

clinical conduit



Who benefits from a lumbar stabilization program?

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I think one of the most exciting trends in rehabilitative research over the past few years is the emergence of clinical predictor and diagnostic rules. I believe this type of information will truly lead our profession towards a more standardized level of care and identify preferred patterns of practice.

Last year an article was published in the *Archives of Physical Medicine and Rehabilitation* by Hicks, et al (Volume 86:1753-1762) that provides us with the preliminary development of a clinical prediction rule for determining which of our patients with low back pain will respond best to a program of lumbar stabilization exercises. This was a prospective, cohort study of patients with non-radicular low back pain whose treatment response was categorized as successful, somewhat successful, or failed.

Of the 54 patients that completed the eight weeks of stabilization exercise, 18 were classified as successful (at least a 50% improvement on their Oswestry Low Back Pain Disability Questionnaire (ODQ score). 21 of the subjects improved but not in excess of the minimal detectable difference on the ODQ scale and 15 of the subjects failed due to insignificant change on the ODQ.

This statistic would indicate that we should expect that approximately 1/3 of our acute low back pain patients to have a positive outcome if we just indiscriminately prescribe lumbar stabilization exercises. Frankly, that's not a success rate that any of us would brag about. The author's purpose, however, was to investigate if there were physical findings in the patient's initial exam that would have accurately predicted who would benefit most from this type of intervention.

The exercise program was a typical lumbar stabilization series consisting of abdominal bracing to recruit the transversus abdominus with a variety of distal movements and positions; quadruped limb lifts for erector spinae/multifidus training; and side lying movements to involve the quadratus lumborum and abdominal obliques. A standardized progression criterion based on the individual subject's exercise response was utilized.

The examination that was used to baseline each subject included both demographic and objective measures. Also included was a pain rating scale and Fear-Avoidance Belief Questionnaire. Via regression analysis the authors were able to identify four factors that predicted eventual success or failure with the program of lumbar stabilization exercises.

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Upcoming Course Schedule

Shoulder Course

Oct 7-8 St. Louis, MO
Feb 10-11 Plano, TX

Cervical Course

Oct 28-29 Plano, TX

Knee Course

Dec 9-10 Tulsa, OK

Foot-Ankle Course

Nov 18-19 St. Louis, MO

Lumbopelvic Course

Mar 31-Apr 1 Grapevine, TX

The schedule for additional 2007 courses will be available later this fall

A detailed description of the course content and learning objectives is available at our web site —
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So does glusomine or chondoitin sulfate help with knee osteoarthritis or not?

Neutraceutical products such as glusomine and chondroitin sulfate, have become popular dietary supplements in recent years to combat the adverse effects of knee osteoarthritis. The efficacy and safety of these products has been subject to significant investigation and debate. Recently, the results of a 6-month long, randomized, double-blind, placebo, and Celebrex-controlled, multiple center trial sponsored by the NIH were published in the *New England Journal of Medicine* (2006; 354(8):795-808).

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Lumbar Stabilization Success Prediction Rule continued ...

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Hicks GE, Fritz JM, Delitto A, McGill SM. Preliminary development of a clinical prediction rule for determining which patients with LBP will respond to a stabilization exercise program. *Arch Phys Med Rehab.* 2005; 86:1753-62.

Fritz JM, Childs JD, Flynn TW. Pragmatic application of a clinical prediction rule in primary care to identify patients with LBP with a good prognosis following a brief spinal manipulation intervention. *BMC Fam Pract;* 2005 Jul 14; 6(1):29

George SZ, Fritz JM, Bialosky Je, Donald DA. The effect of a fear-avoidance based PT intervention for patients with acute LBP: Results of a randomized clinical trial. *Spine.* 2003; Dec 1; 28(23):2551-60.

George SZ, Bialosky JE, Fritz JM. PT management of patient with LBP and elevated fear-avoidance beliefs. *Phys Ther.* 2004; Jun; 84(6):538-49.

The preliminary prediction rule for success with stabilization treatment was the presence of the following four findings:

1. Positive prone instability test (spinal extensor activation decreasing pain provocation with PA glides)
2. Presence of aberrant movement during active trunk motion
3. Straight leg raise over 91°
4. Patient age below 40

When at least three of these four findings were present the positive likelihood ratio was 4.0. This means that the pretest probability of 33% success was significantly increased to 67%.

The authors also develop a rule to predict clinical failure using a program of lumbar stabilization exercises. These four findings were *almost* the inverse of the rules for success. The findings included:

1. Negative prone instability test
2. Absence of aberrant movement during active trunk motion
3. FABQ physical activity subscale score of less than 9 ("less" fear-avoidance behavior)
4. No hypermobility detected with spring testing (lumbar segment mobility evaluation)

When at least two of the four above findings were present the likelihood for at least some success dropped from a pretest probability of 72% down to 32%. This finding would suggest that patients with these physical parameters would be more likely to benefit from alternate interventions.

This is exactly the type of research information that I think should be guiding our practice, particularly with diagnoses such as lumbar segmental instability which seems to be void of a consistent and verifiable definition. Rather than depending upon a diagnosis to assist us in prescribing a treatment plan we can prescribe an intervention based on a collection of measurable impairments.

"When fabricating a custom orthotic do you recommend subtalar neutral casting or the foam impression tray method?"

E.B., PT - Illinois

Question of the Month



That's a good question and I want to preference my recommendation by saying that either method is acceptable, however, I prefer the "accuracy" of the subtalar joint neutral casting in prone non-weight bearing.

I put the term accuracy in quotes because many studies have shown significant intercaster variability with this technique. That said, it still seems to have the best consistency and accuracy when compared to other traditional methods such as

foam impression trays or laser scanning.

In a study by Laughton, et al from the *Am J Podiatr Med Assoc* in 2002 they showed the method of replicating neutral was influenced by the negative impression technique but that the non-weight bearing casting method may be the best at capturing the forefoot to rearfoot relationship. Based on this study some payers are now re-

questing that custom orthosis be fabricated from a casting technique.

The bigger debate may be if the subtalar joint position is the appropriate position from which to make posting decisions. While some believe that the orthotic's benefit is largely proprioceptive related I do think that corrective posting works best when based on the talonavicular congruent position obtained through non-weight bearing casting.

Questions you would like addressed in a future issue can be sent to mulliganpt@comcast.net

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Glucosamine/Chondroitin continued -

Important Studies

1. McAlindon TE, et al. Glucosamine and chondroitin for Tx of OA: A systematic quality assessment and meta-analysis. *JAMA* 283: 1469-1475, 2000.
2. Tanveer E et al. Glucosamine and chondroitin for treating symptoms of OA: Evidence is widely touted but incomplete. *JAMA* 283:1483-1484, 2000.
3. Reginster JY, et al. Long-term effects of glucosamine sulfate on OA progression: a randomized, placebo-controlled trial. *Lancet* 357:251-256, 2001. *Arch of Intl Med* 163:1514-1522, 2003.
4. Clegg DO, et al. Glucosamine, chondroitin sulfate, and the two in combination for painful knee osteoarthritis. *New England J Med* 354:795-808, 2006.
5. Hochberg MC. Nutritional supplements for knee OA—Still no resolution. *New England J Med* 354:848-850, 2006



In this study, over 1500 subjects were randomly assigned to one of five groups – glucosamine, chondroitin sulfate, both glucosamine and chondroitin, Celebrex, or a placebo. Each subject was further stratified into a mild, moderate, or severe knee pain category. The primary outcome measure was the pain scale from the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).

The results were somewhat surprising in light of earlier research. Glucosamine and chondroitin alone or in combination did not significantly reduce pain as compared to the placebo. As compared to the rate of pain relief in the control group, the improvement in the glucosamine group was 4% higher, 5% with chondroitin, 7% in the combined, and 10% better with Celebrex. The authors did find a much more significant pain relief benefit with the combined dietary supplements in subjects classified as moderate or severe pain.

These findings, although not necessarily discouraging, are in contrast to many previous investigations. What may account for some of this conflicting information? First of all, the placebo benefit was quite high as might be expected. Also, many previous randomized, placebo-controlled studies have found beneficial symptom reduction when evaluated by different means. Finally, it is important to note that no significant adverse effects were noted in the study.

I believe the general consensus at this time is that the combination of glucosamine and chondroitin sulfate may have an additive effect for patients with severe knee osteoarthritis and that a three-month trial is an adequate time – frame in which to gauge its benefit.

In regards to conservative management I would recommend the following interventions to supplement your patient's dietary supplements:

1. Patient Education including activity modifications and weight control
2. Alteration of applied forces through appropriate shoe wear, orthotic therapy, and “unloader” bracing
3. Improved mobility in the posterior capsule and increased hip, knee, and calf flexibility
4. Improved lower extremity strength and endurance (particularly the quadriceps)

Fear factor

A very interesting guest editorial was offered by Steven Z. George, PT, PhD a few months ago in the *Journal of Orthopedic and Sports Physical Therapy* (2006; 36(5):264-66). He eloquently reminded me of the importance of considering the patient's psychological perspective regarding their injury. It is not unusual for a patient to be as fearful of their pain and apprehensive about our therapeutic interventions as the potential disability the injury could produce. In other words the fear of pain may be as disabling as the pain itself.

So how can we account for this potential variable in our treatment plans? Are there tools we can employ to help us identify patients where this could be a significant concern? The answer to both questions is “Yes”. In his editorial, Mr. George references a number of valid, self-report questionnaires that can be employed to help us gauge this potentially confounding variable.

The one that I'm most familiar with is the Fear Avoidance Belief Questionnaire (FABQ) specific to chronic low back pain published by Gordon Waddell back in the early 90s. The FABQ is a 16-item questionnaire divided into “physical activity” and “work” sections. Each item is scored on a 0-6 scale with the higher number indicating an increased level of fear avoidance beliefs. When combining both sections the maximum score on the questionnaire is a 96.

Scores above 14 on the physical scale are considered “high” and may suggest the patient is likely to be an “avoider”. Researchers have also found the work scale to be a good predictor of prolonged disability. Scores above 34 are associated with increased risk of not returning to work while scores under 29 indicate a decreased risk of not returning to work. It is important to note that a high FABQ score is not indicative of a serious medical condition but of a poor return to work prognosis secondary to psychological influences.

Screening for patients with high fear avoidance beliefs and subsequent high risk of prolonged disability may directly influence your treatment plan. With this type of patient I would suggest that an emphasis on pathology education and a graded, gradual exercise program with progressions dictated on dosage and not on symptom response to be the most effective interventions.

You can find a copy of the FABQ with a Google search or at its original publication in *Pain* 1993; 52:157-168



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Sometimes your actions are so loud; others can't hear what you're saying



Supraspinatus Strengthening

Rehabilitation Exercise Technique

A classic exercise called the "empty can" was initially described by Dr. Jobe back in the early '80s as a means to target the supraspinatus for strengthening. While it enjoys a great deal of popularity I prefer the short arc military press (SAMP) as a superior and safer method for emphasizing supraspinatus activity. You may ask why the preference? Let me review a number of considerations



Short Arc Military Press Empty Can Exercise

1. Deltoid activity is decreased in the SAMP as compared to the empty can. (Reinold MM, et al. *JOSPT*. 2004; 34:644-52)
2. The lever arm for the SAMP is shorter and can be lengthened as symptom tolerance allows.
3. Supraspinatus EMG recruitment in the SAMP is as good as or better than the empty can. (Townsend H, et al. *AJSM*. 1991; 19:264-72.
4. When performed incorrectly (elevation above 80-90°), the empty can exercise can be a provocative or irritating maneuver.
5. The abductor moment arm is decreased with the internal rotation of the empty can exercise which increases the demand on the supraspinatus. This may not be tolerated well in more acute stages.
6. The empty can requires good rotator cuff balance which may not be present in the symptomatic patient
7. Scapular anterior tipping and internal rotation are increased with the empty can maneuver which decreases the subacromial space. (Thigpen CA, et al. *AJSM*. 2006; 34:644-52)

Description of the Short Arc Military Press Exercise:

The short arc military press can use dumbbells or elastic tubing for resistance. The exercise is performed in the scapular plane with the elbow bent. The hands are raised from about the level of the chin to the level of the eyes. This amount of movement represents the first 30° of scapular plane elevation. As with all exercise it is performed in a smooth, rhythmic fashion.



Featured Home Study Program

Orthopedic Examination and Treatment of the Hand and Wrist

Another interesting article was published last year in the Archives of Physical Medicine and Rehabilitation by Wainner, et al. (2005; 86:609-618) regarding a clinical prediction rule for the diagnosis of carpal tunnel syndrome. This prospective study was designed to examine the diagnostic accuracy of many physical parameters and special tests associated with carpal tunnel syndrome.

The study identified five parameters, that when all positive, significantly increased the probability of the condition. These parameters included symptom relief from "hand-shaking", an increased wrist-ratio index, reduced median nerve area sensation, high symptom severity scores, and being over 45 years of age. While the authors conclude that further investigation is required to validate the test-item cluster and to improve point-estimate precision I would highly recommend a detailed review of this article.

If you need a basic review of the examination and intervention strategies for common orthopedic pathologies of the wrist and hand you may benefit from our home study on Wrist and Hand Injuries. This two-part inservice can be viewed or read free of charge. A post-test for CEU credit is available at <http://www.continuing-ed.cc/homestudy.htm> for a reasonable fee.

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