Abstracts

Spinal manipulation for low-back pain

Shekelle PG, Adams AH, Chassin MR, Hurwitz ER, Brook RH.
Annals of Internal Medicine 1992; 117:590–598.

Purpose: To review the use, complications, and efficacy of spinal manipulation as a treatment for low-back pain.
Data identification: Articles were identified through a MEDLINE search, review of articles' bibliographies, and advice from expert orthopedists and chiropractors.
Study selection: All studies reporting use and complications of spinal manipulation and all controlled trials of the efficacy of spinal manipulation were analyzed. Fifty-eight articles, including 25 controlled trials, were retrieved.
Data analysis: Data on the use and complications of spinal manipulation were summarized. Controlled trials of efficacy were critically appraised for study quality. Data from nine studies were combined using the confidence profile method of meta-analysis to estimate the effect of spinal manipulation on patients' pain and functional outcomes.
Results of data synthesis: Chiropractors provide most of the manipulative therapy used in the United States for patients with low-back pain. Serious complications of lumbar manipulation, including paraplegia and death, have been reported. Although the occurrence rate of these complications is unknown, it is probably low. For patients with uncomplicated, acute low-back pain, the difference in probability of recovery at 3 weeks favoring treatment with spinal manipulation is 0.17 (for example, increase in recovery from, 50% to 67%; 95% probability limits of estimate, 0.07 to 0.28). For patients with low-back pain and sciatic nerve irritation, the difference in probabilities of recovery at 4 weeks is 0.098 (probability limits, −0.016 to 0.209).
Conclusions: Spinal manipulation is of short-term benefit in some patients, particularly those with uncomplicated, acute low-back pain. Data are insufficient concerning the efficacy of spinal manipulation for chronic low-back pain.

Computed tomography of vertebral tuberculosis: patterns of bone destruction

Jain R, Sawhney S, Berry M.
Clinical Radiology 1993; 47:196–199.

A retrospective analysis was performed of CT scans of 30 consecutive patients with a clinical suspicion or diagnosis of spinal tuberculosis.

Four patterns of bone destruction were noted, namely, fragmentary, osteolytic, subperiosteal and well-defined lytic with sclerotic margins. The fragmentary type was most common (47%). Intervertebral disc destruction was always associated with contiguous vertebral body destruction. Associated paravertebral soft-tissue masses were seen in all patients. Epidural extension of disease was seen in 66% and showed a very good correlation with neurological signs on clinical evaluation. Bone fragments were detected in the epidural soft-tissue mass in 65% of patients with epidural extension of disease.

CT appearances of bone destruction are highly suggestive of tuberculous osteomyelitis in about half the patients.

Prior injury and motor vehicle crash as risk factors for youth suicide

Grossman DC, Soderberg R, Rivard FP.
Epidemiology 1993; 4:115–119.

We conducted a case-control study to determine whether adolescents and young adults who have been in a motor vehicle crash or hospitalized for unintentional and intentional injury are at greater risk for suicide. Cases were 700 Washington State residents age 16–35 with a driver's license who died of suicide during 1987–1989. Controls were 3,494 licensed drivers matched by age, sex, and zip code. Using two different databases, we were able to determine the past incidence of in-state injury hospitalizations and motor vehicle crashes for all subjects. Overall, the incidence of suicide was tenfold higher among those with a past hospitalization for injury. Many of these admissions were for suicide attempts [odds ratio (OR) = 56, 95% confidence interval (CI) = 27–120], but the risk of suicide was also higher among those hospitalized for unintentional injuries (OR = 5.0, 95% CI = 2.2–11.5) and assaults (OR = 4.5, 95% CI = 1.1–18). The relative risk for suicide was 2.7 (95% CI = 2.0–3.5) for those with prior injury as a driver in a motor vehicle crash and 2.9 (95% CI = 2.2–3.8) for those with involvement in a single vehicle crash. Many unintentional injury hospitalizations and a proportion of motor vehicle crashes in younger adults may represent unrecognized suicide attempts.

The clinical spectrum of unruptured intracranial aneurysms

Raps EC, Rogers JD, Galetta SL, Solomon RA, Lennihan L, Klebanoff LM, Fink ME. Arch Neurol 1993; 50:265–268.

Objective: A retrospective study was performed to delineate the clinical characteristics of symptomatic unruptured aneurysms.
Design: Patient histories, operative reports, and angiograms in 111 patients with 132 unruptured aneurysms were reviewed.
Setting: Tertiary care university hospital.
Patients: One hundred eleven patients with 132 unruptured intracranial aneurysms were studied. There were 85 women and 26 men, with a mean age of 51.2 years (age range, 11 to 77 years). Many patients were referred by community neurologists and neurosurgeons for further evaluation and neurosurgical management.
Results: Fifty-four symptomatic patients were identified. Group 1 (n = 19); mean aneurysm diameter, 2.1 cm) had acute symptoms: ischemia (n = 7), headache (n = 7), seizure (n = 3), and cranial neuropathy (n = 2). Group 2 (n = 35; mean aneurysm diameter, 2.2 cm) had chronic symptoms attributed to mass effect: headache (n = 18), visual loss (n = 10), pyramidal tract dysfunction (n = 4), and facial pain (n = 3). Group 3 (n = 57; mean aneurysm diameter, 1.1 cm) had asymptomatic aneurysms.
Conclusions: Acute severe headache, comparable to subarachnoid hemorrhage headache, but without nuchal rigidity, was associated with the following mechanisms: aneurysm thrombosis, localized meningeal inflammation, and unexplained. Unruptured aneurysms may be misdiagnosed as optic neuritis or migraine, or serve as a nidus for cerebral

thromboembolic events. Internal carotid artery and posterior circulation aneurysms were more likely to cause focal symptoms from mass effect than were anterior cerebral artery and middle cerebral artery aneurysms. Weeks to years may elapse before their diagnosis. The absence of subarachnoid blood does not exclude an aneurysm as a cause for acute or chronic neurologic symptoms.

Roentgenographic findings of the cervical spine in tension-type headache

Nagasawa A, Sakakibara T, Takahashi A.
Headache 1993; 33:90–95.

Roentgenographic studies were carried out on 372 patients with tension-type headache and 225 normal control subjects to determine relationships between straightened cervical spines, low-set shoulders, and cervical spine instability. A great majority of the patients with tension-type headache were found also to have straightened cervical spine. Patients with tension-type headache may have a restricted progression of the cervical spinal lordosis, which results in a straightened cervical spine. The flexor muscles of the head and neck prevent physiological lordosis of the cervical spine, and their sustained chronic contraction may be a principal cause of a straightened neck. The low-set shoulder was frequently seen in patients with tension-type headache, and it may result in traction of the brachial plexus, which gives rise to pain in the neck and shoulders. Cervical spine instability, on the other hand, was rather infrequent in patients with tension-type headache. Its relationship to tension-type headache is unclear and warrants further study. Our results suggest that both a straightened cervical spine and low-set shoulders may play an important role in the pathogenesis of tension-type headache and its accessory symptoms.

The risk of osteoarthritis with running and aging: a 5-year longitudinal study

Lane NE, Michel B, Bjorkengren A, Oehlert J, Shi H, Bloch DA, Fries JF. J Rheumatol 1993; 20:461–468.

Our purpose was to determine the 5-year longitudinal effects of running and aging on the development of radiographic and clinical osteoarthritis (OA) of the knees, hands and lumbar spine. Thirty-five running subjects and 38 controls, with a mean age of 63 years, were matched for age (± 2 years), years of education, and occupation; 33 matched pairs were constructed. All subjects underwent rheumatologic examination, completed questionnaires, and had radiographs taken of the hands, lateral lumbar spine, and knees in 1984 and in 1989. Five year radiographic results for both the runner and control groups showed OA progression for the knees, hands, and lumbar spine. In 1989, 10 (13%) of the 73 subjects fit American College of Rheumatology (ACR) criteria for clinical OA of the hand, and 9 subjects (12%) fit ACR criteria for OA of the knee. In summary, running did not accelerate the development of radiographic or clinical OA of the knees, but with aging, 13% of all subjects devleoped OA of the hands and 12% of all subjects developed OA of the knees.

Fibromyalgia and quality of life: a comparative analysis

Burckhardt CS, Clark SR, Bennett RM.
J Rheumatol 1993; 20:474–479.

The quality of life of women with fibromyalgia was explored and compared to the quality of life of women with rheumatoid arthritis, osteoarthritis, permanent ostomies, chronic obstructive pulmonary disease, insulin dependent diabetes, and healthy controls. The women with fibromyalgia consistently scored among the lowest in all domains measured. These results suggest that fibromyalgia may adversely affect quality of life to an extent not previously recognized.

Quantitative image analysis of vertebral body architecture –improved diagnosis in osteoporosis based on high-resolution computed tomography

Mundinger A, Wiesmeier B, Dinkel E, Helwig A, Beck A, Moenting JS. Br J Radiology 1993; 66:209–213.

71 women, 64 post-menopausal, were examined by single-energy quantitative computed tomography (SEQCT) and by high-resolution computed tomography (HRCT) scans through the middle of lumbar vertebral bodies. Computer-assisted image analysis of the high-resolution images assessed trabecular morphometry of the vertebral spongiosa texture. Texture parameters differed in women with and without age-reduced bone density, and in the former group also in patients with and without vertebral fractures. Discriminating parameters were the total number, diameter and variance of trabecular and intertrabecular spaces as well as the trabecular surface ($p < 0.05$). A texture index based on these statistically selected morphometric parameters identified a subgroup of patients suffering from fractures due to abnormal spongiosal architecture but with a bone mineral content not indicative for increased fracture risk. The combination of osteodensitometric and trabecular morphometry improves the diagnosis of osteoporosis and may contribute to the prediction of individual fracture risk.

Experimental determination of the subchondral stress-reducing role of articular cartilage under static and dynamic compression

Broom N, Oloyede A. Clin Biomech 1993; 8:102–108.

This paper describes a series of experiments investigating the ability of articular cartilage to act as a subchondral stress-reducing layer under both static and impact loading conditions. The cartilage was removed from its subchondral bone and rebonded to a rigid photoelastic substratum of known stress-optic properties. This allowed the shear stresses generated subchondrally by loads applied to the articular cartilage to be measured directly. The study demonstrated that while cartilage provides substantial subchondral protection under both statistically and dynamically applied load, the protection under static loading is greater close to the cartilage-subchondral boundary than under the equivalent dynamic load. This behaviour is interpreted in terms of the

contrasting deformation mechanisms operating in cartilage at low and high rates of loading. The capacity for potentially destructive stresses to be generated when rigid surfaces such as bone are loaded in direct contact is considerabale. The large amount of controlled, recoverable deformation associated with the compressive loading of articular cartilage enables it to redistribute these contact stresses and thus lessen the risk of damage occurring in the underlying bone. This study demonstrates quantitatively this important functional role of cartilage as a stress-reducing layer in the joint. Although substantial stress reduction is achieved by cartilage under both static and dynamic loading, the lesser degree of protection provided by cartilage under dynamic loading as compared with static loading to the same level may be relevant to the earlier suggestion by other workers that impulsive loading of the joint is responsible for promoting early vascular changes in the subchondral bone. These lead in turn to a remodelling and stiffening of the subchondral plate changes which are associated with the development of osteoarthritis.

A double-blind trial of the clinical effects of pulsed electromagnetic fields in osteoarthritis

Trock DH, Bollet JB, Dyer Jr RH, Fielding LP, Miner WK, Markoll R. J Rheumatol 1993; 20:456–460.

Objective: Further evaluation of pulsed electromagnetic fields (PEMF), which have been observed to produce numerous biological effects, and have been used to treat delayed union fractures for over a decade.
Methods: In a pilot, double-blind randomized trial, 27 patients with osteoarthritis (OA), primarily of the knee, were treated with PEMF. Treatment consisted of 18 half-hour periods of exposure over about 1 month in a specific designed noncontact, air-coil device. Observations were made on 6 clinical variables at baseline, midpoint of therapy, end of treatment and one month later; 25 patients completed treatment.
Results: An average improvement of 23–61% occurred in the clinical variables observed with active treatment, while 2 to 18% improvement was observed in these variables in placebo treated control patients. No toxicity was observed.
Conclusion: The decreased pain and improved functional performance of treated patients suggests that this configuration of PEMF has potential as an effective method of improving symptoms in patients with OA. This method warrants further clinical investigation.

Transcranial Doppler assessment of cerebral perfusion reserve in patients with carotid occlusive disease and no evidence of cerebral infarction

Chimowitz MI, Furlan AJ, Jones SC, Sila CA, Lorig RL, Paranandi L, Beck GJ. Neurology 1993; 43:353–357.

Using transcranial Doppler ultrasound (TCD), we measured bilateral middle cerebral artery mean blood flow velocities (MCAVs) before and 10 minutes after intravenous infusion of 1 gram of acetazolamide in 20 patients without cerebral infarction. Seven patients had normal carotid arteries (group 1), seven had unilateral internal carotid artery (ICA) stenosis ≥ 75% (group 2) and six had unilateral ICA occlusion (group 3). Before acetazolamide infusion, side-to-side differences in MCAV were 0.06 cm/sec in group 1 ($p = 0.98$) 4.3 cm/sec in group 2 ($p = 0.36$), and 15.0 cm/sec in group 3 ($p = 0.02$). Bilateral MCAV increased in all three groups after acetazolamide infusion, and the side-to-side differences in MCAV were 3.2 cm/sec in group 1 ($p = 0.40$), 11.4 cm/sec in group 2 ($p = 0.04$), and 27.6 cm/sec in group 3 ($p = 0.03$). Patients with carotid stenosis or occlusion and ipsilateral transient ischemic attacks (TIAs) had higher side-to-side differences in MCAV before ($p = 0.03$) and after ($p = 0.01$) acetazolamide than did asymptomatic patients with carotid disease. The association of impaired cerebral perfusion reserve and TIAs suggests that the TCD-acetazolamide test may enable identification of a subgroup of patients with carotid occlusive disease who are at higher risk for stroke.

Side posture manipulation for lumbar intervertebral disk herniation

Cassidy JD, Thiel HW, Kirkaldy-Willis WH. J Manipulative Physiol Ther 1993; 16:96–103.

Objectives: The objective of this article is to review the status of side posture manipulation for lumbar intervertebral disk herniation.
Data sources, study selection and data extraction: The data presented in this article are from our Back Pain Clinic at the Royal University Hospital and the articles cited are those which we feel are important in reviewing this subject.
Conclusions: The treatment of lumbar intervertebral disk herniation by side posture manipulation is both safe and effective. Further research is required to understand more fully the effects of this treatment on the intervertebral disk.

The relationship between the St. Thomas and Oswestry disability scores and the severity low back pain

Co YY, Eaton S, Maxwell MW. J Manipulative Physiol Ther 1992; 16:14–18.

Objective: To investigate the relationship between the two disability questionnaires and low back pain severity using the visual analog scale (VAS).
Design: One hundred sixty-two chiropractic patients with low back pain were interviewed using an interactive microcomputer system. The sources of data were the St. Thomas and Oswestry disability questionnaires for disability and a VAS for pain severity. All were inherent in the computer interview system.
Setting: The computer review system was set up in the Anglo-European College of Chiropractic outpatient clinic.
Patients, participants: One hundred sixty-two consenting new patients from the general community suffering from low back pain who attended the Anglo-European College of Chiropractic outpatient clinic were asked to participate.

Main outcome measures: Main outcome measures were the St. Thomas and Oswestry disability questionnaires for disability and the VAS for low back pain severity.
Results: There was a moderate correlation between the scores from the St. Thomas and Oswestry disability questionnaires ($r = .77$, $p < .0001$). A low but significant correlation score was found when comparing the St. Thomas and Oswestry disability score with pain severity (0.38, $p < .0001$, and 0.47, $p < .0001$, respectively.
Conclusion: The consequence of pain (disability) appears to have a weak relationship to pain severity. Despite the moderate correlation between the two disability questionnaires, it is suggested that they are not interchangeable.

Basilar artery migraine or cerebral vascular accident?

Cashley MAP. J Manipulative Physiol Ther 1993; 16:112–114.

There are no reports of misdiagnosis of postmanipulative stroke in the literature. This report discusses a case of basilar artery migraine that was misdiagnosed as such. The main diagnostic features of this rare condition are highlighted, as are the relevant differential diagnoses.

A comparison of outcome measures for use with back pain patients: results of a feasibility study

Triano JJ, McGregor M, Cramer GD, Emde DL.
J Manipulative Physiol Ther 1993; 16:67–73.

Objective: To compare the reliability, validity and change in patient clinical status over time with treatment for six potential outcome questionnaires in a defined population of patients.
Setting: Physician based, multidoctor teaching practice.
Patients: Three hundred thirty-five consecutive patients presenting with new complaints were solicited. One hundred eighty-six agreed to participate.
Interventions: The six questionnaires being studied were administered to each of the participants on three separate occasions. They were: a) prior to clinical evaluation for their chief complaint, b) immediately after clinical evaluation and before treatment and c) 6 weeks later.
Measurements: Each instrument was scored following the prescribed methods of interpretation from the original literature describing it. Results were submitted for analysis by Pearson correlation and two-way analysis of variance as appropriate.
Main results: Differences were found in the mean value of the modified Zung with respect to both gender and time. An unexpected drop in patients' somatic perceptions in association with the process of clinical evaluation was found for the Modified Somatic Pain Questionnaire. Overall, the Oswestry and Visual Analogue Pain Scale were the most reliable and responsive to clinical change for musculoskeletal disorders.
Conclusions: This investigation demonstrated substantial differences in the validity and reliability of commonly referenced self-administered instruments for quantifying patient perceptions of pain and disability. The Oswestry and Visual Analogue Pain Scale were both more reliable and valid than other instruments.

Uncommon origin for the iliopsoas sign

Balagué F, Anchisi S, Schumacher J-D, Hoogewood H-M, Waldburger M. J Rheumatol 1993; 20:510–511.

The term "iliopsoas sign" has different meanings in the medical literature. Among musculoskeletal disorders, iliopsoas bursitis is probably the most common cause of this clinical sign. Here we report an unexpected vascular pathology in a young man. The clinical manifestation on examination was an iliopsoas sign.

Focal headache during balloon inflation in the vertebral and basilar arteries

Nichols III FT, Maward M, Mohr JP, Hilal S, Adams RJ.
Headache 1993; 33:87–89.

Background and purpose: Headache may be seen in acute cerebrovascular disease. The significance of localized headache in association with vertebrobasilar disease has not been recognized.
Summary of report: We described a patient with a cerebellar arteriovenous malformation who underwent intravascular balloon occlusion of the vertebral and basilar artery. He developed reproducible patterns of referred pain with balloon inflation at specific sites.
Conclusions: Well localized head pain in the setting of acute stroke should alert physicians to the possibility of localized arterial injury. The pattern seen in this patient has been documented in experimental situations, and should be of use in the setting of acute stroke.

Coxiella (Q fever) – associated myelopathy

Hwang YM, Lee MC, Suh DC, Lee WY.
Neurology 1993; 43:338–342.

We described six men with a slowly progressive myelopathy characterized by asymmetric, incomplete spinal cord syndrome manifested with a thoracic sensory level, mild spastic paraparesis, and urinary incontinence. The spinal cord lesions were evident by MRI in four of them. *Coxiella burnetii* infection was confirmed in the blood of patients by immunofluorescence microscopic assay (IFA) and transmission electron microscopy (TEM). In two patients, we detected *C burnetti* by TEM and IFA using CSF from the patients inoculated onto fresh peripheral blood lymphocyte. Four patients, treated with appropriate antibiotics, responded either with partial resolution of symptoms or arrest of further neurologic progression. In three, the MRI lesions decreased in size.

The physical activity scale for the elderly (PASE): development and evaluation

Washburn RA, Smith KW, Jette AM, Janney CA.
J Clin Epidemiol 1993; 46(2):153–162.

A Physical Activity Scale for the Elderly (PASE) was evaluated in a sample of community-dwelling, older adults. Respondents were

randomly assigned to complete the PASE by mail or telephone before or after a home visit assessment. Item weights for the PASE were derived by regressing a physical acitivity principal component score on responses to the PASE. The component score was based on 3-day motion sensor counts, a 3-day physical activity diary and a global activity self-assessment. Test – retest reliability, assessed over a 3–7 week interval, was 0.75 (95% CI = 0.69–0.80). Reliability for mail administration ($r = 0.84$) was higher than for telephone administration ($r = 0.68$). Construct validity was established by correlating PASE scores with health status and physiologic measures. As hypothesized, PASE scores were positively associated with grip strength ($r = 0.37$), static balance ($r = +0.33$), leg strength ($r = 0.25$) and negatively correlated with resting heart rate ($r = -0.13$), age ($r = -0.34$) and perceived health status ($r = -0.34$); and overall Sickness Impact Profile score ($r = -0.42$). The PASE is a brief, easily scored, reliable and valid instrument for the assessment of physical activity in epidemiologic studies of older people.

Smoking, a cause of back trouble?

Br J Rheumatology 1993; 32:239–242.

Epidemiological studies strongly imply that smoking may be a risk factor for back problems. It has been speculated that this is due to frequent coughing, unhealthy life style or osteoporosis in smokers. All of these hypotheses, however, do not accord with the experimental evidence. A new theory is therefore proposed. It suggests that smoking leads to malnutrition of the disc which in turn renders it more vulnerable to mechanical stress. Malnutrition can be brought about by carboxyhaemoglobin formation, nicotine-induced vascoconstriction, arteriosclerotic vessel wall changes, impairment of fibrinolytic activity and changes in the flow properties of blood. The evidence supporting these pathomechanisms is discussed. Future studies should test the above hypothesis experimentally.

Diagnostic classification of patients with low back pain: report on a survey of physical therapy experts

Binkley J, Finch E, Hall J, Black T, Gowland C.
Phys Ther 1993; 73:138–155.

Background and purpose: A survey of expert orthopedic physical therapists was conducted to assist in the development of a classification system for patients with low back pain (LBP). The goal of the survey was to measure levels of agreement on labels and accompanying constellations of signs and symptoms for subgroups of patients with LBP.
Subjects: Twenty-four of the 30 expert orthopedic physical therapists who were originally contacted responded to the survey request.
Methods: A modified Delphi technique was used. The first stage involved a review of the literature and identification of 25 diagnostic classes of LBP. Experts were asked to rate the "appropriateness" of each diagnostic class for inclusion in a classification scheme. Clinical findings relevant to each diagnostic class were identified and rated on the degree of "essentialness" to that class.
Results: Three diagnostic classes – hypomobility dysfunction, nerve root adhesion, and sacroiliac hypermobility – were distinct in that the agreement criteria for the appropriateness of diagnostic classes as well as the surveyed essential signs and symptoms were met. Six of the 25 diagnostic classes did not meet the minimum levels required for agreement as appropriate diagnostic classes: facet syndrome, chronic pain behavior, muscle strain, iliolumbar ligament sprain, posterior ligament sprain, and myofascial dysfunction.
Conclusion and discussion: The importance of developing homogeneous subgroups of patients with LBP based on constellations of reliable clinical findings is emphasized.

Determining the incidence of different subtypes of stroke: results from the Perth Community Stroke Study, 1989–1990

Anderson CS, Jamrozik KD, Burvill PW, Chakera TMH, Johnson GA, Stewart-Wynne EG. Med J Aust 1993; 158:85–89.

Objective: To determine the incidence and case fatility of seven distinct subtypes of stroke in Perth, Western Australia.
Design and setting: A population-based descriptive epidemiological study.
Subjects: All residents of a geographically defined segment of the Perth metropolitan area (population 138,708) who had a stroke or transient ischaemic attack between 20 February 1989 and 19 August 1990, inclusive.
Main outcome measures: The following subtypes of stroke were classified according to standard clinical, radiological and pathological criteria: types of cerebral infarction, namely, large artery (thrombotic) occlusive infarction (LAOI), cerebral embolic infarction (EMBI), lacunar infarction (LACI) and boundary zone infarction (BZI); primary intracerebral haemorrhage (PICH); subarachnoid haemorrhage (SAH); and stroke of undetermined cause.
Results: Over the 18-month study period 536 stroke events were registered, of which 86% (95% confidence interval, 83%–89%) had a defined "pathological" diagnosis on the basis of computed tomographic scanning, magnetic resonance imaging or necropsy. Cerebral infarction accounted for 71% of cases (95% CI, 68–75%), PICH 11% (95% CI, 9%–14%) and SAH 4% (95% CI, 2%–5%). The 382 cases of cerebral infarction included LAOI (in approximately 71%), EMBI (15%), LACI (10%) and BZI (5%). While the incidence of all types of stroke increased with age, there were age and sex differences in their proportional frequency, management and prognosis: patients with PICH, SAH and EMBI were more likely to be admitted to hospital, and these conditions carried the highest early case fatality. Over all, the 28-day case fatality was 24% (95% CI, 20%–28%), but varied from 0 for LACI and BZI, to 37% (95% CI, 15%–59%) for SAH and 35% (CI, 23%–47%) for PICH.
Conclusions: In this study, we found considerable differences in incidence rates, the effect of age and sex on incidence rates, and prognosis for the different subtypes of stroke. Hospital-based studies are likely to be selectively biased by emphasising strokes that are severe and require

admission to hospital. These data have important implications in the design and evaluation of clinical trials of therapy for stroke.

Ascertaining the true incidence of stroke: experience from the Perth Community Stroke Study, 1989–1990

Anderson CS, Jamrozik KD, Burvill PW, Chakera TMH, Johnson GA, Stewart-Wynne EG. Med J Aust 1993; 158:80–84.

Objective: To determine the age and sex specific incidence, and case fatality of stroke in Perth, Western Australia.
Design and setting: A population-based descriptive epidemiological study.
Subjects: All residents of a geographically defined segment of the Perth metropolitan area (population 138,708) who had a stroke or transient ischaemic attack between 20 February 1989 and 19 August 1990, inclusive.
Main outcome measures: Definite acute "first-ever-in-a-lifetime" (first-ever) and recurrent stroke classified according to standard definitions and criteria.
Results: During the 18-month study period, 536 stroke events occurred among 492 patients, 69% of which were first-ever strokes. The crude annual event rate for all strokes was 258 (95% confidence interval 231–285) per 100,000, and the overall case fatality at 28 days was 24% (95% CI, 20%–28%). The crude annual incidence for first-ever strokes was 178 (95% CI, 156–200) per 100,000; 189 (95% CI, 157–221) per 100,000 in males and 166 (95% CI, 136–196) per 100,000 in females. The corresponding rate, age-adjusted to the "world" population, were 132 (95% CI, 109–155) for males and 77 (95% CI, 60–64) for females.
Conclusions: In contrast to mortality rates for ischaemic heart disease, the incidence of stroke in Australia appears little different from that for several other Western countries. For both males and females the incidence of stroke rises exponentially with increasing age. Although the sex-dependent difference in the risk of stroke is greatest in middle age, males are at greater risk of stroke even among the most elderly. To determine the incidence of stroke accurately, population-based studies of stroke need exhaustive and overlapping sources of case ascertainment. If only cases admitted to hospital had been used, we would have underestimated the rate of stroke among the most elderly by almost 40%. We estimate that approximately 37,000 people, about 50% of whom are over the age of 75, suffer a stroke each year in Australia.

External electrical stimulation and bracing for treatment of spondylolysis a case report

Pettine KA, Salib RM, Walker SG.
Spine 1993; 18(1):436–439.

Evidence indicates that osseous healing of acute spondylolysis can occur without surgery, although no existing data supports a particular regimen that optimizes healing. This article presents a case study of a 17-year-old athletic male student who presented with acute spondylolysis and who was treated with intermittent bracing and daily external electric stimulation. The patient was treated with a thoracic lumbar sacral orthosis to which an external bone growth stimulator was added. Computer tomography scans performed throughout the treatment process and described in this report illustrate the progressive healing of the right and left pars fractures.

Decision rules for the use of radiography in acute ankle injuries Refinement and prospective validation

Stiell IG, Greenberg GH, McKnight RD, Nair RC, McDowell I, Reardon M, Stewart JP, Maloney J. JAMA 1993; 269:1127–1132.

Objective: To validate and refine previously derived clinical decision rules that aid the efficient use of radiography in acute ankle injuries.
Design: Survey prospectively administered in two stages: validation and refinement of the original rules (first stage) and validation of the refined rules (second stage).
Setting: Emergency departments of two university hospitals.
Patients: Convenience sample of adults with acute ankle injuries: 1,032 of 1,130 eligible patients in the first stage of 453 of 530 eligible patients in the second stage.
Main outcomne measures: Attending emergency physicians assessed each patient for standardized clinical variables and classified the need for radiography according to the original (first stage) and the refined (second stage) decision rules. The decision rules were assessed for their ability to correctly identify the criterion standard of fractures on ankle and foot radiographic series. The original decision rules were refined by univariate and recursive partitioning analyses.
Main results: In the first stage, the original decision rules were found to have sensitivities of 1.0 (95% confidence interval [CI], 0.97 to 1.0) for detecting 121 malleolar zone fractures, and 0.98 (95% CI, 0.88 to 1.0) for detecting 49 midfoot zone fractures. For interpretation of the rules in 116 patients, K values were 0.56 for the ankle series rule and 0.69 for the foot series rule. Recursive partitioning of 20 predictor variables yielded refined decision rules for ankle and foot radiographs series. In the second stage, the refined rules proved to have sensitivities of 1.0 (95% CI, 0.93 to 1.0) for 50 malleolar zone fractures, and 1.0 (95% CI, 0.83 to 1.0) for 19 midfoot zone fractures. The potential reduction in radiography is estimated to be 34% for the ankle series and 30% for the foot series. The probability of fracture, if the corresponding decision rule were "negative," is estimated to be 0% (95% CI, 0% to 0.8%) in the ankle series, and 0% (95% CI, 0% to 0.4%) in the foot series.
Conclusion: Refinement and validation have shown the Ottawa ankle rules to be 100% sensitive for fractures, to be reliable, and to have the potential to allow physicians to safely reduce the number of radiographs ordered in patients with ankle injuries by one third. Field trials will assess the feasibility of implementing these rules into clinical practice.