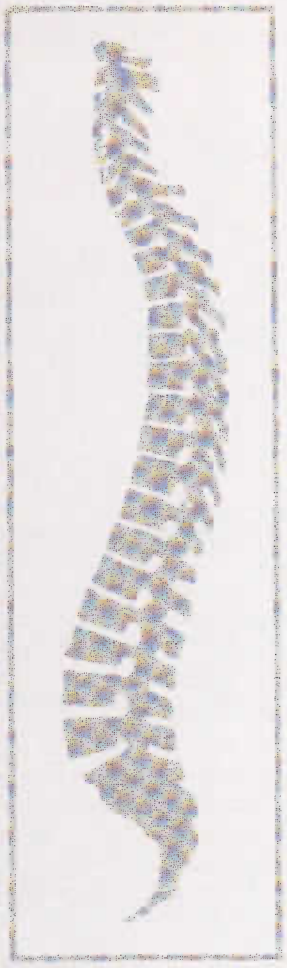



# THE CHIROPRACTIC REPORT

An international review of professional and research issues, published bimonthly.

Editor: David Chapman-Smith, LL.B. (Hons.) March 1990 Vol. 4 No. 3


## Professional Notes:

### New Studies on Cervical Adjustment

#### Increased Range of Movement

'Effect of Unilateral Spinal Adjustments on Goniometrically- Assessed Cervical Lateral-Flexion End-Range Asymmetries in Otherwise Asymptomatic Subjects', Nansel D, Cremata E et al (December 1989) J Manipulative Physiol Ther 12(6):419-427.

Last year (Chiropractic Report, March 1989 Vol 3 No. 3 para 16) we noted a Canadian study of 51 patients with unilateral neck pain which reported significant increased range of motion in 3 planes and reduction of pain following a single rotational cervical adjustment on the side of pain.

Here is another good new study looking at the effect of a cervical adjustment on range of motion - from Life Chiropractic College West, San Lorenzo, California.

• 67 asymptomatic adults were tested for lateral flexion of the cervical spine. End range of movement to left and right for each subject was measured by goniometer, and averaged from multiple measurements.

• An 8° variation in end range left and right, a statistically significant asymmetry, was found in 43 of the 67 subjects.

• These 43 were divided into 4 trial groups - those receiving no intervention (n 9 - Group 1), those receiving a sham adjustment (set up but no thrust, n 9 - Group 2), those receiving adjustment to the more restricted side (n 14 - Group 3) and those receiving adjustment to the less restricted side (n 11 - Group 4).

• Unlike many trials of manipulation, the technique –

*continued on page 3.*

## Sacroiliac Dysfunction

### A. Introduction

1. The sacroiliac (SI) joints, no strangers to controversy, are fast becoming respectable:

• Undermining much medical education and practice, 'Gray's Anatomy' has now reclassified the SI joint as a true synovial joint and acknowledges that it moves for everyone, not just expectant mothers.[1]

• At the most recent meeting of the International Federation of Manual Medicine, in London during September 1989, medical specialists from Belgium, Czechoslovakia, England, Germany, Netherlands and the United States presented papers affirming the importance of sacroiliac dysfunction in generating back and leg pain, and skilled manipulation in removing it.[2] This followed a number of medical articles during 1989 making the same points.[3,4]

• In 1987 the Canadian authors Bourdillon MD and Day MD, who share a chiropractic perspective on this matter, wrote:

*"The sacroiliac joint appears to be the single greatest cause of back pain. The range of motion is small and difficult to describe but, when normal joint play is lost, agonizing pain can be precipitated ... (the sacroiliac) joints are complex and not fully understood, but it is clear to the authors that they can have a profound effect on body mechanics ... anyone who still holds the view that these joints are immobile can never hope to achieve control of common back pain".*[5]

2. Palpation for SI dysfunction and specific manual adjustment to restore function has long occupied a central place in chiropractic management of a range of related spinal problems. In 1947 noted U.S. chiropractic educator Janse in his wise if now dated text 'Chiropractic Principles and Technic',[6] described a fundamental role for the SI joint in causing:

a) Buttock and leg (sciatic) pain.

b) Dysfunction throughout the spine from compensation (realignment and altered spinal mechanics) for pelvic dysfunction.

Your neck pain or headache, as medical manipulators now agree, may have SI dysfunction as its primary cause.

3. In Janse's time the Belgian chiropractor Gillet had developed a system of palpation to test for SI dysfunction which has now been shown to have good reliability[7,8,9] and has gained international acceptance in chiropractic.

The last 15 years has seen much new research and knowledge of the SI joint. A leading figure has been the Canadian chiropractic researcher Cassidy who is currently completing a Ph.D. doctoral thesis on fetal articular cartilage from the sacroiliac joint. He has made major contributions in:

• Understanding of gross and microscopic anatomy using autopsy specimens[10] and bipedal rats.[11]

• Epidemiology. A recent study, using Gillet's assessment methods, has shown that SI dysfunction and back pain are both surprisingly high in schoolchildren, and are linked. (29.9% of elementary schoolchildren (ages 6-12) and 41.5% of secondary schoolchildren (ages 12-17) tested positive for SI dysfunction.[12])

• Evidence of effectiveness of chiropractic manipulation for low-back and leg pain. His study of 283 patients presenting to a hospital clinic with chronic low-back and leg pain found that 117 (41.3%) had previously undiagnosed sacroiliac syndrome. Of these 117, who were totally disabled and had average duration of pain of approximately 8 years, 90% returned to normal activities of daily living after 2-3 weeks of daily chiropractic manipulations. This improvement was maintained at follow-up after one year.[13,14]

This issue of the Report reviews current knowledge on the sacroiliac joint - structure, movement, and chiropractic management.

### B. Structure

4. All loads from the spine, trunk and upper extremities, and all forces from the legs, are transmitted through the pelvis. The pelvic ring (see Fig. 1) comprises three bones - the two hip (innominate) bones and, centrally at the base of the spine, the sacrum. There are three joints:

a) The symphysis pubis. This is the joint between the two hip bones, at the centre and bottom of the pelvic ring. It is a thick mass of fibrocartilage.

b) The two sacroiliac (SI) joints. These are at 10 o'clock and 2 o'clock in the pelvic ring. Unlike the symphysis pubis, but like spinal and extremity joints, they are synovial joints - with surfaces bathed in fluid and designed for movement.

5. Reviewing the literature on the SI joint in the 1970s Bowen MD and Cassidy DC

found it "fragmentary, conflicting, and sometimes misleading"[10] and biased by emphasis on older autopsy specimens. Accordingly they undertook a detailed gross and microscopic study of SI joint anatomy, using 40 specimens representing fetal life to the 8th decade.

Their conclusions on gross structure, published in Spine in 1981[10] and generally accepted,[15,16] include:

a) The joint is C-shaped (auricular) with the convex surface forward - i.e. in reverse to the letter. (See Fig. 2). However it varies greatly in size, shape, contour, and the relative lengths of the top and bottom limbs.

b) The joints are vertical. A cross or horizontal section shows they lie at an angle to the body (oblique) rather than straight forward and back. (See Fig. 3). At the posterior the joint capsule blends into ligaments which, according to White and Panjabi,[17] are the strongest in the body.

c) The former view of many, that the SI is a temporary cartilage joint in due course replaced by bone (a synchondrosis), is wrong. As other anatomists have recently shown the SI is a true synovial joint (diarthrosis), and thus has:

- A joint cavity containing synovial fluid (surfaces were moist in all specimens examined, and drops of fluid were obtained and identified).
- Cartilage covering both bone surfaces, which are not attached.
- A joint capsule - outer fibrous layer, inner synovial membrane.
- Ligamentous connections between the bones (sacrum and ilium).
- Connections allowing movement between the bones.

(The current edition of Gray's Anatomy accepts this re- classification of the SI joint.[15])

d) While a synovial joint, the SI joint is distinct and unusual in that:

- Hyaline cartilage only covers one joint surface - on the sacrum. The iliac has a thin, fibrocartilaginous surface. This striking difference, which exists in the fetus and throughout life, leads to early changes in joint structure.
- At birth, although the two surfaces have completely different colour and texture, they are flat and smooth. During teenage years and by age 20, the iliac surface develops a heavy ridge that runs centrally along its entire length. The sacral surface develops a corresponding groove or depression to accommodate the ridge.

The ridge and groove become more marked through to a mature state in the forties.

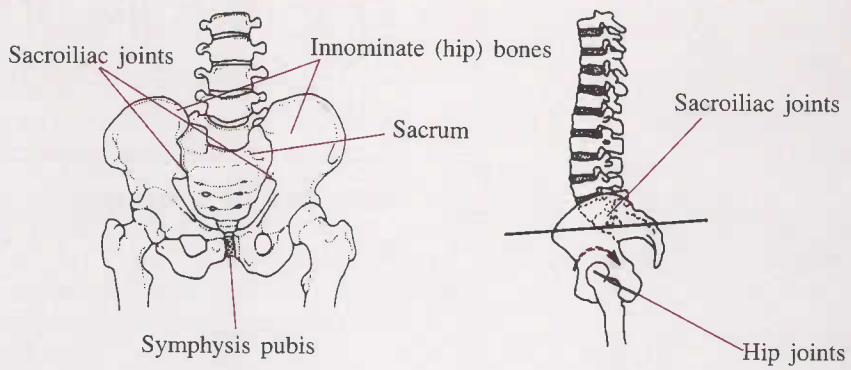
- Parallel to this development, there is unusually early degeneration - particularly of the thin, atypical iliac cartilage. By mid-20s all specimens studied showed surface roughness and formation of fibrous plaques.

The hyaline sacral surface remains clean at this stage, but in the 4th and 5th decades (i.e. by mid 40s) both surfaces are found to be rough, plaque formation and peripheral erosion is extensive, and the joint space typically contains "flaky, yellow, amorphous debris".

- As with all synovial joints, advanced degeneration is found in the 7th and 8th decades. Surface erosion sometimes exposes the bone beneath, making joint surfaces "totally irregular". Fibrous connections link the joint surfaces. Bone spurs are sometimes marked.

However in the 9 study specimens at this advanced age a true bony bridge (ankylosis) was found in only one, and there was movement - albeit restricted - in the other 8.

**Fig. 1 The pelvic ring**




A. Frontal view B. Side view

## Innervation

6. The SI joint has a well-innervated joint capsule. Dissection study shows nerve supply is from the L4 to S2 spinal cord levels, with some individual variation.[18]

Simple dysfunction of the SI joint cannot directly entrap or put pressure on the sciatic or other nerve pathways in the vicinity. This has been a major factor in traditional medical disbelief of the importance of the SI joints in pain syndromes. Explanation of referred pain, for example to the thigh or back, must rely upon reflex effects and the underlying effect of SI joint dysfunction on the correct function of other structures in the biomechanical chain. (e.g. hip joints, lumbosacral joint, piriformis muscle).

## Muscle

7. No single joint muscle crosses, or attaches to the SI joint. However it is surrounded by some of the strongest muscles in the body (e.g. psoas, quadratus lumborum, piriformis, sacral portion of the gluteus major) which place shear and moment loads on the SI joints as they contract.[16]

## C. Function

8. There have been many attempts to describe and measure SI joint motion - from manual stressing of 200 cadaveric specimens in 1924 to stereoradiographic and stereophotographic studies in recent times.[19] These studies have produced general agreement on two matters:

a) The joint moves.

b) The exact nature of this motion, and thus the precise biomechanical function of the joint, are not yet known. (The only exception is for the female in pregnancy - the hormone relaxin causes the sacroiliac ligaments to relax, broadening the pelvic canal, and allowing freer SI joint movement).

9. Study of movement has been particularly complex for the SI joint because of confusion until recently on its structure, its location deep within the body, a surrounding dense ligamentous complex, and powerful

*continued on page 5.*



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both set up and thrust – is described in detail. Adjustment was by one chiropractor, delivered between C5 and T1 at levels determined by palpation findings.

• Groups 1 and 2 - the controls - showed "virtually identical" asymmetry on retest.

• For those adjusted at the side of greater restriction (Group 3), there was a highly significant reduction of asymmetry on re-test.

• For those adjusted at the side of less restriction there was also a statistically significant decrease in asymmetry, but not as much. Most of the increased range of movement was to the more restricted side – i.e. opposite to side adjusted.

The report ends with a good analysis of hypotheses, and reports that further studies are underway to see if this early improvement of range of motion is maintained over time.

### Increased Pressure Pain Threshold

'Pressure Pain Threshold Evaluation of the Effect of Spinal Manipulation in the Treatment of Chronic Neck Pain: A Pilot Study', Vernon HT, Aker P et al (January 1990) J Manipulative Physiol Ther 113(1):13-16.

Here are interesting early results from an experienced research team at the Canadian Memorial Chiropractic College seeking objective means of measuring the effects of spinal adjustment. Research on larger numbers is proceeding, but in this pilot study:

• 9 subjects with "chronic mechanical neck pain syndromes" were randomly allocated to two groups - one group (n 5) receiving "a rotational manipulation" and one (n 4) receiving "an oscillatory mobilization".

• Pre and post scores were taken for ability to tolerate pressure (pressure pain threshold - PPT) over 4 standardized tender points in the paraspinal muscle surrounding the spinal lesion.

Measurement was by PPT meter. This device has a calibrated dial, similar to a clock face, attached to a plunger. Initially developed for other research purposes, it is attractive to chiropractic practice and research because it measures tenderness to pressure in the deeper myofascial structures.

• Those receiving chiropractic manipulation had a statistically significant increase in pain threshold levels, those in the mobilization/control group experienced no change.

### The Spine and Gynaecological Disorders

'Manual Medicine in Czechoslovakia' Janda V, Editorial, J Manual Medicine (1989) 4:126.

'Disorders of the Iliopsoas Muscle and its Role in Gynaecological Diseases' Dobrik I (November 1989), J Manual Medicine 4:130-133.

In Czechoslovakia the specialty of manual medicine has been markedly different from elsewhere in the world. Firstly, as neurologist Vladimir Janda of Prague says, "from the very beginning manual medicine was basically accepted by mainstream medicine ... it started on the university level and has spread from there". In addition the importance of manual medicine, as in chiropractic, was seen in terms of neurology rather than muscles and bones. Speaking at the European Chiropractors' Union Congress in Bergen, Norway in June 1989 Karel Lewit, the neurologist who has led the clinical research effort in the Prague school for many years, affirmed that the fundamental training for manipulation was in neurology.

The final issue of the Journal of Manual Medicine for 1989 is devoted to manual medicine research from Czechoslovakia. Dobrik's analysis of the relationship between spinal and gynaecological disorders is of particular interest.

• In a clear analysis he explains how the iliopsoas, internal genitalia, and other internal organs have "a common nervous and vascular supply" allowing a "mutual reflex influence", and describes the links each way between muscle disorder, spinal joint disorder and visceral disorder. (See Figures 1-2).

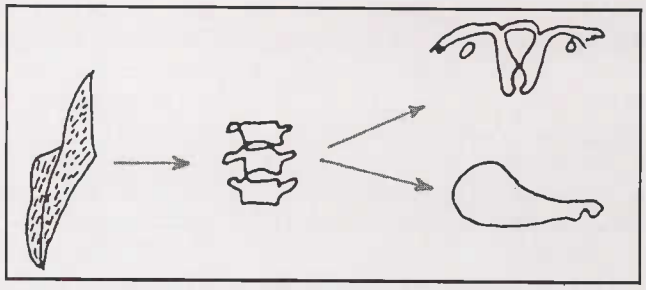

**Fig. 1** Schematic representation of the origin of iliopsoas genitocholecystic syndrome, e.g., long-lasting spasm of the iliopsoas muscle causes dysfunction of the gallbladder and anovulation

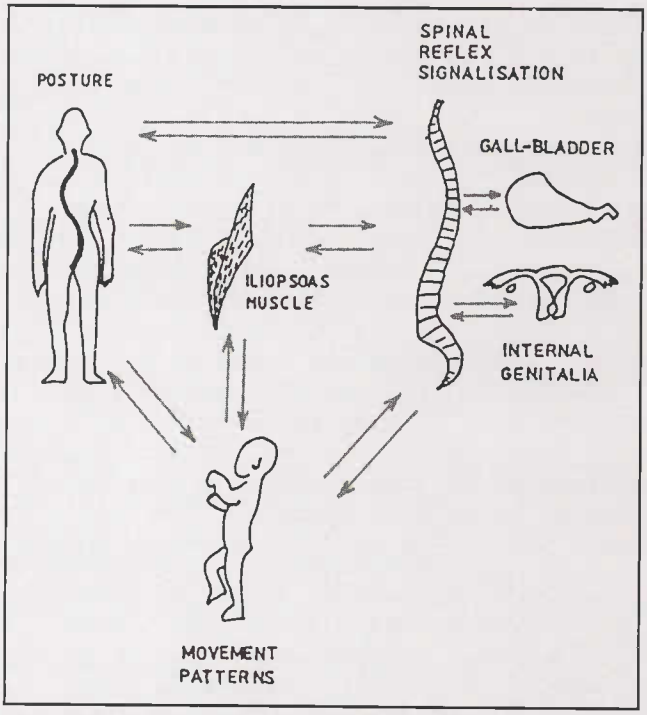


**Fig. 2** Schematic representation of the factors influencing the functional state of the iliopsoas muscle

• "Clinically one can observe cases in which functional disorder of the iliopsoas muscle is accompanied by a dysfunction of internal genitalia, or gynaecological disease is accompanied by the functional disorder of the muscle".

• "The condition of the iliopsoas muscle is the result of .... influences (including) the biomechanics of the lower extremities, the pelvis, the spinal column, one's posture, motion patterns ...". (The iliopsoas muscle directly, or via the fascia and ligaments, is in contact with the thoracolumbar spine, lumbosacral joint, sacroiliac joint, the hip bone, and the quadratus lumborum muscle).

• Via mutual reflex response gynaecological disorders, such as anovulation, and dysfunction of the gallbladder may be caused by spinal and/or muscular dysfunction.

From a patient's perspective, a strong case for gynaecologists and chiropractors respecting each other's skills and working in cooperation.

*(For fuller discussion of somato-visceral relationships see The Chiropractic Report March 1987 Vol. 1 No. 3)*

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### ERRATUM

In the last issue of this Report (January 1990 Vol. 4 No. 2 para 8) the reference to a study by Cherkin and MacCornack should have quoted "large and consistent differences between patients of family physicians and patients of chiropractors in their satisfaction with the information they received about their back problems" rather than "large inconsistent differences . . .". We regret the error.

## Wilk Case - AMA Loses Appeal

Wilk et al v American Medical Association, US Court of Appeals, Seventh Circuit Nos. 87-2672 and 87-2777, decision dated February 7, 1990 (49 pages).

On September 25, 1987 a US Federal Court in Chicago, having found that the AMA and various affiliated organizations had between 1966 and 1980 pursued an illegal conspiracy designed to contain and if possible eliminate the chiropractic profession, delivered the following historic and wide-ranging injunction:

*"The AMA, its officers, agents and employees, and all persons who act in active concert with any of them ... are hereby permanently enjoined from restricting, regulating or impeding, ... the freedom of any AMA member or any institution or hospital to make an individual decision as to whether or not that AMA member, institution, or hospital, shall professionally associate with chiropractors, chiropractic students, or chiropractic institutions"*.

Subsequent paragraphs in the injunction required the AMA to forward a copy of the order to all members and employees, and to publish the order in the Journal of the American Medical Association and otherwise index and publicize it.

The Court held that these steps were necessary, notwithstanding that the boycott had formally ended in 1980, since the AMA's extensive misinformation campaign portraying chiropractors as cultist and unscientific had strong continuing effects and had never been publicly retracted.

The AMA appealed all aspects of the decision and penalty, and particularly complained it should not be forced to send a copy of the Court order to all of its 230,000 members.

The appeal was argued on December 1, 1988, and the decision finally released last month on February 7, 1990. All of the AMA's arguments were rejected, and the District Court's decision affirmed in its entirety.

For a detailed analysis of the issues and evidence in the Wilk Case see the November 1987 issue of this Report (Vol. 2 No. 1). In summary the Court found that the AMA and affiliated organizations, such as the American College of Radiology and American College of Surgeons, had pursued an illegal conspiracy in contravention of anti-trust laws because of concern that individual MDs were choosing to practise in association with chiropractors, undermining the medical monopoly on hospital and health care services.

AMA activities included suppressing research favourable to chiropractic, undermining chiropractic colleges and postgraduate education programs, using new ethical rulings to prevent cooperation between MDs and chiropractors in education, research and practice, subverting a 1967 US government inquiry into the merits of chiropractic, and basing an extensive misinformation campaign against chiropractic on the calculated portrayal of chiropractors as 'unscientific', 'cultist', and having a philosophy incompatible with western scientific medicine.

The court held that, although AMA ethical changes technically ended the conspiracy in 1980, "the AMA has never acknowledged the lawlessness" of its "systematic long-term wrongdoing and intent to destroy a licensed profession".

## Nerve Root Compression

'Effects of Compression on Intraradicular Blood Flow in Dogs' Yoshizawa H, Kobayashi S et al (November 1989) Spine 14(11):1220-1225.

The structure of nerve roots is quite different from peripheral nerves - the nerve root has less protective coating and is bathed in cerebrospinal fluid (CSF).

This study from Japan looked at how lumbar nerve root compression causes radiating pain and the effects of mechanical compression on circulation within the nerve root - things which are "still not well understood".

The study used mechanical compression of lumbar nerve roots in dogs in vivo. The investigators report:

- Nutrients for nerve roots come from an ascending radicular artery and diffusion from the cerebrospinal fluid.
- Under compression with clips for 60 minutes there was a significant reduction in flow values. 60 minutes after release of clamps the blood flow was nearly restored, but not the cerebrospinal fluid flow.

## Movements of Whole Lumbar Spine and Lumbosacral Joint

'Three-Dimensional Movements of the Whole Lumbar Spine and Lumbosacral Joint' Yamamoto I, Panjabi MM et al (November 1989) Spine 14(11):1256-1260.

Yamamoto, Panjabi et al have measured normal three-dimensional movements of the lumbar spine, using whole lumbar spine and lumbosacral joint specimens from fresh cadavers. These movements have not been studied this directly and systematically before. They find:

- In flexion and extension, more motion took place at lower levels (L4-5, L5-S1) than at upper levels.
- In axial rotation least motion took place at L5-S1.
- In lateral bending least motion took place at L1-2, and biggest motion took place at L2-3. Similar motion was seen at each of L3-4, L4-5 and L5-S1.

## Low-Back Pain - What is Known, What is Not

'Research Perspectives in Low-Back Pain: Report of a 1988 Workshop' Frymoyer JW and Gordon SL (December 1989) Spine 14(12):1384-1390.

In May 1988 the American Academy of Orthopaedic Surgery, the North American Spine Society and the U.S. National Institutes of Health sponsored a meeting to review research on low-back pain - what is known, what is not.

Participants were the elite from North America, Europe and Australia. Dr. Reed Phillips, Director of Research, Los Angeles College of Chiropractic, represented the chiropractic profession. The meeting resulted in the text 'New Perspectives on Low-Back Pain' (February 1989) Frymoyer JW, Gordon SL (eds) AAOS Chicago. The December 1989 issue of Spine published a summary by the authors. Under the headings of epidemiology, clinical perspectives, basic science perspectives and recommended specific research projects, this represents the most authoritative current assessment of the state of the art. Conclusions include:

- Discectomy requires "rigorous analysis of success, failure and complications before widespread use can be advocated".
- "Chymopapain has undergone a wave of enthusiasm ... only to be followed by the identification of serious neurologic sequelae in a small but significant subset of patients. Currently this therapeutic agent is being used infrequently".
- "The major new information available" on ligaments, the role of which in low-back pain "is uncertain", is the "stress dependency of ligaments; stress deprivation causes biochemical and biomechanical changes similar to the degenerative process, whereas stress enhancements improve on the biomechanical properties".
- "The contribution of paraspinal muscles to low-back disease is an area that requires a great deal more study ... the role of abdominal muscle pressurization in protecting the spine remains controversial ... current evidence suggests it is less important than previously thought".
- The comparative role of the disc and facets remains unproven. New information shows that 20% of research specimens with facet arthropathy have morphologically normal discs so that "the traditional concept that facet joint degeneration follows disc degeneration has been challenged".

The weight of medical opinion remains that most of low-back pain (maybe 80%) relates to the disc.

- "In the broad overview all of this clinical information strongly suggests that restoration of activity is important to clinical symptom relief ... new prospective studies demonstrate that a more active approach to patients with low- back symptoms is followed by a more rapid restoration of function and work capacity. Conversely, prolonged inactivity, particularly bed rest, is followed by deleterious results".

Arne Christensen, Principal, Anglo-European College of Chiropractic, Bournemouth, England has announced that Her Royal Highness The Princess of Wales (known to the world as Princess Di) has become the Patron of the College.

Patronage is no mean thing in Europe, and this act bestows considerable honour and prestige on AECC and the profession. The British Royal Family, including Prince Charles, have long been outspoken in support of 'alternative medicine'. It is hard to conceive of a better patron than Princess Di - royal, philanthropic, glamorous, commanding worldwide respect and attention - and a person of exemplary bearing and posture.

**Main Article:** *continued from page 2.*

adjacent muscle groups that clearly affect joint mechanics but have no attachment to, or direct influence on, the joint. Comments are:

• The pelvic ring, chiefly through the strong diagonal sacroiliac ligaments, assumes a tight coiled position under weight-bearing. However during many postures, including normal standing or sitting, the SI joint ligaments are loose, and the sacrum 'floats' within the pelvic ring.

**Fig. 2** The sacroiliac joint

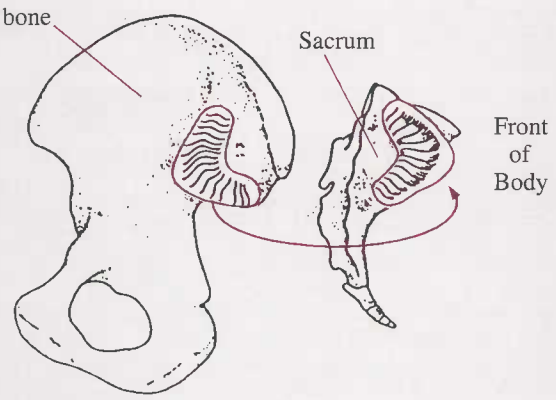
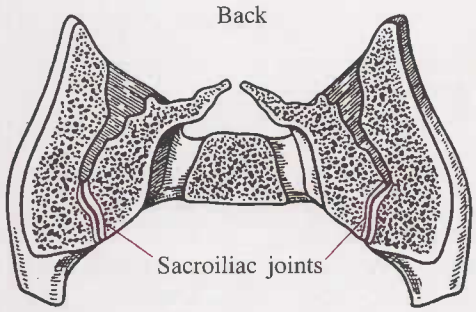



**Fig. 3** A horizontal section passing through the middle of the sacro-iliac




Movement of the shock-absorbing SI joints is multi-dimensional, and on examination with manual pressure the floating sacrum can be moved approximately 2 mm in any direction.[20]

• Until teenage years the SI joint surfaces are flat, allowing a gliding movement.

• After puberty the joint surfaces, as has been discussed, change. By age 15 there is a ridge line within the joint that alters joint mechanics, and the easy glide is replaced by a 'nodding' rotational movement along the crest of the ridge during walking or forward bending.

• By about age 40, as Bowen and Cassidy have demonstrated, 'nodding' motion is directed by a more pronounced ridge line. All ranges of movement are restricted by degenerative changes in the bone, joint capsule and ligaments.

• Beyond this little can be said. The axis of rotation, for example, is undetermined – chiropractic and medical studies have produced several competing explanations reviewed recently by Schafer DC and Faye DC[21]

## D. Chiropractic Management

10. For a detailed discussion see a recent text, for example 'Motion Palpation and Chiropractic Technic' by Schafer and Faye (50 pages on this topic).[22] In summary, management is based upon the following premises:

a) Dysfunction of the SI joint is common (traditionally called 'subluxation' in chiropractic - but because this is different from medical usage of the word, the generic term 'dysfunction' is used here).

• Studies have implicated sacroiliac disorders in 50- 70% of adults with low-back pain.[23,24]

• In a population of 1293 patients presenting to a university hospital pain clinic with chronic low-back pain Bernard MD and Kirkaldy-Willis MD found SI dysfunction to be the main problem in 23%.[25]

• Testing the whole population of an elementary school (n 265 - ages 6-12) and a secondary school (n 135 - ages 12-17) Mierau et al[12] found that 29.9% and 41.5% respectively had SI joint dysfunction.

A second blinded examiner, taking a history for current or previous low-back pain, found 22.8% of the elementary population and 33.3% of the secondary population complained of "recurring or prolonged low-back pain". This represented 26.3% of the entire student population (n 403 - ages 6-17). Of this 26.3%, 83.1% exhibited SI joint dysfunction.

b) SI dysfunction causes local mechanical disturbance and pain - pain in the buttock and radiating to the thigh. (With SI syndrome alone, there is tenderness over the back of the joint but not the mid-line of the lumbar spine.[14])

c) Dysfunction may play an important role in disturbances throughout the neuromusculoskeletal system, because of the pivotal position of the pelvis in the body. In 1947, using the language of his era, Janse DC observed:

*"A study of the architecture shows at a glance that the base of (the spinal) column is formed by the pelvis and that any irregularity there is bound to express itself in malpositions higher up. The chiropractor who keeps this thought in mind will be able, by correcting sacroiliac subluxations, to obtain much better results in adjustment of other vertebral subluxations".*[26]

• As a simple example of the relationship between the SI joint and other mechanical structures, a recent case report by Fickel DC, Ph.D.[27] explains how the objective disorder of a snapping or clicking hip was resolved by SI joint manipulation.

• Cassidy DC, Kirkaldy-Willis MD et al have now produced good evidence of the link between SI dysfunction and lumbar spinal dysfunction in the study already mentioned (see para 3).[13,14] 47% (48 of 102) of patients with disturbed lumbar spine mechanics were found to have previously undiagnosed sacroiliac dysfunction. All these patients had been disabled for many years (average 8 years) by low- back pain. There was an 88% success rate when chiropractic adjustment (manipulation) was directed to the lumbar vertebrae and SI joint.

### Diagnosis

11. The challenge is considerable, and diagnosis requires more understanding and skill than treatment.

a) The first aim is exclusion of other lumbar spine disorders. The possibility of serious pathology (e.g. infection, inflammatory arthritis and tumours) often requires x-ray examination and, on occasion, additional scans and tests.

There must then be consideration of other mechanical disorders of the lumbar spine - and pelvis - that may mimic or co-exist with SI strain. This requires careful examination, including palpation and neurologic testing for lower extremity reflexes, sensations and muscle power.

b) The only way of confirming SI dysfunction is through

skilled motion palpation and range of motion tests aimed at:

- Assessing joint mobility.
- Reproducing the pain by stressing the joint.

### Treatment

12. In the absence of exact knowledge of what amounts to normal motion in the SI joint in childhood and maturity, the clinical aim is to test for, then correct, restricted function in all directions.

The main chiropractic treatment approach, adjustment or manipulation, is highly effective in restoring movement and removing local and reflex pain but, with present knowledge, no one can state with certainty how these results are achieved. Cassidy DC and Kirkaldy-Willis MD suggest that likely mechanisms are:

- stretching the posterior muscles;
- breaking intra-articular adhesions;
- thereby relieving joint fixation with resultant stimulation of surrounding mechano-receptors.[28]

13. Two populations that should have more regular examination for SI dysfunction are pregnant women (because of increased sacroiliac laxity and motion) and children (because the SI joints are undergoing unusually rapid change and development, and are central to normal gait and muscle development).

## E. Conclusion

14. Prior to 1934, when Mixter and Barr discovered the disc herniation and diverted medical attention to the disc and surgical remedies for 40 years, the sacroiliac joint was thought to be the source of most low-back pain.[29,30] The "accepted opinion was that sciatica developed as a result of joint subluxation and subsequent irritation of the lumbosacral plexus lying across the sacroiliac joint".[19]

Chiropractic, undiverted since surgery is not part of its scope of practice, continued to focus on the importance of SI joint and pelvic ring function, seeing the pelvis as a central pivot in the neuromusculoskeletal system. Systems of diagnosis and treatment developed by the profession require further research, and will always remain open to some criticism in strict scientific terms since there are few objective tests that can confirm diagnosis.

However new knowledge about the structure and function of the SI joints, new controlled studies, and increasingly widespread clinical reports of relief of local and referred pain following manipulation, confirm the importance of normal SI joint function.

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