case, to our knowledge, of a patient with TKA developing a calf compartment syndrome while receiving care in an inpatient rehabilitation unit. Further information will be discussed. **Conclusions:** Physiatrists must keep close vigilance and have a strong index of suspicion to diagnose the rare finding of compartment syndrome after TKA. **Key Words:** Arthroplasty, replacement, knee; Compartment syndromes; Rehabilitation.

Poster 145

A Novel Microanalytical Technique to Differentiate the Biochemical Milieu of Myofascial Trigger Points in Clinically Distinct Groups. Jay P. Shah, MD (Natl Inst Health, Bethesda, MD); Jerome V. Danoff, PhD; Terry M. Phillips, PhD; Lynn H. Gerber, MD, e-mail: *jshah@mail.cc.nih.gov.*

Disclosure: J.P. Shah, None; J.V. Danoff, None; T.M. Phillips, None; L.H. Gerber, None.

Objectives: To determine whether a novel microdialysis needle can successfully sample biochemical substances in the upper trapezius muscle in healthy subjects and whether there are measurable differences among those with and without symptoms and physical findings related to myofascial trigger points (MTPs). **Design:** Prospective, controlled. **Setting:** Biomedical research hospital. **Participants:** 3 subjects were selected based on history and physical examination to be in each of 3 groups (total 9 subjects): group 1: normal (no neck pain, no MTP); group 2: latent (no neck pain, MTP present); and group 3: active (neck pain, MTP present). **Interventions:** Samples were obtained continuously with the microdialysis needle at regular intervals, including needle insertion, elicitation of a local twitch response (LTR), and posttwitch. **Main Outcome Measures:** Pressure pain threshold (PPT) determined by pressure algometry. Levels of pH, substance P, calcitonin gene-related peptide (CGRP), bradykinin, serotonin, norepinephrine, tumor necrosis factor-α (TNF-α), and interleukin-β (IL-1β) determined by analysis of samples. **Results:** The active group had the lowest PPT ($P<.08$). Overall, the amounts of substance P, CGRP, bradykinin, serotonin, norepinephrine, TNF-α, and IL-1β were significantly higher in the active group than in either of the other 2 groups ($P<.01$). Overall, pH was significantly lower in the active group than in the other 2 groups ($P<.03$). In the active group, the amounts of substance P and CGRP were significantly lower at the end of sampling (posttwitch) than at baseline ($P<.02$). **Conclusions:** Our novel microanalytical technique enabled continuous, real-time sampling of extremely small quantities of very small substances directly from soft tissue, with minimal system perturbation. There were significant differences in pH, substance P, CGRP, bradykinin, serotonin, norepinephrine, TNF-α, and IL-1β among the 3 groups. The local biochemical milieu does appear to change with an LTR. Exploration of the biochemical profile of MTPs and normal muscle may help explain the pathogenesis, persistence, and amplification of myofascial pain. **Key Words:** Myofascial pain syndromes; Microdialysis; Rehabilitation; Trigger points, myofascial.

Poster 146

Anatomic Basis of Cluneal Neuropathy: A Cadaveric Dissection and Case Correlation. Christopher D'Ambrosia, MD (Univ Colorado Health Sci Ctr, Aurora, CO); John Tobey, MD; William Sullivan, MD; Venu Akuthota, MD, e-mail: *venu.akuthota@uchsc.edu.*

Disclosure: C. D'Ambrosia, None; J. Tobey, None; W. Sullivan, None; V. Akuthota, None.

Setting: University clinic and anatomy lab. **Patient:** Healthy 32-yo man. **Case Description:** The patient slipped on ice while walking down stairs. He fell onto the region around his left posterior superior iliac spine (PSIS). Sharp pain, worsened with transitions, was noted around the PSIS. Pain was exacerbated with contralateral trunk side-bending and twisting. 2wk later, formicating pain was noted into the left lateral buttock toward the gluteal crease. **Assessment/Results:** On examination, pain was elicited with hip flexion, trunk side-bending, and transverse plane twist. Exquisite tenderness and Tinel sign were noted over the posterior iliac crest and left lumbar paraspinals. Sensory exam revealed decreased sensation over the lateral left buttock. Radiographs were unremarkable. **Discussion:** A left superior cluneal neuropathy was diagnosed. A cadaveric dissection to identify all branches of the cluneal nerves was pursued because of the differing cluneal nomenclature noted in the literature. Dissection of the superior cluneal nerve was consistent with prior studies showing the nerve arising from the lateral branches of L1-3 dorsal rami and traversing through tunnels within the thoracolumbar fascia (TLF). A medial branch was shown to pass over the posterior iliac crest. Further dissection revealed that the lateral branches of the S1-3 dorsal rami came together as a web that provides cutaneous innervation of the medial buttock. We have termed these the *middle cluneal nerves* rather than the *inferior cluneal nerve*, as suggested by others. However, we feel the inferior cluneal nerve is properly the branch arising from the posterior femoral cutaneous nerve. **Conclusions:** The superior cluneal nerve is susceptible to trauma as it traverses beneath the TLF and crosses the posterior iliac crest. Cadaveric dissection shows the origins of the cluneal nerves and allows for their proper nosology. **Key Words:** Low back pain; Rehabilitation.

Poster 147

Improvement in Balance With Structural Integration (Rolfing): A Controlled Case Series in Persons With Myofascial Pain. Thomas W. Findley, MD, PhD (VA Med Ctr, East Orange, NJ); Karen Quigley, PhD; Miriam Maney, MA; Hans Chaudhry, PhD; Ismailu Agbaje, MD, PhD, e-mail: *findletw@njneuromed.org.*

Disclosure: T.W. Findley, None; K. Quigley, None; M. Maney, None; H. Chaudhry, None; I. Agbaje, None.

Setting: Private practice. **Patient:** Structural integration developed by Ida Rolf is a 10-wk organized approach of manual therapy to analyze and adjust tension in the body's fascial layers, directed at changing the structural alignment of the body in the upright position to allow it to function better and adapt to outside forces, particularly gravity, environment, and psychologic stresses. The components of the body must be in proper distribution and balance for economical movement with minimal stress. As a result of physical trauma or emotional stress, muscles and other tissues become displaced with compensatory adaptations of other muscles and fascial connections, often at distant points in the body. Through shortening and thickening of connective tissue and habitual patterns of movement, these muscular changes become chronic and involuntary. This study quantifies a subjective sense of increased stability reported after structural integration. **Case Description:** 12 persons with myofascial pain seeking structural integration were tested with NeuroCom Sensory Organization Test (SOT) initially and after 10 weekly sessions; 12 healthy controls and 15 persons with chronic fatigue syndrome were tested at least 8wk apart with no intervention. **Assessment/Results:** The normative average $\pm$ SD was 80 ± 5. 10/12 patients had initial balance scores below 70; of those who completed the intervention, 6 with abnormal balance scores improved an average of 17 points and 2 with normal balance scores did not change; overall, balance SOT score improved by 12 ± 10 points. The 5 control subjects with initial balance scores below 70 improved by 6 ± 10 points; overall, the 27 controls improved 2.9 ± 7 points. **Discussion:** Patient improvement was 2.5 times greater than test-retest improvements in the 2 control groups. **Conclusions:** Structural integration for persons with below normal balance is accompanied by demonstrable improvement in standing balance. **Key Words:** Alternative medicine; Equilibrium; Musculoskeletal manipulations; Posture; Rehabilitation.

Poster 148

Effects of Neuromuscular Electric Stimulation on Muscle Soreness and Plasma Creatine Kinase Concentration: A Pilot Study. Dinesh A. Kumbhare, MD, MSc (McMaster Univ, Hamilton, ON, Canada); William L. Parkinson, PhD; Brad Balsor, BSc; Kevin Fernandes, MSc; Andrew Gwardjan, MD; Pauline Boulos, MD, e-mail: *dkumbhar@stjosham.on.ca.*

Disclosure: D.A. Kumbhare, None; W.L. Parkinson, None; B. Balsor, None; K. Fernandes, None; A. Gwardjan, None; P. Boulos, None.

Objective: To investigate the tolerability and safety of neuromuscular electric stimulation (NMES) using measures of muscle soreness and plasma creatine kinase concentrations. **Design:** Randomized controlled trial with repeated measures. Subjects were stratified by age and quadriceps maximal isometric force, and randomly assigned to 2 groups differing on eccentric versus concentric muscle contractions. **Setting:** Rehabilitation clinic in a teaching hospital. **Participants:** 12 men between the ages of 21 and 55y, with no medical conditions precluding exercise. **Interventions:** Maximal isometric force was measured for the right leg on a KinCom machine before and after NMES. During NMES, the KinCom produced nonvolitional movement in the concentric or eccentric direction for 20 repetitions. NMES was delivered to 4 electrodes on the right quadriceps. NMES frequency started at 30Hz; the pulse width was increased until contractions were 70% of peak voluntary contraction. **Main Outcome Measures:** Muscle soreness using a 10-cm visual analog scale (VAS) immediately prior to NMES, immediately after NMES, at 5h, and daily for 4d; muscle injury indexed by plasma creatine kinase (CK) concentration immediately prior to NMES, immediately after NMES and at 5h and on day 4; and peak force measured immediately before and after NMES to establish fatigue. **Results:** Data were analyzed using analysis of variance. NMES produced a trend toward reduced peak force ($P=.07$), indicating sufficient NMES intensity. Mean VAS pain increased over time ($P<.01$), peaking at day 2 and returning to baseline by day 4 in both groups. Mean CK concentration did not change over time. There were nonsignificant trends toward greater fatigue or muscle soreness in the eccentric group compared with the concentric group. **Conclusions:** NMES produced temporary discomfort consistent with delayed-onset muscle soreness characteristic of volitional exercise. CK levels indicated no muscle injury. **Key Words:** Creatine kinase; Electric stimulation; Pain; Rehabilitation.

Poster 149

Quantitative Balance and Self-Reported Health Status in Medically Unexplained Illness. Ismailu O. Agbaje, PhD, MD (War Related Illness and Injury Study Ctr, East Orange, NJ); Karen Quigley, PhD; Mariam Maney, MA, CPHQ; Benjamin Natelson, MD; Thomas Findley, MD, PhD, e-mail: *agbaje@njneuromed.org.*

Disclosure: I.O. Agbaje, None; K. Quigley, None; M. Maney, None; B. Natelson, None; T. Findley, None.

Objective: To explore the relation between self-reported health survey and standing balance, which is sensitive to exposures such as jet fuel and sarin. **Design:** Observational study with 2 control groups. **Setting:** Veteran Administration. **Participants:** 19 veterans with medically unexplained illness, 27 with chronic fatigue syndrome (CFS), and 17 age-matched controls. **Interventions:** Not applicable. **Main Outcome Measures:** In the Sensory Organization Test (SOT) (EquiTest), subjects are asked to stand on a movable platform under 6 sensory conditions: eyes open, quiet stance (control condition); eyes closed, quiet stance; sway-referenced visual surround; sway-referenced support surface; sway-referenced support with eyes closed; and sway-referenced support and visual surround. The SF-36 is a well-validated self-administered questionnaire, which elicits information on 8 different aspects of health: physical functioning, role–physical, bodily pain, general health, vitality and energy, social functioning, role–emotional, and mental health and emotional well-being. These are combined into physical composite score (PCS) and mental composite score (MCS). **Results:** 50% of veterans scored more than 2 SDs below normal on balance testing versus 10% of controls and 35% of subjects with CFS. SOT score correlated well with age, body mass index, MCS, PCS, and diagnosis ($r^2=.78$, $P<.001$). **Conclusions:** Quantitative balance testing is abnormal in many deployed veterans with unexplained medical symptoms. Our preliminary findings of a high correlation between the SOT score derived from the EquiTest and self-reported health suggest that subtle balance problems are important factors in perceived health status. **Key Words:** Posture; Questionnaires; Rehabilitation; Severity of illness index.

Rehabilitation Topics

Poster 150

The Effect of Walking Speed on the Linear Synergy of Gait. Jennifer L. Lelas, MS (Spaulding Rehabil Hosp, Boston, MA); Gerald L. Gottlieb, PhD; Vanessa Portra; Daniel Corcos, PhD, e-mail: *jlelas@partners.org.*

Disclosure: J.L. Lelas, None; G.L. Gottlieb, None; V. Portra, None; D. Corcos, None.

Objective: To investigate the effect of walking speed on linear synergy (ie, that torque patterns of joints involved in motion are scaled versions of each other) during gait. **Design:** Randomized, prospective study. **Setting:** Motion analysis laboratory. **Participants:** Healthy adults. **Interventions:** Participants were asked to walk at their self-selected comfortable pace, a pace 25% faster, and