

**THE HESCH METHOD OF TREATING
SACROILIAC JOINT DYSFUNCTION:
INTEGRATING THE SI, SYMPHYSIS PUBIS,
PELVIS, HIP AND LUMBAR SPINE**

BASIC AND INTERMEDIATE WORKBOOK



**Jerry Hesch, MHS, P.T.
Hesch Institute
1609 Silver Slipper Avenue
Henderson, NV 89002-9334 USA
Phone 702-558-6011 Office (PST), Cell 702-561-0143
E-mail: HeschInstitute@Yahoo.com
<http://www.HeschInstitute.com>**

1985, ©1992, Latest Revision June 21, 2011

All rights reserved. This workbook is protected by copyright. No part of this workbook may be reproduced in any form or by any means, including photocopying, or utilized by any information storage and retrieval system, for distribution; without written permission from the copyright owner. *Please do Xerox handouts for your patients from this workbook, this is the intended purpose.* I simple wish to protect my ownership, in other words I do not want someone selling this work or teaching it without my authorization.

HESCH METHOD WORKBOOK BIBLIOGRAPHY

ANATOMY

Anderson J. *Grant's Atlas of Anatomy*. 7th ed. Baltimore, MD: Williams & Wilkins; 1978.

Bechtel R. Physical Characteristics of the Axial Interosseous Ligament of the Human Sacroiliac Joint. *Spine*. 2001 Jul-Aug;1(4):255-9.

Bowen V, Cassidy D. Macroscopic and Microscopic Anatomy of the Sacroiliac Joint From Embryonic Life Until the Eighth Decade. *Spine*. 1980;6:620-628.

Brunner C, Kissing R, Jacob H. The Effects of Morphology and Histopathologic Findings on the Mobility of the Sacroiliac Joint. *Spine*. 1991;16:1111-1117.

Fryette H. *Principles of Osteopathic Technic*. Carmel, CA: Academy of Applied Osteopathy; 1966.

Goss CM. *Gray's Anatomy*. Philadelphia, PA: WB Saunders Co; 1973.

Hollingshead WH. *Textbook of Anatomy*. 3rd ed. New York, NY: Harper & Row; 1974.

Lamb D. The neurology of spinal pain. In *APTA Focus on the Low Back*. Washington, DC: The Am Phys Ther Assoc; 1979.

Romanes GJ (Ed). *Cunningham's Textbook of Anatomy*. 12th ed. New York, NY: Oxford Press; 1981:212,213, 242-244.

Sakamoto N, Yamahita T, Takebayashi T, et al. An Electrophysiologic Study of Mechanoreceptors in the Sacroiliac Joint and Adjacent Tissues. *Spine*. 2001 Oct 15;26(20):E468-71.

Sashin D. A Critical Analysis of the Anatomy and the Pathological Changes of the Sacroiliac Joints. *J Bone Jt Surg*. 1930;xii:891-910.

Solonen KA. The Sacroiliac Joint in the Light of Anatomical, Roentgenological and Clinical Studies. *Acta Ortho Scand*. 1957;1(suppl):27.

Szadek KM, Hoogland PV, Zuurmond WW, de Lange JJ, Perez RS. Nociceptive nerve fibers in the sacroiliac joint in humans. *Reg Anesth Pain Med*. 2009 Jan-Feb;33(1):36-43.

Vleeming A, Stoeckart R, Snijders CJ. The Sacrotuberous Ligament: A Conceptual Approach to its Dynamic Role in Stabilizing the Sacroiliac Joint. *Clin Biomech*. 1989;4:201-203.

Vleeming A. *The Sacroiliac Joint: A Clinical-Anatomical, Biomechanical and radiological Study*. A. Vleeming: Rotterdam, the Netherlands; 1990.

Vleeming A, Stoeckart R, Volkers A. et al. Relation Between Form and Function in the Sacroiliac joint. Part I: Clinical Anatomical Aspects. *Spine*. 1990;15:130-132.

Walker J. Age-Related Differences in the Human Sacroiliac Joint: A Histological Study; Implications for Therapy. *J Ortho Sports Phys Ther*. 1986;7:325-334.

Warwick R; Williams P, ed. *Gray's Anatomy*. 35th ed. Philadelphia, Pa: WB Saunders; 1973:388-392, 442-446.

Weisl H. The Ligaments of the Sacroiliac Joint Examined With Particular Reference to Their Function. *Acta Anat*. 1954;20:202-213.

Wilder DG, Pope MH, Frymoyer JW. The Functional Topography of the Sacroiliac Joint. *Spine*. 1980;5:575-579.

Wyke B.D. Articular Neurology: A Review. *Physiotherapy*. 1972;58:94.

MOVEMENT AND RADIOLOGY

Chamberlin E. The Symphysis Pubis in the Roentgen Examination of the Sacroiliac Joint. *Amer J Roent*. 1930;24:621-625.

Chamberlin WE. The X-Ray Examination of the Sacroiliac Joint. *Delaware Med J* 1932;4:195-201.

Colachis S, Worden R, Bechtol C, et al. Movement in the Sacroiliac Joint in the Adult Male: A Preliminary Report. *Arch Phys Med Rehab*. 1963;44:490-498.

Damen L, Spoor CW, Snijders CJ, Stam HJ. Does a Pelvic Belt Influence Sacroiliac Joint Laxity? *Clin Biomech (Bristol, Avon)*. 2002 Aug; 17(7):495-8.

Davis P, Lentle B. Evidence for Sacroiliac Disease as a Common Cause of Low Backache in Women. *The Lancet*. Sept 2, 1978:496-497.

Death AB, Kirby RL, Macmillan CL. Pelvic Ring Mobility: Assessment by Stress Radiography. *Arch Phys Med Rehabil*. 1982;63:204-206.

Demir M, Mavi A, Gümüşburun E, Bayram M, Gürsoy S, Nishio H. Anatomical Variations with Joint Space Measurements on CT. *Kobe J Med Sci*. 2007;53(5):209-17.

Dihlmann W. *Diagnostic Radiology of the Sacroiliac Joints*. London: Yearbook Medical Publishers; 1980.

- Egund N, Olsson TH, Schmid H, et al. Movements in the Sacroiliac Joints Demonstrated With Roentgen Stereophotogrammetry. *Acta Radiol Diagnosis*. 1978;19:833-846.
- Freeman M, Fox D, Richards T. The Superior Intracapsular Ligament of the Sacroiliac joint; Presumptive Evidence for Confirmation of Illi's Ligament. *J Manip Phys Ther*. 1990;13:384-390.
- Frigero N, Stowe R, Howe J. Movement of the Sacroiliac Joint. *Clin Ortho and Rel Research*. 1974;100:370-377.
- Gamble J, Simmons S, Freedman M. The Symphysis Pubis. *Clin Ortho Rel Research*. 1986;203:261-272.
- Hanson P, Angevine M, Juhl J. Osteitis Pubis in Sports Activities. *Phys Sports Med*. Oct 1978;111-114.
- Hermann KG, Halle H, Reissbauer A, Schink T, Vsianska L, Mühler MR, Lembcke A, Hamm B, Bollow M. Peripartum changes of the pelvic ring: usefulness of magnetic resonance imaging. *Rofa*. 2007 Dec 179(12):1243-50. Epub 2007 Oct 10.
- Jung JH, Kim HI, Shin DA, Shin DG, Lee JO, Kim HJ, Chung JH. Usefulness of pain distribution pattern assessment in decision-making for the patients with lumbar zygapophyseal and sacroiliac joint arthropathy. *J Korean Med Sci*. 2007 Dec;22(6):1048-54.
- Kapandji IA. The Physiology of the joints: The Trunk and Vertebral Column. Vol 3. London: Churchill Livingstone; 1974.
- Kissling RO, Jacob HA. The Mobility of the Sacroiliac Joint in Healthy Subjects. *Bull Hosp Jt Dis*. 1996;54(3):158-64.
- Lavignole B, Vital JM, Senegas C, et al. An Approach to the Functional Anatomy of the Sacroiliac Joints in Vivo. *Anat Clinic* 1983;5:169-176.
- Lawson T, Foley W, Carrera G, et al. The Sacroiliac Joints: Anatomic, Plain Roentgenographic, and Computed Tomographic Analysis. *J Comput Assist Tomogr*. 1982;6:307-314.
- Lund PJ, Krupinski EA, Brooks WJ. Ultrasound Evaluation of Sacroiliac Motion in Normal Volunteers. *Acad Radiol*. 1996 Mar;3(3):192-6.
- Malghem J, Vande Berg B, Lecouvet F, Koutassisoff S, Maldague B. Principles of analysis for sacroiliac joints imaging. *JBR-BTR* 2007 Sep-Oct;90(5):358-67.
- McGill SM. A Biomechanical Perspective of Sacroiliac Pain. *Clinic Biomech*. 1987;2:145-151.
- Miller JAA, Schultz AB, Anderson GBJ. Load Displacement Behavior of Sacroiliac Joints. *J Orthop Res*. 1987;5:92-101.

Okuda T; Fujita T; Kaneuji A; et al. Stage-specific Sagittal Spinopelvic Alignment Changes in Osteoarthritis of the Hip Secondary to Developmental Hip Dysplasia. *Spine*. 32(26):E816-E819, Dec 15, 2007

Onsel C, Collier BD, Kir KM, et al. Increased Sacroiliac Joint Uptake after Lumbar Fusion and/or Laminectomy. *Clin Nuc Med*. 1992;17:283-287.

Pel JJ, Spoor CW, Pool-Goudzwaard AL, Hoek van Dijke GA, Snijders CJ. Biomechanical analysis of reducing sacroiliac joint shear load by optimization of pelvic muscle and ligament forces. *Ann Biomed Eng*. 2009 Mar;36(3):415-24. Epub 2009 Jan 18.

Pierrynowski MR, Schroeder BC, Garrity CB, et al. Three-Dimensional Sacroiliac Motion During Locomotion in Asymptomatic Male and Female Subjects. Presented at the Fifth Conference of the Canadian Society of Biomechanics; August 1988; Ottawa, Ontario-Canada.

Pitkin H, Pheasant H. Sacroarthrogenetic Telalgia: A Study of Sacral Mobility. *J Bone Jt Surg*. 1936;XVII 365-374.

Pool-Goudzwaard A, van Dijke GH, van Gurp M, Mulder P, Snijders C, Stoeckart R. Contribution of Pelvic Floor Muscles to Stiffness of the Pelvic Ring. *Clin Biomech (Bristol, Avon)*. 2004 Jul;19(6):564-71.

Reynolds H. Three Dimensional Kinematics in the Pelvic Girdle. *JAOA*. 1980;80:277-280.

Rold J, Rold BA. Pubic Stress Symphsitis in a Female Distance Runner. *Phys Sports Med*. 1986;14:61-65.

Rothkotter HJ, Berner W. Failure Load and Displacement of the Human Sacroiliac Joint Under in Vitro Loading. *Orthop Trauma Surg*. 1988;107:283-287.

Scholten PJM, Schultz AB, Luchies CW, et al. Motions and Loads Within the Human Pelvis: A Biomechanical Study. *J Orthop Res*. 1988;6:840-850.

Schnute W. Osteitis Pubis. *Clin Ortho*. 1961;20:187-192.

Smidt GL, McQuade K, Wei SH, Barakatt E. Sacroiliac Kinematics for Reciprocal Straddle Positions. *Spine* 1995 May1;20(9):1047-54.

Solonen KA. The Sacroiliac Joint in Light of Anatomical, Roentgeological and Clinical Studies. *Acta Ortho Scand*. 1957;27(suppl):1-14.

Stevens A. Side Bending and Axial Rotation of the Sacrum Inside the Pelvic Girdle. Published in the proceedings from The First Interdisciplinary World Congress on Low Back Pain and Its Relation to the Sacroiliac Joint; November 6, 1992; San Diego, CA.

Sturesson B, Selvik G, Uden A. Movements of the Sacroiliac Joints: A Roentgen Stereophotogrammetric Analysis. *Spine*. 1989;14:162-165.

Sturesson B, Uden A, Vleeming A. A radiostereometric analysis of movements of the sacroiliac joints during the standing hip flexion test. *Spine*. 2000 Feb 1;25(3):364-8.

Tullberg T, Blomberg S, Branth B, Johnsson R. Manipulation does not alter the position of the sacroiliac joint. A roentgen stereophotogrammetric analysis. *Spine*. 1998 May 15;23(10):1124-8; discussion 1129.

Van Wingerden JP, Vleeming A, Buyruk HM, Paissadat K. Stabilization of the Sacroiliac Joint in Vivo: Verification of Muscular Contribution to Force Closure of the Pelvis. *Eur Spine J*. 2004 May;13(3):199-205.

Vix VA, Ryu CY. Adult Symphysis Pubis: Normal and Abnormal. *Am J Roentgen Radium Ther Nuc Med*. 1977;112:517-525

Vleeming A, Van Wingerden JP, Snijders CJ et al. Load Application to the Sacrotuberous Ligament: Influences on Sacroiliac Joint Mechanics. *Clin Biomechanics*. 1989;4:204-209.

Walheim G, Olerud S, Ribbee T. Mobility of the Pubic Symphysis. *Acta Ortho Scand*. 1984;55:203-208.

Weisl H. The Articular Surface of the Sacroiliac Joint and Their Relation to the Movements of the Sacrum. *Acta Anat*. 1954;22:1-14.

Weisl H. The Movements of the Sacroiliac Joint. *Acta Anat*. 1955;23:80-91.

Yagan R, Khan M, Marmolya G. Role of Abdominal CT, When Available in Patients Records, in the Evaluation of Degenerative Changes of the Sacroiliac Joints. *Spine*. 1987;12:1046-1051.

INSTABILITY OF THE SACROILIAC AND SYMPHYSIS PUBIS

Bickel WH, Romaness J. True Diastasis of the Sacroiliac Joints with Hypermobility. *J Bone Jt Surg*. 1957;39A:1381-1384.

Coventry M, Tapper E. Pelvic Instability: A Consequence of Removing Iliac Bone for Grafting. *J Bone Jt Surg*. 1972;54A:96-101.

Hagen R. Pelvic Girdle Relaxation From an Orthopedic View. *Acta Ortho Scand*. 1972;45:550-563.

Laban MM, Meerschaert JR. Lumbosacral-Anterior Pelvic Pain Associated With Pubic Symphysis Instability. *Arch Phys Med Rehab*. 1975;56:48.

Macnab I. *Backache*. Baltimore, Md: Williams & Wilkins; 1981:64-78, 217-218.

McGregor M, Cassidy DC. Postsurgical Sacroiliac Joint Syndrome. *J Manip Physiol Ther*. 1983;6:1-12.

Walheim G. Pelvic Instability After Fracture and Parturition. *Acta Ortho Scand*. 1979;50:362.

Zimmermann T, Patzak HJ, Kelm C, et al. Treatment of Ruptures of the Symphysis and Iliosacral Joint in Pediatric Patients. *Eur J Pediatr Surg*. 1992;2:348-351.

Young. Relaxation of the Pelvic Joints in Pregnancy. *J Ob Gyn Brit Emp*. 1940;47:493-525.

OBSTETRICS AND THE SACROILIAC

Barral JP, The Coccyx. In: Mercier P. *Visceral Manipulation*. Seattle: Eastland Press; 1988:255-263.

Bookhout M, Boissonault W. Physical Therapy Management of Musculoskeletal Disorders During Pregnancy. In: Wilder E, ed. *Obstetric and Gynecologic Physical Therapy*. NY: Churchill Livingstone; 1988:17-62.

Browning J: Chiropractic Distractive Decompression in Treating Pelvic Pain and Multiple System Pelvic Organic Dysfunction. *J Manip Phys Ther*. 1989;12:265-274.

Browning J: Mechanically Induced Pelvic Pain and Organic Dysfunction in a Patient Without Low Back Pain. *J Manip Physiol Ther*. 1990;13:406-411.

Colachis SC, Worden RE, Bechtol CO, et al. Movement of the Sacroiliac Joint in the Adult Male: A Preliminary Report. *Arch Phys Med Rehab*. Sept. 1963;44:490-98.

Calguneri M, Bird HA, Wright V. Changes in Joint Laxity Occurring During Pregnancy. *Ann Rheum Dis*. 1982;41:126-128.

Davis P, Lentle B. Evidence for Sacroiliac Disease as a Common Cause of Low Backache in Women. *The Lancet*. Sept 2, 1978:496-497.

Depledge J, McNair PJ, Keal-Smith C, Williams M. Management of Symphysis Pubis Dysfunction During Pregnancy Using Exercise and Pelvic Support Belts. *Physical Therapy* 2005, 85:1290+

Eichner E, Waltner C, Goodman M, et al. Relaxin; A Third Ovarian Hormone: its Experimental Use in Women. *Am J Obstet Gynec*. May 1956;71:1035-1048.

Epstein JA. (Moderator) Treatment of Low Back Pain and Sciatic Syndromes During Pregnancy, a Symposium. *NY State J of Med.* May 1, 1959:1757-1768.

Farbot E. The Relationship of the Effect and Pain of Pregnancy to the Anatomy of the Pelvis. *Acta Radiol.* 1952;38:403-419.

Fast A, Shapiro D, Ducommun E, et al. Low Back Pain in Pregnancy. *Spine* 1987;12:368-371.

Golightly R. Pelvic Arthropathy in Pregnancy and Puerperium. *Physiother.* 1982;68:216-220.

Grose A. Pelvic Ring Instability During Pregnancy. (Unpublished Material January, 1986).

Hagen R. Pelvic Girdle Relaxation From an Orthopedic View. *Acta Ortho Scand.* 1974;45:550-563.

Herman H. Urogenital Dysfunction. In: Wilder E, ed. *Obstetric and Gynecologic Physical Therapy.* NY: Churchill Livingstone; 1988:83-112.

Joseph J. The Joints of the Pelvis and Their Relation to Posture in Labor. *Midwives Chronicle & Nursing Notes.* March 1988:63-64.

Laban MM, Meerschaert JR. Lumbosacral-Anterior Pelvic Pain With Pubic Symphysis Instability. *Arch Phys Med Rehab.* 1975;56:48.

Lynch FW. The Pelvic Articulations During Pregnancy, Labor and Puerperium: an X-ray Study. *Surg Gynec Obstet.* 1920;30:575-580.

MacLellan A. The Role of Relaxin in Human Reproduction. *Clin Repro Fertil.* 1983;2:77.

MacLellan A. The Role of the Hormone Relaxin in Human Reproduction and Pelvic Girdle Relaxation. *Scan J Rheumatol.* 1991;20(suppl 88):7-15.

Painter EE, Ogle MD, Teyhen DS. Lumbopelvic dysfunction and stress urinary incontinence: a case report applying rehabilitative ultrasound imaging. *J Orthop Sports Phys Ther.* 2007 Aug;37(8):499-504.

Quagliarello J, Steinetz BG, Weiss G. Relaxin Secretion in Early Pregnancy. *Ob Gyn.* 1979;53:62-63.

Sands R. Backache of Pregnancy. *Obstet and Gynec.* 1958;12:670-676.

Sicuranza B, Richards J, Tisdall L. The Short Leg Syndrome in Obstetrics and Gynecology. *Am J Obstet Gynec.* 1970;107:217-219.

Svensson HS, Andresson GBJ, Hagstad A, et al. The Relationship of Low-Back Pain to Pregnancy and Gynecologic Factors. *Spine.* 1990;15:371-375.

Thorn GW. Harrison's Principles of Internal Medicine. 8th Ed. NY:Mcgraw Hill; 1977

Walheim G. Pelvic Instability After Fracture and Parturition. *Acta Ortho Scand.* 1979;50:362.

Weiss G, O'Byrne EM, Steinetz BG. Relaxin: A Product of the Human Corpus Luteum of Pregnancy. *Science.* Nov 26, 1976;194:948-949.

Young L. Relaxation of the Pelvic Joints in Pregnancy. *J Ob Gyn Brit Empire.* 1940;47:493-525.

RESEARCH

Alviso D, Dong G, Lentell G. Intertester Reliability for Measuring Pelvic Tilt in Standing. *Phys Ther.* 1988;68:1347-1351.

Bemis T, Daniel M. Validation of the Long Sitting Test on Subjects With Iliosacral Dysfunction. *J Ortho Sports Phys Ther.* 1987;8:336-345.

Carmichael JP. Inter and Intra-Examiner Reliability of Palpation for Sacroiliac Joint Dysfunction. *J Manip Physiol Ther.* 1987;10:164-171.

Cassidy JD, Kirkaldy-Willis WH, McGregor M. Spinal Manipulation for the Treatment of Chronic Low Back and Leg Pain: An Observational Trial. In: Buerger AA, Greenman PE, eds. *Empirical Approaches to the Validation of Manipulative Therapy.* Springfield, Illinois: Charles C Thomas; 1985.

Cibulka M, Rose S, Delitto A, et al. Hamstring Muscle Strain Treated by Mobilizing the SI Joint. *Phys Ther.* 1986;66:1220-1223.

Cibulka M, Threslkeld-Watkins J. Patellofemoral Pain and Asymmetrical Hip Rotation. *Physical Therapy* 2005, 85:1201+

Cummings G, Crowell R. Source of Error in Assessment of Innominate Position. A Special Communication. *Phys Ther.* 1988;68:77-78.

Ellis T, Moore T, Jackson R, et al. Palpation to Assess Iliac Symmetry/Asymmetry; Isometric Mobilization to Restore Iliac Symmetry. *Orthopaedic Practice.* 1990;2:31-32. Abstract.

Huijbregts P. Sacroiliac Joint Dysfunction: Evidence-based Diagnosis. Feature Article of the Orthopedic Division of the Canadian Physical Therapy Association. May/June 2004.

Keating J, Matyas TA, Bach TM. The Effect on training on Physical Therapist's Ability to Apply Specific Forces of Palpation. *Phys Ther.* 1993;73:38-46.

Levangie P, Bates A, Drips A, et al. Three tests of Sacroiliac Joint Dysfunction in Subjects With and Without Low-Back Pain. Paper presented at the National Conference APTA, Anaheim, California. June 1990.

Lipetz N, White S. Determination of Confidence Intervals for Detecting Rotational Asymmetry of the Pelvis. Unpublished study, 1990.

Mann M, Glasheen-Wray M, Nyberg R. Therapist Agreement for Palpation and Observation of Iliac Crest Heights. *Phys Ther.* 1984;64:334-338.

Marshall P, Murphy B. The Effect of Sacroiliac Joint Manipulation on Feed-forward Activation Times of the Deep Abdominal Musculature. *J Manipulative Physiol Ther.* 2006 Mar-Apr; 29(3):196-202.

Olson L. Effects from the Hesch Method Pelvic Mobilization on Lumbar flexion, Straight Leg Raise Performance, and Standing Pelvic Inclination Angles in Patients With Low Back Pain. Chicago, Il: Finch University of Health Sciences/The Chicago Medical School; 1998, Thesis.

O'Sullivan PB, Beales DJ, Beetham JA, Cripps J, Graf F, Lin IB, Tucker B, Avery A. Altered Motor Control Strategies in Subjects with Sacroiliac Joint Pain During Active Straight-leg-raise Test. *Spine* 2002 Jan 1;27(1):E1-8

Potter N, Rothstein J. Intertester Reliability for Selected Tests of the Sacroiliac Joint. *Phys Ther.* 1985;65:1671-1677.

Smith R, Sebastian B, Gajdosik R. Effect of Sacroiliac Mobilization on the Standing Position of the Pelvis in Healthy Men. *J Ortho Sports Phys Ther.* 1988;10:77-84.

Stuber KJ. Specificity, sensitivity, and predictive values of clinical tests of the sacroiliac joint: a systematic review of the literature. *JCCA J Can Chiropr Assoc.* 2007 Mar; 51(1):30-41.

*The following Kraemer projects utilized the Hesch method of Evaluation and Treatment, even those in which "Hesch Method" is not specifically named in the title.

*Kraemer TJ. Hamstring Length, Lumbar Spinal Range of Motion, Pelvic Tilt, Pelvic Mobility, & Low Back Pain Among Racially Diverse Employees. World Confederation of Physical Therapy: Vancouver, BC. June 5, 2007.

*Olsen L, Kraemer TJ. Establishing the reliability of the Hesch Method™ spring and positional tests in patients with low back pain. World Confederation of Physical Therapy: Barcelona, Spain; June 8, 2003.

*Kraemer TJ. Sacroiliac Joint Dysfunction in Acute Low Back Pain Patients. American Pain Society; November 11, 1995.

*Kraemer TJ. Radiological Assessment of the SI Joint in Low Back Pain Patients. American Pain Society; November 11, 1995.

*Kraemer TJ. Use of McConnell Taping for SI Joint Dysfunction. American Pain Society; November 11, 1995.

*Kraemer, T & Heather Gamble. Hamstring length, lumbar spinal range, pelvic mobility, & low back pain in male power lifters: A pilot study. ATSU. 2007

*Establishing the reliability of the Hesch Method™ spring and positional tests in patients with low back pain. USF Grant. Funded. \$2,500. Principal Investigator. 2003-2004

*Lumbopelvic Mobility & Back Pain among Certified Nursing Assistants. Sunshine ERC. USF Grant. Funded. \$14,964. Principal Investigator. 2002-2003

*Factors associated with Low Back Pain among Racially Diverse University Employees. Institute of Black Life. USF Grant. Funded. \$4,000. Principal Investigator. 2002-2003

*Work Related Factors and Back Pain in Certified Nursing Assistants. Sunshine ERC. USF Grant. Funded. \$15,724. Principal Investigator. 2001-2002

*Effect Of Exercise On Lumbopelvic Motion. Touro University Nevada. 2008-2009

*Lumbopelvic Mobility as an Indicator of Low Back Pain and Hamstring Injuries in Collegiate Runners. National Athletic Trainers™ Association. Principal Investigator. 2007

*Hamstring length, lumbar spinal range, pelvic mobility, & low back pain in male power lifters: A pilot study. National Strength & Conditioning Association. Funding Initially Approved. Co-Investigator. 2006-2007

*Lumbopelvic Mobility as an Indicator of Low Back Pain and Hamstring Injuries in Collegiate Runners. National Athletic Trainers™ Association. Not Funded - Invitation for Complete Proposal by March 2007. Principal Investigator. 2006-2007

GENERAL SACROILIAC AND MANUAL THERAPY REFERENCES

- Alderink G. The Sacroiliac Joint: Review of Anatomy, Mechanics and Function. *JOSPT*. 1991;13:71-84.
- Beal MC. The Sacroiliac Problem: Review of Anatomy, Mechanics and Diagnosis. *JAOA*. 1982;81:73-85.
- Bellamy N, Park W, Rooney PJ. What Do We Know About the Sacroiliac Joint? *Seminars in Arthritis Rheum*. 1983;12:282-313.
- Bernard T. Sacroiliac Joint Injection. Presented at the First Interdisciplinary World Congress on Low Back Pain and Its Relation to the Sacroiliac Joint. November 5, 1992; San Diego, CA.
- Breig A. Adverse Mechanical Tension in The Central Nervous System. Stockholm, Sweden: Almquist and Wiskell; 1972.
- Buijs E, Visser L, Groen G. Sciatica and the sacroiliac joint: a forgotten concept. *Br J Anaesth*. 2007 Nov;99(5):713-6. Epub 2007 Sep 14.
- Chaitow L. *Palpatory Literacy*. London: Thorsons; 1991;116, 123.
- Cibulka M, Koldehoff R. Evaluation of Chronic Sacroiliac Dysfunction. *Clinical Mgmt in Phys Ther*. 1986;6:12-15.
- Cibulka M, Rose S, Delitto A, et al. Hamstring Muscle Strain Treated by Mobilizing the Sacroiliac Joint. *Phys Ther*. 1986;66:1220-1223.
- Cyriax J. *Textbook of Orthopedic Medicine: Diagnosis of Soft Tissue Lesions*. 7th. London:Bailliere Tindall; 1978:575-577.
- Dreyfuss P, Dreyer SJ, Cole A, Mayo K. Sacroiliac Joint Pain. *J Am Acad Orthop Surg*. 2004 Jul-Aug;12(4):255-65.
- DonTigny R. Anterior Dysfunction of the Sacroiliac Joint as a Major Factor in the Etiology of Idiopathic Low Back Pain Syndrome. *Phys Ther*. 1990;70:250-262.
- DonTigny R. Dysfunction of the Sacroiliac Joint and its Treatment. *JOSPT*. 1979;1:23-35.
- DonTigny R. Function and Pathomechanics of the Sacroiliac Joint. *Phys Ther*. 1985;65:35-44.
- Erhard R, Bowling R. The Recognition and Management of the Pelvic Components of Low Back and Sciatica Pain. *Bull Ortho Section APTA*. 1978;2:4-14.
- Foley BS, Buschbacher RM. Sacroiliac joint pain: anatomy, biomechanics, diagnosis, and treatment. *Am J Phys Med Rehabil*. 2006 Dec;5(12):997-1006.

Letter to editor and reply, *Am J Phys Med Rehabil.* 2007 Dec;86(12):1032-3; author reply 1033

Goldwait JE. *Essentials of Body Mechanics.* London: Lippincott; 1952.

Greenman PE. *Principles of Manual Medicine.* Baltimore, MD: Williams & Wilkins; 1989:225-270.

Grieve G. The Sacroiliac Joint. *Physiotherapy.* 1976;62:384-400.

Grieve G. *Modern Manual Therapy of the Vertebral Column.* NY: Churchill Livingstone; 1986.

Hesch J. Manual Therapy for the Sternum. *Phys Ther Today.* 1989 Fall Issue 56-58.

Hesch J, Aisenbrey J, Guarino J. The Pitfalls Associated With Traditional Evaluation of Sacroiliac Dysfunction and Their Proposed Solution. Presented at Annual Conference of the American Physical Therapy Association, Anaheim, Ca June 25, 1990.

Hesch J. Manual Therapy Evaluation of the Pelvic Joints using Palpatory and Articular Spring Tests. Presented at the First Interdisciplinary World Congress on Low Back Pain and Its Relation to the Sacroiliac Joint; November 6, 1992; San Diego, CA.

Hesch J. The Hesch Method of Treating Sacroiliac Joint Dysfunction: An Integrated approach Advanced Workbook. Albuquerque: 1996

Hesch J. Evaluating Sacroiliac Joint Play with Spring Tests. *J ObGyn PT.* 1996;20:3 4-7.

Hesch J. Evaluation and Treatment of the Most Common Pattern of Sacroiliac Joint Dysfunction. In: *Movement, Stability & Low Back Pain: The Essential Role of the Pelvis.* Vleeming A, Mooney V, Dorman T, Snijders C, Stoeckart R, eds. London:Churchill Livingstone 1997: chap. 42.

Hesch J. Sacral Torsions About An Oblique Axis: A New Approach To An Old Problem. Book Chapter in review. June 2011.

Hoyt H, Bard D, Shaffer F. Experience With an Antigravity Leverage Device for Chronic Low Back Pain: A Clinical Study. *JAOA.* March 1981.

Kirkaldy-Willis WH. A More Precise Diagnosis for Low Back Pain. *Spine.* 1979;4:102-109.

Laslett M, Young SB, Aprill CN, McDonald B. Diagnosing Painful Sacroiliac Joints: A Validity Study of a McKenzie Evaluation and Sacroiliac Provocation Tests. *Aust J Physiother.* 2003;49(2):89-97.

Lee D. *The Pelvic Girdle.* NY: Churchill Livingstone; 1989.

Lee D, Walsh M. *A Workbook of Manual Therapy for the Vertebral Column and Pelvic Girdle.* British Columbia: Nacent Publishing; 1985.

Mitchell F, Moran P, Pruzzo N. An Evaluation and Treatment Manual of Osteopathic Muscle Energy Procedures. Valley Park, MO: ICEOP; 1979.

Mitchell F. Structural Pelvic Function. *Academy Applied Osteopathy*, 1958:72-90.

Nyberg R. Pelvic Girdle. In: Payton O, ed. *Manual of Physical Therapy*. New York: Churchill Livingstone; 1989:363-382.

Ongley M, Klein R, Dorman T, et al. A New Approach to the Treatment of Chronic Low Back Pain. *The Lancet*. July 18, 1987:143-146.

Paris S. *Introduction to Evaluation and Manipulation of the Spine*. St. Augustine: Institute of Graduate Physical Therapy; 1991:43, 51.

Porterfield J. The Sacroiliac Joint. In: Davis G, Gould J, eds. *Orthopedics and Sports Physical Therapy*. St Louis: CV Mosby; 1985:550-579.

Porterfield JA, DeRosa C. The Sacroiliac Joint. In: Davis G, Gould J, eds. *Orthopedic and Sports Physical Therapy*. 2nd ed. St Louis: Mosby-Yearbook; 1990:553-574.

Porterfield J, DeRosa C. Mechanical Low Back Pain: Perspectives in Functional Anatomy. Philadelphia: W.B. Saunders; 1991.

Richard R. *Osteopathic Lesions of the Sacrum*. NY: Thorsons Publ Co; 1986

Stoddard A. *Manual of Osteopathic Technique*. London: Hutchison Publ; 1980.

Travell J, Simons D. *Myofascial Pain and Dysfunction: The Trigger Point Manual*. Baltimore, MD: Williams & Wilkins; 1983.

Vleeming A, Snijders CJ, Stoeckart R. Progress in Vertebral Column Research, First International Symposium on The Sacroiliac Joint: Its Role in Posture and Locomotion; April 27, 1991; Maastricht, The Netherlands.

Walker ML, Rothstein JM, Finucane SD, et al. Relationships Between Lumbar Lordosis, Pelvic Tilt, and Abdominal Muscle Performance. *Phys Ther*. 1987;67:512-516.

Walker JM: The Sacroiliac Joint. A Critical Review. *Phys Ther*. 1992;72:903-916.

Weksler N, Velan GJ, Semionov M, Gurevitch B, Klein M, Rozentsveig V, Rudich T. The role of sacroiliac joint dysfunction in the genesis of low back pain: the obvious is not always right. *Arch Orthop Trauma Surg*. 2007 Dec;127(10):885-8. Epub 2007 Sep 8.

Woerman A. Evaluation and Treatment of Dysfunction in the Lumbar-Pelvic-Hip Complex. In: Donatelli R, Wooden M, ed. *Orthopaedic Physical Therapy*. New York: Churchill Livingstone; 1989:403-484.

LEG LENGTH INEQUALITY

Beattie P, Isaacson K, Riddle D, et al. Validity of Derived Measurements of Leg-Length Differences Obtained by use of a Tape measure. *Phys Ther.* 1990;70:150-157.

Butler J. Short Leg Backache. *The J Lancet.* 1946;10-11.

Cibulka M, Koldehoff R. Leg Length Disparity and its Effects on Sacroiliac Joint Dysfunction. *Clin Mgmt in Phys Ther.* 1986;6:10-11.

Clarke GR. Unequal Leg Length: An Accurate Method of Detection and Some Clinical Results. *Rheum Phys Med J.* 1972;2:385-390.

Fisk JW, Baigent ML. Clinical and Radiological Assessment of Leg Length. *New Zealand Med J.* 1975;81:477-480.

Friberg O. Clinical Symptoms and Biomechanics of the Lumbar Spine and Hip Joint in Leg Length Inequality. *The Military Hospital 3.* Kouvola, Finland; 1983:643-651.

Friberg O. Clinical Symptoms and Biomechanics of Lumbar Spine and Hip Joint in Leg Length Inequality. *Spine.* 1983;8:643-650.

Giles LGF, Taylor JR. Low Back Pain Associated With Leg Length Inequality. *Spine.* 1981;6:510-521.

Giles LGF, Taylor J. Lumbar Spine Structural Changes Associated With Leg Length Inequality. *Spine.* 1982;7:159-162.

Gofton J, Trueman G. Studies in Osteoarthritis of the Hip: Part 2, Osteoarthritis of the Hip and Leg Length Disparity. *Can Med Assoc.* 1971;104:791.

Maex L. Postural Headache and Migraine. *Headache.* Jan 1967:204-207.

Rush W, Steiner H. A Study of Lower Extremity Length Inequality. *Am J Roentgen.* 1946;56:616-623.

Subotnick S. Limb Length Discrepancies of the Lower Extremity. *JOSPT.* 1981;3:11-16.

OTHER

Sacroiliac joint fusion case study: <http://www.spineuniverse.com/professional/case-studies/sembrano/low-back-pain-due-sacroiliac-joint> (cut and paste in browser). April 28, 2011.

Goode A, Hegedus EJ, Sizer P, et al. Three Dimensional Movements of the Sacroiliac Joints: A Systematic Review of the Literature and Assessment of Clinical Utility. *J Man Manip Ther.* 2008;16(1):25-38.

Huijbregts P. Sacroiliac joint dysfunction: evidence-based diagnosis. Feature Article of the Orthopedic Division of the Canadian Physical Therapy Association. May/June 2004.

Huijbregts P. Evidence-based diagnosis and treatment of the painful sacroiliac joint. *J Man Manip Ther.* 2008;16(3): 153–154.

Hausler KK, McGilvary KC, Aytuk UM, et al. Deformation of the equine pelvis in response to in vitro 3D sacroiliac joint loading. *Equine Vet J.* 2009;41(3):207-12.

Gregersen G, Lucas D. An in vivo study of the axial rotation of the human thoracolumbar spine. *J. Bone and Joint Surg.* 1967;49A2:247-262.

Ivanov AA., Kiapour A., Ebraheim NA., Goel V. Lumbar fusion leads to increases in angular motion and stress across sacroiliac joint: a finite element study. *Spine.* 2009;34(5):162-9.

Prather H, Hunt D. Sacroiliac joint problems. In: Guanche CA, ed. *Hip and Pelvis Injuries in Sports Medicine.* Philadelphia, PA: Lippincott Williams & Wilkins; 2010:200-206.

Clem A, DeStephano L, Devine W, et al. Glossary of Osteopathic Terminology Usage Guide. <http://www.AACOM.org> ; 2006: accessed September 23, 2010.

Dar G., Khamis S., Peleg S., Masharawi Y., Steinberg N., Peled N., Latimer B., Hershkovitz I. Sacroiliac joint fusion and the implications for manual therapy diagnosis and treatment. *Man Ther.* 2008;13(2):155-8.

Flynn TW, Cleland JA., Whitman JM. Users Guide to Musculoskeletal Examination: Fundamentals for the Evidence-Based Clinician. Evidence in Motion; Buckner, NY: 2008:196-217.

Szadek KM, Hoogland PV, Zuurmond WW, de Lange JJ, Perez RS. Nociceptive nerve fibers in the sacroiliac joint in humans. *Reg Anesth Pain Med.* 2009;33(1):36-43.

Murakami E, Tanaka Y, Aizawa T, et al. Effect of periarticular and intraarticular lidocaine injections for sacroiliac joint pain: prospective comparative study. *J Ortoped Science.* 2007;12:274-280.

Alicioglu B., Kartal O., Gurbuz H., Sut N. Symphysis pubis distance in adults: a retrospective computed tomography study. *Surg Radial Anat* 2008;30:153-157.

Okuda T; Fujita T; Kaneuji A; et al. Stage-specific sagittal spinopelvic alignment changes in osteoarthritis of the hip secondary to developmental hip dysplasia. *Spine*. 2007;32(26):816-819.

Cusi M. Paradigm for assessment and treatment of SIJ mechanical dysfunction. *Journal of Bodywork & Movement Therapies*. 2010:1-10.

Ivanov AA., Kiapour A., Ebraheim NA., Goel V. Lumbar fusion leads to increases in angular motion and stress across sacroiliac joint: a finite element study. *Spine* . 2009;1;34(5):162-9

Malghem J, Vande Berg B, Lecouvet F, Koutaissoff S, Maldague B. Principles of analysis for sacroiliac joints imaging. *JBR-BTR* 2007;90(5):358-67.

Indahl A, Kaigle A, Reikeras O, et al. sacroiliac joint involvement in activation of the porcine spinal and gluteal musculature. *J Spin Disorders*. 1999;12(4):325-330.