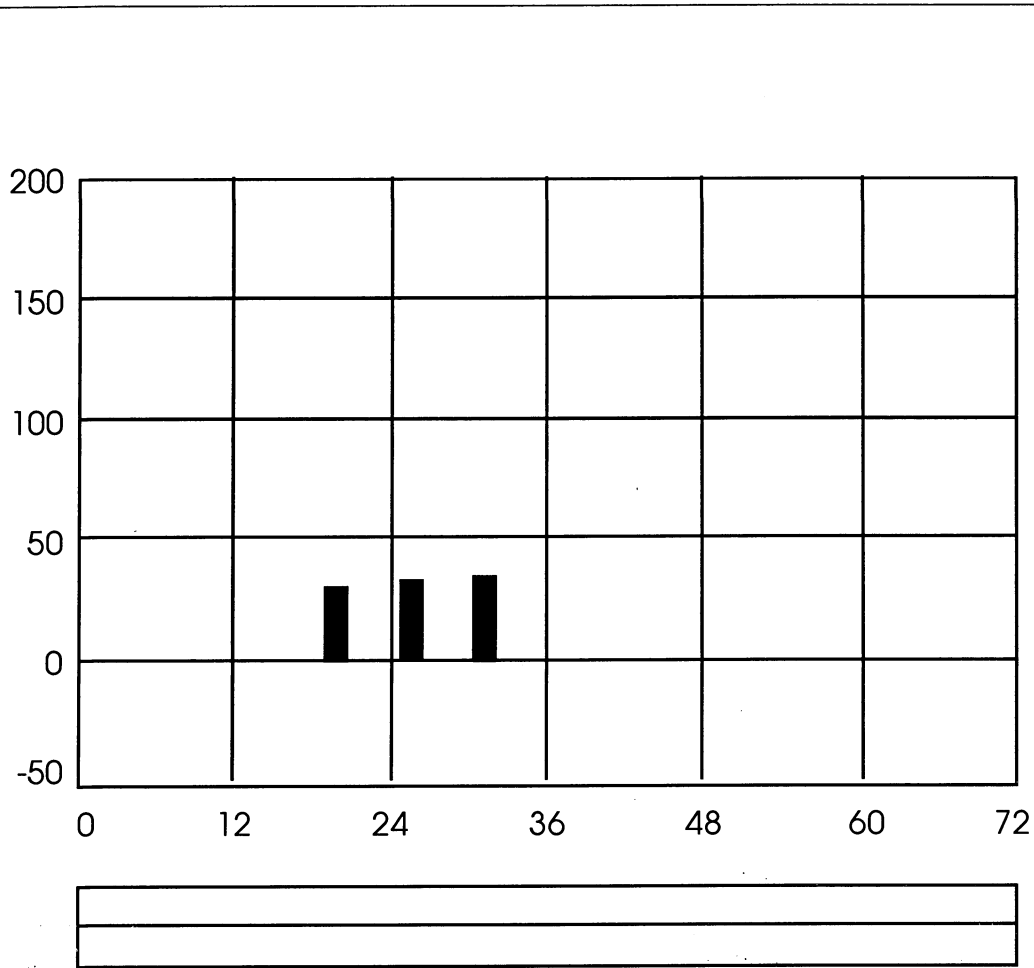




Target: 30.0 Current: 18.0

ESC=Abort F2=Finished F3=Re-take Span=3 Extension=18 Flexion=38 Pts=1

Figure 2 Graphic display of torque production at three test point. Note the scale is 300 foot pounds max. Thus, the first hash mark on the graphic display is at 75 foot pounds. Actual torque production displayed is at about 44 foot pounds.

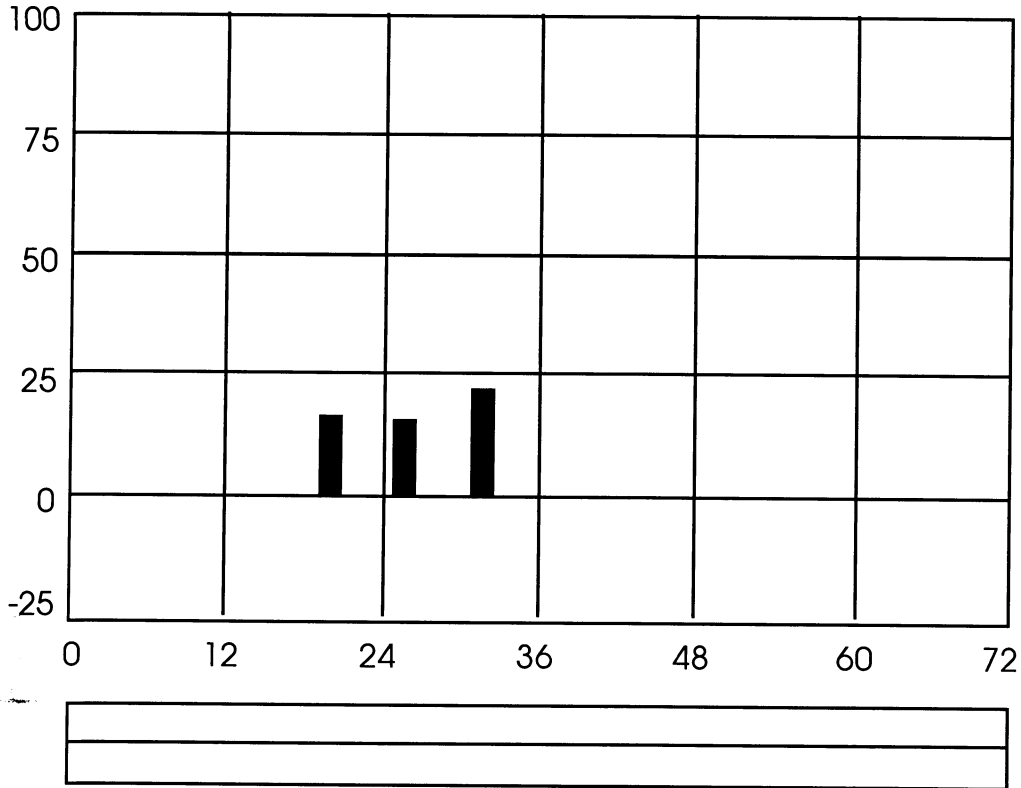


Target: 27.0

Current: 18.0

ESC=Abort F2=Finished F3=Re-take Span=3 Extension=15 Flexion=27 Pts=1

Figure 3 Test number 2 one week later documents similar efforts as displayed by bar graph, not quite reaching the first hash mark. During testing the patient has visual feedback of torque production on the video scree represented in these hard copies. Note that a different scale is used on this test occasion with 200 foot pounds as maximum.



Target: 38.0

Current: 18.0

ESC=Abort F2=Finished F3=Re-take Span=3 Extension=18 Flexion=38 Pts=1

Figure 4 Very similar torque production is displayed with the effort not quite reaching the first hash mark above zero. Yet, a different scale is being used (apparently unnoticed by the patient). Again, apparently consistent effort is documented, but now represents real torque production of about 20 foot pounds.

ENDNOTES

- 1 Robinson, M.E., MacMillan, M., O'Connor, P., Fuller, A., Cassisi, J.E., "Reproducibility of Maximal Versus Submaximal Efforts in an Isometric Lumbar Extension Task," *Journal of Spinal Disorders* Vol. 4, No. 4, 1991, pp. 444-448.
- 2 Graves, J.E., Young, G., Cauraugh, J., Garzarella, L., Carpenter, D.M., Leggett, S.H., Pollock, M.L., "Influence of Knowledge of Results on Variability During Maximal and Submaximal Isometric Lumbar Extension Strength Measurement." To appear in *Research Quarterly for Exercise and Sport* (1992).
- 3 Graves, J.E., Pollock, M.L., Carpenter, D.M., Leggett, S.H., Jones, A., McMillan, M., Fulton, M., "Quantitative Assessment of Full Range of Motion Isometric Lumbar Extension Strength," *Spine*, Vol. 15, 1990, pp.289-294.
- 4 Hazard, R., Reid, S., Fenwick, J., Reeves, V., "Isokinetic Trunk and Lifting Strength Measurements: Variability as an Indicator of Effort," *Spine*, Vol. 13, 1988, pp.54-57.