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CENTERS FOR DISEASE CONTROL OPIOID GUIDELINES

Opioid prescription per capita in the United States increased 7.3% from 2007 to 2012. The Centers for Disease Control and Prevention (CDC), noting potential problems with opioid prescriptions, met to create guidelines for primary care providers.

The process of creating the guidelines involved using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework, with a systematic review of the scientific evidence. The focus of these guidelines was for primary care physicians treating adult patients with pain lasting more than three months in outpatient settings. The literature was reviewed for opioid efficacy and risk, followed by a solicitation of expert opinion, stakeholders, the public, peer reviewers, and a federally chartered advisory committee.

Twelve recommendations were made. Summarized, these include considering opioid therapy only if expected benefits for pain and function outweighed the risks, with opioid therapy continued only if there is clinically meaningful improvement in pain and function. These should be combined with nonpharmacologic and non-opioid therapy. Treatment goals should be established initially, with risks discussed. When initiating, immediate release should be prescribed at the lowest effective dose, carefully reassessing at 50 morphine milligram equivalents (MME), and should be avoided at 90 MME or higher.

For acute pain, three days or less of opioid therapy should be sufficient. Harms and benefits should be evaluated one to four weeks after starting opioids for chronic pain. Before starting, and periodically during opioid therapy, the risks should be evaluated and plans to mediate these risks should be made, including offering naloxone. Clinicians should review the patient's history of controlled substance prescriptions using state prescription drug monitoring programs (PDMP). Urine drug testing before and at least annually should be used to assess the use of prescribed and other medications. Combining opioids and benzodiazepines concurrently should be avoided. Clinicians should offer or arrange evidence-based treatment for patients with opioid disorders.

Conclusion: This guideline, published by the Centers for Disease Control and Prevention provides succinct recommendations for primary care physicians who wish to prescribe opioid medications for noncancer pain.

Dowell, D., et al. CDC Guidelines for Prescribing Opioids for Chronic Pain-United States, 2016. **Morbidity Mortality Weekly Report.** 2016, March 18:65(1);1-49.

EXTENDED RELEASE NALTREXONE TO PREVENT OPIOID RELAPSE

Opioid–use disorder is a chronic condition with serious public health consequences. Extended release naltrexone, the monthly injectable formulation, was approved by the FDA in 2010 for the prevention of relapse to opioid dependence. This study examines the effectiveness of extended release naltrexone among community dwelling criminal justice offenders at high risk for opioid relapse.

This open label, randomized controlled trial included community dwelling adult volunteers who had been incarcerated with a history of opioid dependence. Subjects were randomized to a treatment group to receive extended release naltrexone, or a usual care group. Those in the treatment group received extended release naltrexone at a dose of 380 mg administered by intramuscular injection once every 4 weeks. Those in the usual care group received counseling focused on adverse events, the prevention of relapse and overdose and support for community treatment from the same trial personnel. Subjects were followed every 2 weeks for 24 weeks during the treatment phase, with assessments including urine toxicologic screening and self-report of opioid, cocaine, alcohol and IV drug use. The primary outcome was the time in weeks to opioid relapse during the 24 week treatment phase.

From 5 sites, 308 subjects underwent randomization with a mean age of 44 years. During the treatment phase, time to relapse was longer in the treatment groups than in the usual care group (10.5 weeks versus 5 weeks; $p<0.001$). All recorded overdose events occurred among participants in the usual care group. Self-reported use of cocaine, alcohol and IV drug use, unsafe sex and re-incarceration did not differ between the 2 groups.

Conclusion: This study of criminal justice offenders found that the use of extended release naltrexone could result in a lower rate of opioid relapse than occurs in usual treatment.

Lee, J et al Extended Release Naltrexone to Prevent Opioid Relapse in Criminal Justice Offenders. **N Eng J** Med 2016, March 31; 374(13):1232 –1242

PREVALENCE OF SPORTS-RELATED SPINAL CORD INJURY

Spinal cord injury (SCI) most commonly occurs as a result of motor vehicle accidents and falls. These injuries can also occur as a result of participation in sports. This systematic review of the literature was completed to determine the

proportion of SCIs resulting from sports, and to compare sports-related SCIs across countries and sports.

A literature search was completed for articles between 1980 and 2015 concerning sports-related SCI. Studies were included that reported on the proportion of sports-related SCI relative to all cause traumatic SCI and the proportion of SCI for specific sports relative to all sport-related SCI.

Of the 1,001 articles initially identified, 54 papers were chosen for inclusion. From these, it was determined that the six countries with the highest proportion of SCIs caused by sport were Russia, with 32.9% followed by Fiji (32%), New Zealand (20%), Iceland (18.8%), France (15.8%) and Canada (13.1%). The six countries with the lowest proportion of SCIs caused by sport were Turkey (3%), Jordan (2.6%), Nepal (2%), Malaysia (2%), China (1.8%), and Nigeria (1.7%). The sports which caused the greatest number of SCIs worldwide were diving, rugby, horseback riding and skiing.

Conclusion: This study found that the individual sports with the highest risk for spinal cord injury were diving, skiing, rugby and horseback riding. In Russia, 32.9% of spinal cord injuries were sport-related, while in Nigeria, only 1.7% of such injuries were related to sport.

Chan, C., et al. Epidemiology of Sport -Related Spinal Cord Injuries: A Systematic Review. **J Spinal Cord Med.** 016.10.1080/10790268.2016. 1138601

TASK–ORIENTED REHABILITATION FOR UPPER EXTREMITY RECOVERY AFTER STROKE

Clinicians caring for patients with stroke lack evidence for the determination of the optimal type and amount of motor therapy during outpatient rehabilitation. Previous studies performed during the long-term phase of stroke, after initial rehabilitation had been completed, have suggested that intensive, high-repetition, task-oriented training is superior to usual care for improving upper extremity motor outcomes. This study tested the effect of the same task oriented approaches during the outpatient phase of rehabilitation, typically beginning one month after stroke.

Adult patients with moderate upper extremity impairment after ischemic or hemorrhagic stroke were recruited. The patients were randomized to a treatment arm, to receive a structured and task-oriented, upper extremity motor training program, the Accelerated Skill Acquisition Program (ASAP). A second group received dose equivalent usual and customary care (DEUCC). A third were placed in a monitor only, usual and customary care group (UCC).

All participants were assessed at baseline, at the end of therapy, at six months and at 12 months after randomization. The primary outcome measure was the change at month 12 on the Wolf Motor Function Test (WMFT) time score. Secondary outcomes included WMFT minimum clinically important difference and improvement in participant reported Stroke Impact Scale (SIS).

A total of 304 patients completed the twelve-month evaluation. At follow-up, no significant differences were seen in WMFT scores between the ASAP, the DEUCC and the UCC groups. In addition, there were no significant differences between the groups in the secondary outcome measures.

Conclusion: This study of patients with motor stroke and primarily moderate upper extremity impairment found that the use of a structured, task-oriented rehabilitation program was not superior in motor recovery scores to usual and customary occupational therapy during outpatient rehabilitation.

Winstein, C., et al. Effectiveness of a Task-–Oriented Rehabilitation Program on Upper Extremity Recovery Following Motor Stroke. The ICARE Randomized, Clinical Trial. **JAMA.** 2016, February 9: 315 (6): 571-581.

TRANSCRANIAL DIRECT CURRENT STIMULATION AND MOTOR LEARNING AFTER STROKE

Stroke is a leading cause of chronic motor disability in the United States, with over 50% of chronic stroke patients displaying residual motor dysfunction and hemiparesis. Among the many interventions for

stroke, transcranial direct stimulation (tDCS) has been identified as a potential adjunct to traditional treatments. This review and meta-analysis was designed to further clarify the efficacy of this treatment modality for motor learning after stroke.

A literature search was completed for studies investigating the long-term treatment effects involving motor function after tDCS treatment of stroke. Inclusion criteria for the meta-analysis included studies with quantitative evaluation of the effects of tDCS on motor learning, using annodal, cathodal or bilateral stimulation, with a sham control comparison group, and with treatment combined with motor training.

Of the studies reviewed, 17 were selected for analysis. Annodal M1 ipsilateral, cathodal M1 contralateral and bilateral stimulation revealed significant motor treatment effects ($p=0.003$, $p=0.009$, and $p<0.0001$, respectively). Treatment effects were found for both the subacute and chronic stages of treatment. Effects were evident with stimulation applied both before and during motor training.

Conclusion: This meta-analysis of patients treated for stroke demonstrates positive, long-term motor learning effects of transcranial direct current stimulation combined with motor training.

Kang, N., et al. Transcranial Direct Current Stimulation Facilitates Motor Learning Post-Stroke: A Systematic Review and Meta-Analysis. **J Neurol Neurosurg Psychiatry.** 2016, April; 87(4): 345-355.

TESTOSTERONE TREATMENT IN OLDER MEN

In 2003, the Institute of Medicine concluded that there was insufficient evidence that testosterone treatment is beneficial in older men. This study further investigated whether testosterone benefits older men with age-related low testosterone.

Eligible subjects were 65 years or older with testosterone levels averaging less than 275 ng/dL. Each individual participated in one of three trials, including a sexual function trial, a physical function trial and a vitality trial. The subjects were randomly signed to receive AndroGel, with the dose adjusted to keep the concentration within the normal range for young men. Serum testosterone was measured at months one, two, three, six and nine.

Efficacy outcomes were assessed at baseline and after three, six, nine and 12 months of treatment. The primary outcome of the sexual function trial was the change in sexual activity on the Psychosexual Daly Questionnaire. The primary outcome of the physical function trial was the percent of men who increased the distance walked in the six-minute walk test by at least 50 m. The primary outcome of the vitality trial was a percentage of men whose scores increased on the FACIT-Fatigue Scale by at least four points.

Of the 705 men who completed the study, serum testosterone levels were raised in the treatment group to the mid-normal range in 91%. Testosterone treatment was associated with increased sexual activity, increased sexual desire and increased erectile function. Among all testosterone trials, treatment improved the six-minute walk distance and physical function.

Among those in the Vitality trial, there was no significant difference between groups in the primary outcome measure, although significant differences were seen between groups in vitality, affect and depression scores. Adverse events were equivalent between the placebo and treatment groups.

Conclusion: This study of elderly men with low testosterone levels found that supplementation could improve sexual function and performance in six-minute walk test distances and improve affect and vitality, but did not substantially decrease fatigue.

Snyder, P., at al. Effects of Testosterone Treatment in Older Men. **N Eng J Med.** 2016, February 18; 374(7): 611-624.

FLUOXETINE FOR ISCHEMIC STROKE

Previous studies have reported that selective serotonin reuptake inhibitors (SSRIs) might improve motor function for patients with ischemic stroke, independent of their effect on post-stroke depression. Given the limitations of previous studies, this study further investigated the effects of fluoxetine on neural recovery after ischemic stroke.

Adult patients with ischemic stroke and with National Institute of Health Stroke Scale Scores (NIHSS) of above two were studied. The subjects were randomized to a treatment group, to receive fluoxetine, 20 mg per day for 90 days, or to a control group, to receive a similar appearing placebo. The participants were assessed with the NIHSS and the Barthel index (BI), with assessments performed at days 15, 90, and 180.

A total of 374 eligible patients were allocated to one of the two groups, with 171 in the control group and 179 in the treatment group completing the study. No significant difference was found between the groups in NIHSS scores at day 15, while significantly better scores were found in the treatment group than in the control group on days 90 and 180 ($p=0.033$ and $p=0.013$, respectively). In addition, improvements in BI scores were significantly greater in the treatment group than in the control group at days 90 and 180 ($p=0.013$ and $p=0.019$, respectively).

Conclusion: This study of adult patients with ischemic stroke found that treatment with fluoxetine within two weeks of stroke improves long-term functional recovery.

He, Y., et al. Effects of Fluoxetine on Neural Functional Prognosis after Ischemic Stroke: A Randomized Controlled Study in China. **J Stroke Cerebrovasc Dis**. 2016, April; 25(4): 761-770.

OUTCOMES OF STROKE PATIENTS ADMITTED DURING NORMAL WORKING HOURS

Previous studies have demonstrated an outcome disparity between those patients admitted to hospitals during the week and those admitted during weekends. This study examined the impact of time of admission on the process of stroke care and outcomes of patients with stroke admitted to an acute care hospital.

This historical, prospective, cohort study used data from National Scottish data sets between January of 2005 and December of 2013, with data including time of admission, hospital care data and short-term and long-term survival at seven, 30 and 365 days following admission.

Data included that of 21,285 patients admitted on a weekday, 15,705 on a weeknight and 15,286 on a weekend or holiday. Brain scans on day zero or day one of admission occurred in 77.4% of those admitted on weekends, 86.5% of those admitted on weekdays and 82.2% on weeknights. Admission to the stroke unit on day zero or day one of admission was lower for patients admitted on a weeknight or weekend as compared to a weekday. Mortality was higher for patients admitted on a weekend. Discharge to home or usual place of residence was also lower for those admitted on a weekend. The odds ratios for seven-day mortality for weekend/holiday and weeknight admissions were higher, and the 30-day discharges to home were lower compared to those admitted on the weekday.

Conclusion: This study provides evidence that the time that a patient with a stroke presents to the hospital may influence the outcome.

Turner, M., et al. Stroke Patients Admitted within Normal Working Hours Are More Likely to Achieve Process Standards and to Have Better Outcomes. **J Neurol Neurosurg Psychiatry.** 2016, February; 87 (2): 138-143.

MOBILE STROKE UNITS FOR THROMBOLYSIS

As thrombolytic treatment for acute strokes is time sensitive, many patients are unable to obtain this treatment due to delays in presentation to the hospital. Previous studies have shown that mobile stroke units may reduce the time to evaluation and thrombolysis. This study reviewed the effectiveness and feasibility of a mobile stroke treatment unit (MSTU) in the United States.

Patients with suspected ischemic stroke were evaluated by the MSTU team equipped with a CT scanner and laboratory equipment, with care coordinated through telemedicine by a hospital vascular neurologist (VN). The National Institute of Health Stroke Scale was performed in collaboration with the VN, with eligible patients receiving IV thrombolysis in route. The aims of the study were to assess the operation of the MSTU, including successful team evaluation and telemedicine connection, and to compare the time efficiency of the MSTU evaluation with that of the control ED evaluation.

Of the 317 EMS calls, 100 patients underwent evaluation by the MTSU, with an initial diagnosis of probable ischemic stroke for 33 patients. These subjects were compared with 56 age and stroke matched patients seen in the ED. For the MTSU group, the median door to CT completion time was 13 minutes and the median door to IV thrombolysis time was 32 minutes. For the 16 patients receiving IV thrombolysis, the time to thrombolysis was reduced by 26 minutes, as compared with that of the ED controls ($p<0.001$).

Conclusion: This study demonstrates that a mobile stroke treatment unit, using telemedicine to coordinate with a hospital-based vascular neurologist, can significantly decrease door to CT evaluation time, and door to treatment time, for patients with ischemic stroke.

Itrat, A., et al. Telemedicine and Prehospital Stroke Evaluation and Thrombolysis: Taking Stroke Treatment to the Doorstep. **JAMA Neurol**. 2016, February; 73(2): 162-168.

NEUTROPHIL TO LYMPHOCYTE RATIO PREDICTS LENGTH OF STAY AND HOSPITAL COST AFTER STROKE

The greatest direct economic costs of ischemic stroke can be attributed to the patient's length of stay (LOS) in the hospital. As the inflammatory response after stroke is thought to be implicated in all stages of ischemic stroke, some have studied the systemic neutrophil to lymphocyte ratio (NLR) as an indication of stroke severity. This study was designed to determine whether the NLR is associated with LOS and acute hospital cost.

Consecutive patients with acute ischemic stroke, admitted to Jinling Hospital within 24 hours of symptom onset, were studied. Baseline data were collected from medical records, including demographics, vascular risk factors, hospital LOS, costs and laboratory parameters.

Of the patients screened, 346 were included in the study, with a mean age of 60.8 years. Length of stay was associated with NLR, diabetes and stroke severity on admission. Subjects with a LOS of 11 days or more were more likely to have a higher NLR ($p<0.001$). A multi-variate linear regression analysis found that the independent factors associated with LOS were work type, NLR, diabetes mellitus, NIHSS score on admission and non-small vessel occlusion. Significant factors for acute hospital cost were NLR, NIHSS score on admission and LOS.

Conclusion: This study found that patients admitted with ischemic stroke with higher neutrophil to lymphocyte ratios had increased lengths of stay and acute hospital costs as compared to those with lower ratios.

Zhao, L., et al. Neutrophil to Lymphocyte Ratio Predicts Length of Stay and Acute Hospital Cost in Patients with Acute Ischemic Stroke. **J Stroke Cerebrovasc Dis**. 2016, April; 25 (4): 739-744.

INTRACEREBRAL HEMORRHAGE RELATED TO NEW ORAL ANTICOAGULANTS

Intracerebral hemorrhage (ICH) is responsible for most deaths caused by bleeding complications during long-term anticoagulation. As ICH during anticoagulation with a vitamin K antagonist accounts for 10 to 25% of all occurrences of ICH, the use of non-vitamin K antagonist oral anticoagulants (NOACs) is increasing. This study was designed to characterize the early clinical and radiologic course, as well as management and outcomes, of patients with NOAC associated ICH.

Subjects were consecutive patients from multiple centers with acute nontraumatic ICH while undergoing treatment with apixaban, dabigatran or rivaroxaban. Data collected included baseline characteristics and clinical, laboratory and radiologic findings. All subjects underwent a neurologic evaluation using the National Institute of Health Stroke Scale (NIHSS), with outcomes evaluated using the modified Rankin score (mRS) at various points in time. Hematoma volume measurements were calculated through imaging.

Subjects were 61 patients with a mean age of 76 years. The median baseline hematoma volume was 10.8 mL. Comparing with previous studies of vitamin K antagonist associated

ICH, ICH size and location were similar. Overall mortality was 28% at three months, with 65% having an unfavorable outcome (mRS, 3-6). While 57% received prothrombin complex concentrate for reversal, these patients did not have less hematoma expansion or improved outcome.

Conclusion: This study of patients with intracerebral hemorrhage while taking non-vitamin K antagonist oral anticoagulants found high mortality and largely unfavorable outcomes. The effectiveness of reversal agents could not be determined.

Purrucker, J., et al. Early Clinical and Radiological Course, Management and Outcome of Intracerebral Hemorrhage Related to New Oral Anticoagulants. **JAMA Neurol.** 2016, February; 73(2): 169-177.

JOINT INFLAMMATION AND PAIN SENSITIZATION IN OSTEOARTHRITIS

Although osteoarthritis (OA) is traditionally considered a systematically noninflammatory arthritis, studies have demonstrated local inflammation, as evidenced by cellulitis and effusion. Bone marrow lesions are the predominant micro-traumatic lesions related to excessive mechanical load or remodeling related to tissue injury. This study examined whether inflammation or bone marrow lesions are associated with pain sensitization in knee OA.

This study, the multicenter osteoarthritis study (MOST), is a National Institute of Health funded longitudinal cohort of older adults with or at risk for knee OA. All subjects were assessed at baseline, and at 30, 60, and 84 months using MRI imaging, standardized questionnaires and objective measurements of relevance to knee OA. Data were evaluated for the relationship between MRI findings and mechanical temporal summation, (an augmented response to repetitive mechanical stimulation) and pressure pain threshold (PPT).

Data were analyzed for 716 patients with a mean age of 66.9 years and a mean body mass index of 29.7 kg/m^2. Of these, 38% had radiographic knee OA at baseline and 21% reported frequent knee pain at baseline. Those with synovitis at baseline had significantly lower PPT at baseline and a significant decrease in PPT at the patella 24 months later, indicating that they had become more sensitized. Baseline effusion and bone marrow lesions were not associated with baseline PPT, baseline temporal summation or change in PPT at the patella over 24 months. Effusion was also associated with a decrease in PPT at the wrist and with the risk of incident temporal summation at the patella. Bone marrow lesions were not associated with sensory testing measures.

Conclusion: This study found that MRI findings of synovitis or effusion are associated with pain sensitization among patients with knee OA, with effects noted distant from the knee, suggesting central sensitization.

Neogi, T., et al. Association of Joint Inflammation with Pain Sensitization in Knee Osteoarthritis. **Arthritis Rheum**. 2016, March; 68(3): 654-661.

TREATMENT OF PAINFUL DIABETIC NEUROPATHY

Of the 26 million individuals in the United States with diabetes mellitus, approximately half suffer with painful diabetic neuropathy (PDN). Symptomatic PDN is typically treated with medications including desipramine (DES), pregabalin (PRE), duloxetine (DUL) or gabapentin (GABA). Guidelines differ concerning which should be the first line therapy. This study reviewed the efficacy and long-term cost-effectiveness of starting patients for treatment of PDN with one of these medications.

A health state transition model was developed to compare the cost effectiveness of beginning treatment for PDN with PRE, DUL, GABA or DES. Microsimulation was used to estimate outcomes. Model outcomes were quality-adjusted life years (QALYs) and direct medical costs. Model inputs for clinical effectiveness, adherence and utilities were derived from estimates in the published literature.

The model wherein the treatment was started with DES resulted in the lowest average cost per patient, followed by treatment beginning with GABA, DUL and PRE. The highest average quality of life gained per patient was found in the group that began treatment with DUL, followed by PRE, GABA and DES.

Conclusion: This study evaluated the cost effectiveness of initiating different medications for painful diabetic neuropathy, finding that the most cost effective initial medication was DES, and the most effective treatment medication was DUL.

Bellows, B., et al. Long-Term Cost Effectiveness of Initiating Treatment for Painful Diabetic Neuropathy with Pregabalin, Duloxetine, Gabapentin or Desipramine. **Pain**. 2016, January; 157(1): 203-213.

PHARMACOTHERAPIES FOR FRACTURE PREVENTION AFTER GLUCOCORTICOID USE

Oral glucocorticoids are crucial for the management of chronic inflammatory and autoimmune diseases. However, the use of oral glucocorticoids is a common cause of iatrogenic osteoporotic fractures. This study assessed the efficacy of different interventions for the prevention of osteoporosis among glucocorticoid users.

Data were reviewed from published data through March of 2015. Eligible studies were double-blinded, randomized, controlled trials including patients with continuous oral glucocorticoid use during the study timeframe, with a follow-up of at least six months.

The studies selected for analysis included a total of 3,286 patients with 12 agents examined, including placebo, calcium, calcium plus vitamin D, alendronate, etidronate, ibandronate, risedronate, zoledronic acid, calcitonin, raloxifene, denosumab, and teriparatide. The mean glucocorticoid dose ranged from five to 25 mg per day, with a duration ranging from six to 102 months.

Those treated with etidronate, risedronate and teriparatide had reduced vertebral fractures, although no studies were found to have significant effects for the treatment of non-vertebral fractures. Teriparatide was ranked as the best for preventing vertebral and nonvertebral fractures.

Conclusion: This meta-analysis of studies reviewing the efficacy of pharmacotherapies for preventing fractures among glucocorticosteroid

users found that several drugs are effective in preventing osteoporotic fractures.

Amiche, M., et al. Efficacy of Osteoporosis Pharmacotherapies in Preventing Fracture among Oral Glucocorticoid Users: A Network Meta-Analysis. **Osteoporosis Intern.**DOI 10.1007/s00198-015-3476-4

SILENT BRAIN INFARCTION AND RISK OF STROKE

Stroke is a leading cause of death worldwide, as well as a leading cause of disability. The identification of subclinical stroke risk factors may allow for early preventative measures. Although many studies have described the predictive value of silent brain infarcts (SBIs) the importance of these events is not fully understood. This review and meta-analysis was designed to determine whether MRI detection of SBI is a predictor of subsequent stroke.

Medical databases were scanned for studies of adult subjects with MRI determination of SBI, with a mean follow-up time of at least 12 months. A meta-analysis of the individual study crude risk ratios of stroke was conducted.

Of the studies identified for evaluation, 13 met all inclusion criteria for the meta-analysis. All but one were prospective studies. The mean follow-up time ranged from 25.7 to 174 months. From the studies, approximately 18% of the participants were found to have an SBI. A positive relationship was found between the presence of SBI and the risk of stroke, with a random effects crude risk ratio of 2.94, and a random effects adjusted hazard ratio of 2.08.

Conclusion: This meta-analysis of patients with no history of stroke found that those with silent brain infarction detected on MRI were at twice the risk of subsequent stroke as were those without silent infarctions.

Gupta, A., et al. Silent Brain Infarction and Risk of Future Stroke: A Systematic Review and Meta-Analysis. **Stroke.** 2016, March; 47 (3): 719-725.

ULTRASOUND GUIDANCE FOR SUBACROMIAL INJECTIONS

Subacromial impingement is one of the most common causes of shoulder pain in adults, with corticosteroid injections one of the most common management tools for this condition. Ultrasound (US) guidance has been recommended for these injections due to the increased accuracy provided by its use. This study compared the clinical effectiveness of US-guided subacromial injections with that of blind subacromial injections.

This prospective, double-blind, randomized, controlled trial included 51 patients with a diagnosis of subacromial impingement with 28 shoulders undergoing US-guided injections and 28 receiving a landmark guided injection. Examiners held blind to group assignment performed clinical evaluations before and after the procedures.

Both groups realized significant improvement at week six in visual analog scale scores for pain with overhead activities, decreasing from 59 to 33 in the US group ($p<0.001$), and from 63 to 39 in the landmark guided group ($p<0.001$). American Shoulder and Elbow Surgeons (ASES) scores improved from 57 to 68 at week six in the US group ($p<0.01$) and from 54 to 65 in the landmark guided group ($p<0.01$). No significant difference was seen between groups in either measurement.

Conclusion: This study found no significant difference in clinical outcomes for ultrasound guided versus landmark guided subacromial injections for the treatment of subacromial impingement syndrome.

Cole, B., et al. Ultrasound-Guided versus Blind Subacromial Corticosteroid Injections for Subacromial Impingement Syndrome. Randomized, Double-Blind, Clinical Trial. **Am J Sports Med**. 2016, March; 44(3): 702-707.

PRECUT KINESIOLOGY TAPE FOR SUBACROMIAL IMPINGEMENT

Subacromial impingement is among the most frequently diagnosed shoulder disorders in adults, with its lifetime prevalence estimated to be as high as 36%. While the initial management is most often with physical/exercise therapy, some studies have suggested that kinesiology tape may be effective. This prospective study examined the effectiveness of precut kinesiology tape as compared with that of nonsteroidal anti-inflammatory drugs for reducing shoulder pain among patients with subacromial impingement.

This prospective, parallel group, randomized, controlled trial included patients with a primary complaint of shoulder pain, further diagnosed with subacromial impingement syndrome. The subjects were randomized to receive precut kinesiology tape and exercise (K), Naprosyn 500 mg twice daily and exercise (N), or exercise alone(E) for a total of four sessions over two weeks. The primary outcome measure was the numeric pain rating scale (NPRS), with secondary measures including the Simple Shoulder Test (SST) and the Constant Score.

Of the 100 individuals who completed the study, all three groups had a significant decrease in pain by all measures. Between group differences on all outcome measures were not statistically significant or clinically meaningful.

Conclusion: This study of patients with subacromial impingement who underwent exercise therapy found no clinically meaningful difference in outcomes between patients who received additional treatment with Naprosyn or precut kinesioolgy tape.

Devereaux, M., et al. Short-Term Effectiveness of Precut Kinesiology Tape Versus an NSAID as Adjuvant Treatment to Exercise for Subacromial Impingement: A Randomized, Controlled Trial. **Clin J Sports Med.** 2016, January; 26(1): 24-32.

WEIGHT CHANGE AFTER SPINAL CORD INJURY

Individuals with disabilities have a higher prevalence of obesity than do the general population. However, literature concerning weight change after spinal cord injury (SCI), as well as factors associated with patterns of weight loss or gain, is limited. This study evaluated the patterns weight change one year post-SCI, in an effort to identify factors associated with weight change.

Data were retrieved from 16 SCI model systems, with information obtained for 1,094 individuals ranging in age from 17 to 88 years, all with traumatic SCI. All patients were discharged from rehabilitation between October of 2006 and November of 2012. Body mass index (BMI) was compared at the time of discharge and at one-year follow-up. Patient characteristics were

compared between those with and those without significant weight changes.

The baseline BMI of the participants averaged 26.3 kg/m², while that at one year post-injury averaged 25.8 kg/m². In the first year, 19.1% maintained their weight, 33.4% gained over two kg and 47.5% lost over two kg. Those classified as overweight or obese during rehabilitation demonstrated an average decrease in BMI at one-year of 1.4 kg/m², while those classified as underweight or normal weight demonstrated an average increase of 0.5 kg/m². Gender, education, neurologic level of injury, ethnicity, mental status, age and education were all significant contributors to change in BMI.

Conclusion: This study of patients with traumatic spinal cord injury found that, on average the mean BMI decreases slightly during the first year post-injury. Those who were overweight at injury tend to lose weight, and those were underweight at injury tend to increase weight.

Powell, D., et al. Weight Change after Spinal Cord Injury. **J Spinal Cord Med.** 2016, 10.1179/2045772314Y.0000000264

RETURN TO WORK AFTER STROKE

Worldwide, the number of stroke patients who are able to return to work varies from 14% to 73%. In India, rehabilitation centers are scarce, with most rehabilitation provided by caregivers. This Indian cross-sectional study examined the association among functional disability, psychosocial factors, and the decision to return to work.

This study was conducted at two tertiary sites in India. Adult patients, three to 24 months post-stroke, who had reported working prior to the stroke, were studied. Information concerning stroke severity and progression of functional status were recorded. Questionnaires were used to obtain demographic information, type of previous work and other factors associated with return to work. All patients were administered the Hospital Anxiety and Depression Scale (HADS) and the Duke-UNC Functional Social Support Questionnaire (FSSQ), the latter to assess mental health and social support.

Of the 141 patients included, 52.5% returned to work. The average modified Rankin Scale score at three months post-stroke was 1.7. Of the subjects, 42% met the criteria for depression and 56% for anxiety. Successful return to work was associated with an age of under 50 years, [odds ratio (OR) 2.24], employment in business jobs, (OR 3.02) and lower modified Rankin Scale scores (OR 3.7). Return to work was not associated with social support, anxiety or depression.

Conclusion: This Indian study of patients with stroke and mild to moderate disability found that approximately half return to work. Disability severity, younger age and occupation type were the factors most associated with the likelihood of return to work.

Bonner, B., et al. Factors Predictive of Return to Work after Stroke in Patients with Mild-Moderate Disability in India. **Euro J Neurol**. 2016, March; 23: 548-553.

PATIENT DISCHARGE READINESS AND RISK OF READMISSION

Readmissions to hospital within 30 days of discharge occur in as many as 20% of adults, and are important as a quality of care measure. Readmissions account for 17% of hospital payments received from Medicare in the United States and 11% of inpatient care costs in Canada. This study examined predictors of readmission or death among patients discharged from hospital general internal medicine wards, in order to determine the effect of the patient's readiness for discharge on readmission.

This study was designed as a secondary analysis from a perspective cohort of patients discharged to the community from general internal medicine wards of tertiary teaching hospitals. At hospital discharge, structured personal interviews were conducted with patients, who were asked to rate on an 11 -point Likert scale their readiness for discharge. The primary outcome measures were readmission or death within 30 days.

Of the 495 patients evaluated, 23% reported being not ready for discharge. The factors associated with this status included cognitive impairment, low satisfaction with healthcare services, depression, lower education, previous hospital admissions within the past year, and persistent symptoms or disability. In 30 days, 17% of patients expired or were readmitted. There was no significant difference in readmission rates between those who felt ready for discharge and those who did not feel ready for discharge (15% versus 18%; p=0.59).

Conclusion: This study of patients discharged from acute care hospitals found that, while one quarter reported being unready for discharge, these patients did not experience a higher rate of readmission or death within 30 days of discharge.

Lau, D., et al. Patient Reported Discharge Readiness and 30-Day Risk of Readmission or Death: A Prospective Cohort Study. **Amer J Med**. 2016, January; 129(1): 89-95.

MINDFULNESS-BASED STRESS REDUCTION VERSUS COGNITIVE BEHAVIORAL THERAPY FOR BACK PAIN

Low back pain (LBP) is a leading cause of disability in the United States. Of the nonpharmacologic treatments for persistent back pain, cognitive behavioral therapy (CBT) has demonstrated effectiveness. Mindfulness-based stress reduction (MBSR) is another mind-body approach which has been less studied for the treatment of LBP. This study assessed the efficacy of these treatment modalities for patients with chronic LBP.

Patients recruited were 20 to 70 years of age with nonspecific low back pain for at least three months. The subjects were randomized to receive MBSR, CBT or usual care. The interventions occurred two hours per week for eight weeks, with the MBSR program including an optional 6 hour retreat. Participants in both groups were given instructions for home practice. Interviewers, held blind to treatment, collected data by telephone at baseline and at four, eight, 26, and 52 weeks. Back pain related functional limitation was assessed by the Rowland Disability Questionnaire (RDQ). Secondary outcomes included depressive symptoms, anxiety, pain intensity, global impression of change, as well as physical and mental general health status.

The sample included 80 patients in each group, with a mean of 73 years of pain. At week 26, the percent of participants with clinically meaningful improvement in the RDQ differed between groups, MBSR 60.5%, usual care 44.1%, CBT 57.7%

(Continued from page 2)

Alicia Fuhrman, M.D.
University of Washington, Seattle, WA

*Bonnie Weigert, M.D.
David J. Schwanebeck, D.O.
University of Wisconsin, Madison, WI

*Anne Eliason, M.D.
Seth Haywood, M.D.
Michael Kwasniewski, M.D.
Rondy Michael Lazaro, M.D.
Olivier Rolin, M.D.
Jack Smith, M.D.
VCU, Richmond, VA

*Jeremy Hartman, M.D.
Michael Ahuja, M.D.
Joey Malbrough, M.D.
Washington University, St. Louis, MO

Executive Editor Emeritus
Donald F. Langenbeck, Jr., M.D.

Subscription Manager
Michael P. Burke, M.S.

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(p=0.04), with those randomized to receive MBSR more likely than those in usual care to show meaningful improvement. The overall difference among groups in clinically meaningful improvement in pain bothersomeness at 26 weeks was also significant, MBSR 43.6%, usual care 26.6%, CBT 44.9% (p=0.01). CBT was superior to usual care for both primary outcomes at 26 weeks but not at 52 weeks.

Conclusion: This study of patients with chronic low back pain found that mindfulness-based stress reduction is as effective as cognitive behavioral therapy, and superior to usual therapy, for pain reduction.

Cherkin, D., et al. Effect of Mindfulness-Based Stress Reduction versus Cognitive Behavioral Therapy or Usual Care on Back Pain and Functional Limitations in Adults with Chronic Low Back Pain. A Randomized Trial. **JAMA.** 2016, March 22/29; 315(12): 1240-1249.

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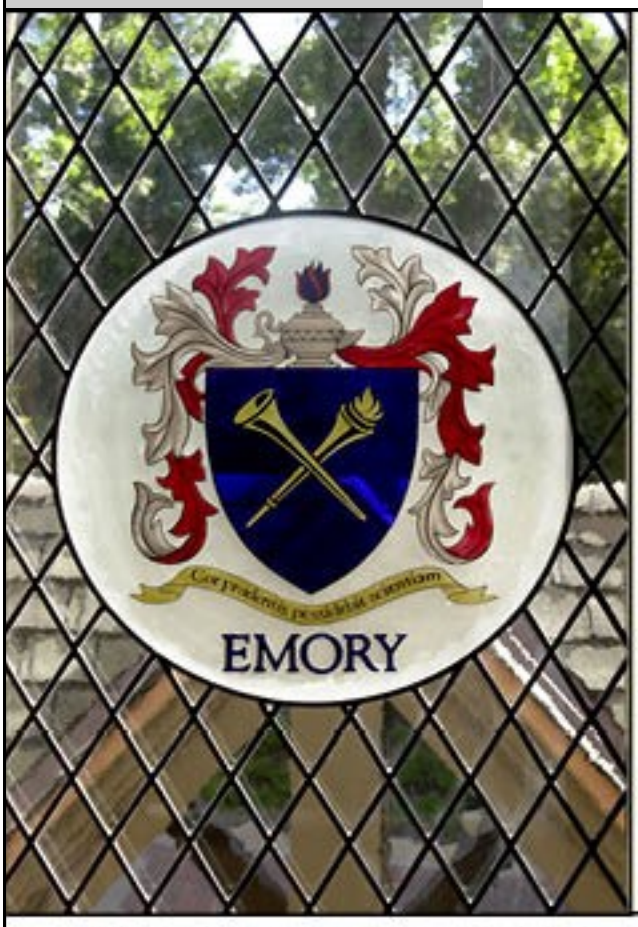

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