Sacroiliac Joint Dysfunction, evaluation and physical therapy management.

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Course Description

- The purpose of this course is to explore the evidence surrounding the evaluation and treatment of the pelvis in performing artists.

Course Objectives

- Understand the anatomy of the sacroiliac joint and its relationship to movement.
- Examine the published evidence of sacroiliac joint motion studies.
- Examine the published evidence on the evaluation of the sacroiliac joint.
- Examine the evidence on the intervention of the sacroiliac joint.

Sacroiliac Joints

- Most have described the sacroiliac joint articular surfaces as a “kidney bean” or “L” shaped with its convexity located anteriorly.
- The sacroiliac joints is usually located along the S1, S2, and S3 sacral vertebrae.
The Sacroiliac Joint: The Problem.

Different schools of thought.
- The SIJ has little to no motion and barely moves.
- The sacroiliac joint move in more than 3 different degrees of freedom, allowing for independent innominate movement of anterior/posterior tilts, up-slips, down-slips, in and out flares, as well as sacral torsions, side-bending, flexion and extension lesions/problems.

Is the sacroiliac joint a “real” joint?

- Evidence shows that the sacroiliac joint:
  - has synovial fluid.
  - has articular cartilage, hyaline on the sacral side, more fibrous on the ilial side.
  - has a fibrous/synovial joint capsule.
  - degenerative changes develop with age.
  - and it moves.
- The sacroiliac joint is a diarthrodial joint.

The Myth of Independent Innominate Motion

- Can the left innominate bone move anteriorly or posteriorly independently of the right innominate bone?
  - Osteopathic Muscle Energy Theories.
- For independent motion to develop sufficient movement must occur in the symphysis pubis.
Symphysis Pubis: an amphiarthrodial joint

- The joint is not considered a synovial joint and moves very little.
  - LaBan in 1978 showed with standard radiography that during alternate weight bearing the symphysis pubis moves about 2 mm.
  - Recent studies by Walheim and Meissner show that under normal conditions (not pregnancy) the symphysis pubis moves between 1.0 and 2.0 mm maximally.

Symphysis Pubis

- Thus, although these studies show that the symphysis pubis moves its motion is extremely small and certainly not enough to allow any sort of definable or even observable independent left or right innominate bone motion.

So how does the sacroiliac joint move?

- To understand how the sacroiliac joint moves one method is to examine its articular surfaces.
  - The sacroiliac joints can only move along the path of their articular surfaces.
- As with all synovial joints the types of movements that can occur are determined by the contour or shape and the orientation of the articular surfaces.
Articular Surfaces of the Sacroiliac Joints

- Solonen examined 30 pelvises and showed that a wide variation in the articular surfaces exist between individuals.


Median sagittal angle describes the SIJ’s articular surface from a frontal view

- At S1 the average angle was 11° with the apex of the inclination angle formed caudally.
- S2 0° or a flat sagittal surface with the apex angle forming caudally.
- S3 10° with the apex of the inclination angle formed cranially.

The angle made between the articular surfaces in the horizontal plane

- The inclination angle thus could have its apex dorsal or ventral.
- At S1 the average inclination angle was 21° (range 0-75°) with a dorsal apex.
- S2 12° degrees with a dorsal apex.
- S3 10° (range 0-45°) with a ventral apex.
The SIJ articular surfaces from a horizontal perspective

- The inclination angle thus could have its apex dorsal or ventral.
- At S1 the average inclination angle was 21° (range 0-75°) with a dorsal apex.
- S2 12° degrees with a dorsal apex.
- S3 10° (range 0-45°) with a ventral apex

Conclusion from Articular Surfaces Topography

- The orientation of the articular surfaces are usually not in any one plane.
- Motion likely occurs in all three planes, sagittal, frontal, and horizontal (tri-plane motion).
- The articular orientation shows why with posterior pelvic tilt the innominate bones “flare out” and with anterior tilt they “flare in”.
- Examining the orientation of the articular surfaces allows understanding of why “in and out flares” have been described.

Sacroiliac Joint Movement

- A key concept in understanding SIJ motion is that the left and right sacroiliac joints are:
  
  two structurally separate joints that functionally act as one single joint.
Motion of bicondylar joints

- Another important feature of bicondylar joints is that:
  
  movement of one bicondylar joint must be accompanied by a correlative movement at the other bicondylar joint!

An example of another bicondylar joint: The temperomandibular joint (TMJ)

- The left TMJ can not move without also a correlative movement developing in the right TMJ.
- Movement of one joint requires or demands movement of the other mated joint.
  - This is because the singular mandible bone forms both the left and right temperomandibular joints condyles.

Sacroiliac Joint Motion

- The innominate bones move either anteriorly or posteriorly
- Together or symmetrical motion.
  - As in anterior or posterior tilt of the pelvis.
- Separate or asymmetrical motion.
  - During gait where one moves anterior the other posteriorly.
Evidence on sacroiliac joint motion

- The first study was performed by Zaglas in 1851.
- Zaglas observations showed enlarging and contracting of the pelvic inlet and outlet diameters on backward bending of the spine.

Evidence on sacroiliac joint motion

- In 1930 Chamberlain demonstrated mobility of the sacroiliac joints by determining the difference in heights between the two pubic rami on A/P radiographs with patients standing on one leg.

Evidence on sacroiliac joint motion

- In 1936 Pitkin and Pheasant described movement of the sacroiliac joints. Pitkin and Pheasant describe motion as primarily paired motion of the innominate bones where the innominate bones move in a symmetrical or asymmetrical fashion.
Evidence on sacroiliac joint motion

- Weisl in 1954, studied the movements of the sacroiliac joint using a radiographic method.
  - Movement of the sacral promontory was used to define motion of the sacroiliac joint.
  - These early studies lacked understanding of how the sacroiliac joint moves.

- Colachis in 1963 examined sacroiliac joint motion by inserting Kirshner wires or pins into the left and right posterior innominate bone of 12 adult medical students.
  - Nine different positions were used to examine for movement.
  - Colachis found 10 mm. of movement between the innominate bones.
  - Weakness is that no wires or pins were placed in the sacrum.

- Frigerio, in 1974, performed the first study of RSA on a male cadaver pelvis. The cadaver's left hip was extended 15 degrees and abducted 30 degrees.
  - Frigerio found up to 26mm. of movement when comparing the iliac crests to the sacrum.
  - Regrettably, no angular motion was measured.
Evidence on sacroiliac joint motion

- Egund in 1978 examined 4 subjects using the RSA method. RSA is a method where two orthogonally directed radiograph tubes take radiographs of the pelvis.
- Tantalum marker balls were placed on the posterior aspect of the sacrum and two ilia bones to define the bones and thus describe movement.
- Subjects were measured during many different postures and movements.
- Egund found the maximum sacroiliac joint movement was 2 degrees of rotation.

Evidence on sacroiliac joint motion

- Lavignolle, in 1983, studied 5 subjects.
- Subject’s trunks were stabilized supine in a special apparatus while an investigator passively flexed the right hip to 60 degrees and extended the left hip by 15 degrees to simulate walking or running.
- RSA was used to determine motion; however, no markers were used only points on the innominate and sacrum bone.
- Motion was determined from these points; the average sacroiliac joint movement measured 10-12 degrees in the five subjects.

Evidence on sacroiliac joint motion

- 1988 Cibulka, Delitto, and Koldehoff performed a study on 20 patients with signs of sacroiliac joint dysfunction to try and determine the nature and relative disposition between the left and right innominate bones assume in patients with sacroiliac joint dysfunction.
- This study was important in showing that the pelvic obliquity that develops in patients with sacroiliac joint dysfunction is the result of an equal and opposite (one anterior the other posterior) tilt of the left and right innominate bones.
Evidence on sacroiliac joint motion

- Sturesson in 1989 used an RSA method to describe motion of the sacroiliac joints. Sturesson examined 6 patients (2 females, 4 males) using an RSA technique to determine the quantity of motion available in the sacroiliac joints.
- Patients were studied with many different movements.
- Motion of the sacroiliac joint was noted to occur in all three body planes with most (90%) of the motion developing in the sagittal plane.
- The amount of sacroiliac joint motion measured was very small (only 2.5 degrees of movement at the most).

Roentgenstereophotogrammetric analysis RSA

- A radiographic technique used to determine motion between 2 bodies or objects.
- RSA is considered a very precise and reliable method of measuring motion between two objects.

RSA (continued)

- The biggest problem with RSA is its validity. That it really measure what it purports to measure.
- When using RSA to measure motion a number of specific criteria must be met.
- When describing a free body object the markers must be placed in such a way that they represent validly or fully the free body objects.
Roentgenstereophotogrammetric analysis (RSA)

For example if we were to describe a box the markers that define the box markers would be placed evenly or isotropically in all of the corners of the box and not just one side.

Errors arise when markers are placed in just one plane (located collinear), this sort of placement does not allow representation of the free body object and invalidates the mathematical procedure.

In Sturesson’s study the patient moved supine to standing, and then another radiograph was taken.

The method currently used to study sacroiliac joint motion is to use tantalum balls to define the ilium and sacrum bones.

The two radiographic tubes can only measure two dimensions while the third dimension is determined by using a mathematical procedure called the least squares method.
Roentgenstereophotogrammetric analysis (RSA)

- Thus the markers should be placed in such a way that the markers fully represent the free body object.
- Failure to do so invalidates the mathematical least square procedure used to calculate the third dimension.

Making inferences using RSA

- Care must be taken when making inferences from studies that use RSA when studying sacroiliac joint motion.
  - New studies are needed that fully represent the ilia and sacrum.
  - Difficulty in placing tantalum balls in the ischium or pubis, must find new method of defining the objects.
  - This is especially true if considering the bicondylar sacroiliac joint motions.
- Or new technology that can do the job of measuring complex motion is needed.

Studies on Sacroiliac Joint Motion Coupled with Hip Joint Motion

- Smidt, in 1995, examined 32 normal subjects (15 men, 17 females) with a Metrecom an electrogoniometer while standing in a position where one hip was fully flexed and the other fully extended (reciprocal stance position).

  Markers were placed on the left and right ASIS and PSIS’s, which limited analysis to just two dimensions.

  The mean sagittal-oblique composite motion for the group was 9°, while mean oblique-transverse motion was 3°.
Studies on Sacroiliac Joint Motion Coupled with Hip Joint Motion

- Smidt, in 1997, examined sacroiliac joint motion on five aged cadavers. The pelvises were CT-scanned while side lying and the hips were moved where one was fully flexed and the other fully extended (reciprocal stance position).

- Smidt showed in the non-weight bearing position when the hip joint is extended the innominate bone anteriorly tilts and when the hip joint is flexed the innominate bone posteriorly tilts.

Summary of the Evidence of Sacroiliac Joint Motion

- Sacroiliac joint motion does occur.
- Movement is small 2-12 degrees.
- Most studies show that antagonistic innominate motion does occur.
- Sturesson suggests that the symphysis pubis makes the 2 innominate bones rotate as a unit around the sacrum.
- Care must be taken with inferences made from RSA studies that examine sacroiliac joint motion.

Evaluation of the Sacroiliac Joints

- Potter and Rothstein
- Cibulka, Delitto, and Koldehoff
- Freburger and Riddle
- Laslett
- Doppler Studies
- Future studies

- Examined 31 different sacroiliac joint tests.
- Found poor intertester reliability between 8 different experienced orthopaedic PT's.
- Reliability was poor; 11 of the 13 tests resulted in less than 70% agreement.
- Each test was interpreted independent of the other.
- Not at all like a “real” clinical environment.


- Used a cluster of 3 out of 4 sacroiliac joint tests.
- Used 2 experienced PT's.
- Found high reliability (Kappa=.88).
- Used a clinical and iterative approach when making the diagnosis of sacroiliac joint dysfunction.


- Examined SIJ test using Cibulka format.
- Thirty-four therapists from 11 outpatient centers examined 65 patients were used in this study.
- They found poor reliability.
- A problem was their classification of SUD was not clear as to how patients were classified into diagnostic groups.
- Also, most of the PT's were recently trained, by reading a manual, in using this method.

Laslett examined the reliability of some of the provocation tests and found 5 of 7 show good inter-examiner reliability, these include the distraction test (.69 Kappa), compression (.77 Kappa), thigh thrust (.82 Kappa), and left and right pelvic torsion test (.79 and .64 Kappa).

The cranial shear and sacral thrust test both had Kappa values below .35 which is only Fair agreement

Problem with these tests they really don’t guide intervention.

Thus, the tests may be “good” at detecting if SIJ dysfunction is present or not, but that is all they do!


The Doppler method uses ultrasound to measure laxity of the sacroiliac joint through vibration.

Subjects usually lie prone while vibrations are applied unilaterally to the anterior superior iliac spine.

Vibrations are generated by a vibrator and are propagated through the ilium through the sacroiliac joint to the sacrum.

The intensity of vibrations are measured successively on both sides of the sacroiliac joint.

Using ultrasound to detect SIJD

Differences in threshold levels (measured in threshold units, TU’s).

Usually in a stiff joint, little difference in the amplitude of vibration is found between the left and right sides.

A minimal difference between threshold levels of the sacrum and ilium is usually an indication of a stiff joint (less than 2 TU), while a large difference is indicative of a loose joint (greater than 5 TU).

A left to right difference in sacroiliac joint laxity >or=3 threshold units is considered to indicate asymmetric laxity of the sacroiliac joints.
Using ultrasound to detect SIJD, the Pros and Cons.

- US has been found to be reliable.
- Validity has not yet been shown.
  - Thus one must show validity before accepting this method as evidence for sacroiliac joint dysfunction.
- Like provocation tests, US may help detect, but has not yet helped in guiding treatment.
- More studies, especially validity, are needed!

Diagnosis of Sacroiliac Joint Dysfunction
An Iterative or Recursive Process!

- Repeating routines or steps in a loop to insure a parallel or agreed upon response.
  - For example: Repeating SIJ tests to confirm a left posterior innominate finding.
    - All or most tests should agree if not go back to the "drawing board".
  - Most clinicians use this method!
  - Developing consensus when making a diagnosis.

Sacroiliac Joint Intervention

- Are we mobilizing?
  - Manipulation
  - Mobilization
- Or Stabilizing the Sacroiliac joint?
  - Stabilization
  - Belts or restraining devices
  - Prolotherapy
  - Exercise
Studies on Manipulation

- Cibulka et al: 1986 Showed that a manipulative technique directed at the sacroiliac joint can eliminate pelvic obliquity.
- Delitto et al: 1993 Showed that manipulation combined with exercise resulted in significant improvement in both signs and symptoms in patients with sacroiliac joint dysfunction.
- Childs et al: 2004 Developed a clinical prediction rule to help guide the intervention of patients with low back pain.

Conclusion: The Sacroiliac Joint:

- is a synovial joint.
- is a bicondylar joint where motion of one joint requires obligatory motion of the “other” joint.
- can be detected and diagnosed.
- combining information from the history and physical examination improves diagnosis.
- the sacroiliac joint can be effectively treated.
References


EVALUATION AND MANAGEMENT OF LUMBAR-PELVIC DYSFUNCTIONS IN THE PERFORMING ARTIST

CASE STUDY: MUSCULAR IMBALANCES AND SIJ TREATMENT IN 3-DANCERS

COMBINED SECTIONS MEETING
San Diego, CA
February 1-5, 2006

Presenter: Shaw Bronner PT, PhD, MHS, EdM, OCS; Director of ADAM Center at Long Island University, Brooklyn, NY and Director of Therapy Services at Alvin Ailey, New York, NY.

Description:
According to McGill et al. (2003)\(^1\), the spine is inherently unstable. The lumbar spinal column, devoid of its muscular support, buckles under compressive loading of only 90 N (20 lbs).\(^1\) Clinical instability was defined by White and Punjabi (1990)\(^2\) as the loss of the spine’s ability to maintain its patterns of displacement under physiologic loads, resulting in pain, deformity, or neurological deficit. Segmental instability can be further defined as an increase in the size of the neutral zone with a decrease in the capacity of the stabilizing system of the spine (passive, active, and neural control) to maintain the spinal neutral zones within physiologic limits so there is no pain, deformity, or neurological deficit.\(^3\) Fritz et al (2005)\(^4\) found inter-vertebral motion testing (lack of segmental hypomobility) and lumbar flexion ROM to be predictive of radiographic lumbar instability. In addition, higher Beighton scores (> 2/9) were found in subjects with instability.\(^4\)

The annual incidence of lumbar-pelvic injuries in professional dance companies has been reported to be 12 to 23%.\(^5\)–\(^8\) Dance requires frequent work at extremes of motion.\(^9\) They also frequently display benign joint hypermobility syndrome. An increased odds ratio of 11.0 for benign joint hypermobility syndrome (with a Beighton score of > 4/9) was found in ballet dancers at the Royal Ballet company and school compared to age matched controls.\(^10\)

The extreme motion requirements of dance combined with the ROM flexibility found in dancers may help to explain the high rates of lumbar-pelvic injury found in this population. Dancers frequently believe more motion is ‘better’ which may be directly in opposition to the motion control parameters necessary to control unstable segments. This can make them a particularly challenging patient population.

Three cases are presented of dancers with motion control impairments of the lumbar-pelvic region. Each dancer presented with generalized hypermobility on
vertebral and SIJ motion testing. Each dancer also presented with functional movement dysfunctions in extension.

**Case #1**: ML was a 16 y.o. male dance student taking 15 technique classes/week with additional rehearsals.
- Symptoms: chronic right lower lumbar, buttock, and posterior thigh pain.
- Vertebral testing: no hypomobility.
- Motion control impairment: extension.
- Functional movement dysfunction: Right arabesque and cambré back.
- Beighton score: not completed.

Diagnosis: Right L4-5-S1 segment multidirectional instability, SIJ instability, and piriformis syndrome.

**Case #2**: AP was a 21 y.o. female dance student taking 15 technique classes/week.
- Symptoms: intermittent right buttock pain.
- Vertebral testing: no hypomobility.
- Motion control impairment: extension.
- Functional movement dysfunction: Right arabesque, end range grand battement all directions.
- Beighton score: 7/9.

Diagnosis: Right piriformis syndrome with lumbar and SIJ instability.

**Case #3**: MK was an 18 y.o. female dance student taking 11 technique classes/week with additional rehearsals.
- Symptoms: chronic right LBP.
- Vertebral testing: no hypomobility.
- Motion control impairment: extension and side bending.
- Functional movement dysfunction: Cambré back and Horton laterals.
- Beighton score: 2/9.

Diagnosis: L3-L4-L5 segment multidirectional instability.

*Form closure* is a considered position of stability due to the passive system of joint surfaces and ligaments.$^{11, 12}$ For example, the close-packed position for the SIJ is nutation of the sacrum or posterior rotation of the innominates generally demonstrates *form closure.*$^{13}$ *Force closure* is a dynamic process performed by local musculature (transverses abdominis, internal oblique, lumbar multifidus, diaphragm, pelvic floor, etc) to enhance stiffness and control of the segment. With instability of lumbar segments or SIJ, frequently there are dysfunctions in dynamic *force closure* by the local stabilizers. Additionally, excessive motion (extension) may be visualized at the unstable level. In the case of an unstable SIJ, overuse of the piriformis may reflect an attempt to self stabilize this joint.
Increased piriformis elongation/tension has been suggested by Snijders et al (2006) to contribute to SIJ stability.\textsuperscript{14}

Movies will be used to demonstrate the dance-specific activities that were dysfunctional for these cases, with treatment strategies that were employed. While traditional stabilization programs focus on control of a relatively small ‘neutral’ posture, the challenge in treating these patients is achieving \textit{force closure} at dynamic extremes while meeting aesthetic standards. Technique problems specific to these dance movements will be discussed. Corrections were selected that are acceptable to dance aesthetics but permitted a decrease in stressors to the unstable segment.

Limitations: Due to the time constraints of our student injury clinics, no outcomes measures were used. Treatment closure is frequently not possible, as the students simply do not return if their pain is resolved or the semester is over.

\textbf{Objectives:} At the conclusion of this presentation, participants will be able to:

1. Understand risk factors for lumbar-pelvic motion control impairments in dancers.
2. Describe the objectives for developing force closure in dancer-specific activities.

\textbf{Level:} Multilevel.

\textbf{Content:} The major points in this presentation are:

1. Analysis of the dance-specific activity is key to assisting the dancer with dynamic control of instability.
2. An understanding of the aesthetics of dance technique is helpful in gaining the patient’s trust.
3. The extremes of motion at which many of the dance-specific activities occur make treatment particularly challenging.
4. Dancers frequently believe more motion is ‘better’ which may be directly in opposition to the motion control parameters necessary to control unstable segments.

\textbf{References}


Non-operative Management of Lumbar stress fractures in dancers and figure skaters

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References:

9. Manal T Use of Electrical Stimulation to Supplement Lumbar Stabilization for a Figure Skater Following Lumbar Fusion Orthopedic Physical Therapy Practice Vol 14:2:02 pg 30-32 2002
LUMBAR SPINE STABILIZATION TRAINING IN DANCERS
Leigh A. Roberts, PT, DPT, OCS; LAR Physical Therapy, Ellicott City, MD
COMBINED SECTIONS MEETING
San Diego, CA
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Objectives
1. Review anatomy of lumbar stabilization
2. Review literature on lumbar stabilization
3. Present a case study with dance specific lumbar stabilization exercise progression

Anatomy
• Bergmark 1989:
  – Local Stabilizers (psoas major, transversus abdominis, multifidus, quadratus lumbarum)
  – Global Stabilizers (internal oblique, external oblique, erector spinae, rectus abdominis, lats)
• Panjabi 1992: Spinal Stability
• Snijders, Vleeming, Stoeckart 1993 & Lee 2001
  – Form Closure / Force Closure
Harmony of the Stabilizers

- TA, P. OIL, M must work together to provide segmental stabilization and based on their anatomical position are ideally located to create intersegmental stiffness across multiple planes of motion (Jemmett, 2003)

Core Strengthening and Neuromuscular Training in the Literature

- For stabilization:
  - With laxity in the SI Joint: Richardson 2002

- For prevention:
  - LBP: Nadler et al, 2002
  - Knee Injury: Hewett et al, 1999

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Core Strengthening and Neuromuscular Training in the Literature

- For treatment
  – LBP: O’Sullivan, 1997
  – Motor control: Jull, 2000

Basic Concepts of Lumbar Stabilization Exercises*

- SPINE: Neutral spine => Out of neutral
- MUSCLE: Awareness of correct muscle activation
- PROGRESSION
- PLANES
- FUNCTIONAL

Lack of consensus on what constitutes a core-strengthening program

* Akuthota, 2004

Case Study #1

- 23 year old female professional dancer
- Chief complaint: low back pain / tailbone pain and muscle “seizing”
- Insidious onset during Nutcracker season
- 11-25-04 – woke up with pain, unable to WB on R
- Stopped dancing 12-5-04

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Medical History

- X-ray: Spondylolisthesis
- MRI: Minor disk bulge at L5-S1
- PMH: Asthma, LBP Fall 2004, {R} Ankle Pain
- Patient Goals:
  1. “Get better”
  2. “Resume dancing”
  3. “Be more efficient”

Physical therapy findings:
January 10, 2005

- Posture: Thoracic sway back, forward head and rounded shoulders, muscular banding in lower lumbar
- Palpation: Maximum pain on sacrum; moderate on sacral multifidus, (R) QL, (R) piriformis
- Joint Mobility: Hypomobility of sacrum, thoracic spine; normal lumbar, sacroiliac joint
- ROM: Forward flexion limited 75%
- Special Tests: {-} SLR, slump test, sensory testing, and spondylolisthesis perturbation

Treatment #1: January 11, 2005

- Clinical Hypothesis: Sacral rigidity and piriformis / iliacus muscle spasm
- Functional Goal:
  - painfree 1st position,
  - painfree weight transfer onto R
  - painfree parallel to turnout coupe on R
- Manual therapy: joint mobilizations
- Exercise:
  - Increase Lumbar Flexion
  - Re-educate Hip External Rotation
- Function:
  - Taking barre only
  - No score for DFOS or SF-36

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Core Strength: Multifidus Beginner

(SMPPF)

Core Strength: Sidebridging Beginner

(SMPPF)

Standing Leg Turnout Re-education: Beginner

(SMPPF)

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Gesture Leg  
Re-education: Beginner

Treatment # 10: February 10, 2005

• Clinical Hypothesis: Incomplete motor learning of new turnout pattern contributing to muscle spasm and compensations
• Functional Goal: Competent turnout supine and standing parallel to first using pelvic floor

• Manual Techniques:  
  – Less frequency and duration
• Exercise:  
  – Re-education continued
• Function:  
  – Return to full class; not able to perform fast combinations

Core Strength:  
Multifidus Intermediate

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Core Strength:
Sidebridging Intermediate

(SMPPF)

Standing Leg Turnout
Re-education - Intermediate

(SMPPF)

Gesture Leg
Re-education - Intermediate

(SMPPF)
Standing / Gesture Leg
Re-education - Intermediate

(SMPPF)

Treatment # 19: March 31, 2005

• Clinical Hypothesis: positional fault of coccyx likely to be increasing muscle tone t/o (R) sacral/hip area
• Functional Goal: painfree, unobstructed full external rotation of (R) hip

• Manual techniques:
  – As needed for lumbar, sacrum, coccyx, hip
• Exercise:
  – Footprints, single leg work
• Function:
  – DFOS Objective: 82%
  – DFOS Subjective: 75%
  – SF36 Physical: %
  – SF36 Mental: %

Core Strength:
Multifidus Advanced

(SMPPF)
Core Strength: Sidebridging Advanced

Standing Leg Turnout Re-education: Advanced

Gesture Leg Re-education: Advanced

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Standing / Gesture Leg
Re-education - Advanced

(SMPPF)

Treatment # 21: May 5, 2005

- Patient is discharged;
  she has met all of her
goals and has returned
to full dance
- Manual techniques:
  - As needed for
    lumbar, sacrum,
coccyx, hip
- Exercise:
  - Dance integration
- Function:
  - Full dance
  activities

3-Month follow-up:
September 6, 2005

- DFOS Objective: 92%
- DFOS Subjective: 98%
- SF36 Physical: 42%
- SF36 Mental: 60%
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- Shaw Bronner, PT, PhD, MHS, EdM, OCS

References


References (Con’t)

References (Con’t)


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