

# Acupuncture Treatment of Lumbar Disc Related Disorders

Wendy Longworth and Peter McCarthy

## Summary

*There is evidence that acupuncture may be of benefit to chronic sciatica sufferers even when they have failed to respond to previous treatment by drugs, bedrest, epidural injection, physiotherapy, osteopathy, chiropractic and surgery. The benefits that have been reported in small scale studies include: reduction in medication, better return to work figures and a decrease in the need for more invasive forms of treatment including surgery. The case for the efficacy of acupuncture in acute pain is weaker, but it may be that the poor methodology of the acute pain studies was to blame. Guidelines for more appropriate trial design are suggested.*

## Key words

*Acupuncture, Back pain, Clinical trials, Literature review, Lumbar disc disorder, Sciatica.*

## Introduction

The problem of low back pain (LBP) and sciatica is immense. NHS spending in the UK on the treatment of LBP disorders is increasing yearly and was estimated at £480 million in 1994 (CSAG report 1994). Seventy per cent of this cost has been attributed to treating the chronic 7% of patients who continue to experience symptoms despite a variety of conservative methods (Horal 1969; Kelsey *et al.* 1992). The highest proportion is spent on general practitioner visits (25% of the total) and in-patient care (44%); for a review see Moffett *et al.* (1995).

Acupuncture studies frequently claim high success rates in terms of pain relief with respect to sciatica (Longworth and McCarthy 1997). In this earlier review, we focused on 37 acupuncture studies spanning from 1947 to 1994, featuring 6414 patients with predominantly unilateral sciatica. Sources of reference included Medline and CATS/Amed databases, and manually searching foreign journals. The reader is referred to the original paper for an overview of results. This article intends to present additional material as well as to summarise those findings. It is not intended here to discuss the details in each paper relating to the methodology of trial design, as this was covered in the original paper. An exception to this is made to explain the inclusion of a high number of uncontrolled trials in the original review. Had there been sufficient controlled material in the literature

on sciatica and acupuncture, it would not have been necessary to do so. We only found 9 controlled trials featuring a total of 600 patients. The reason for the inclusion of the uncontrolled reports was to provide a thorough overview of the subject. Many of the uncontrolled trials featured patients who had suffered sciatica for months or years. Time and again, it was reported that acupuncture afforded symptomatic relief in patients who had failed to respond to a whole host of conservative and surgical procedures, thereby effectively acting as their own control, albeit without a formal control group. This article will highlight the need for fully controlled trials into the efficacy of acupuncture.

As sciatica is prone to remission, it is necessary before examining the effects of acupuncture to review the natural history of the condition. LBP has often been found to improve within 1-8 weeks with or without conventional treatments (for review see Kelsey *et al.* 1992). Gunn *et al.* (1980) found that 85% of LBP patients improved over 16 weeks. Even so, the LBP patient has been found to suffer recurrences (Von Korff *et al.* 1993).

The CSAG report (1994) found, however, that earlier estimates of recovery rates from LBP were over optimistic and had emphasised return to work. They concluded that:

- i. 50% of LBP attacks are more or less settled within 4 weeks,
- ii. 15-20% of LBP sufferers continue to have symptoms for at least 1 year,
- iii. 70% of people with LBP will suffer 3 or more recurrences, but that these may tend to settle over several years,
- iv. 20% of LBP sufferers, *i.e.* 5-10% of the population, will continue to have some degree of back symptoms over long periods of their life,
- v. 3-4% of the population aged 16-44 years and 5-7% of those aged 45-64 years will report back problems as a chronic sickness. A recent report (Croft *et al.* 1998) has found that claims of 90% recovery from back pain have failed to take account of patients who continue to experience problems but who do not return to see the general practitioner: as many as 75% of back pain sufferers were found to have some degree of back pain a year later.

With sciatica caused by lumbar disc disorders a presenting feature, Bush *et al.* (1992) found that

86% improved over 1 year. Note that this is a much longer time scale than with LBP alone. Indeed lumbar prolapsed intervertebral disc (PID) and sciatica have been found to account for much higher healthcare costs than other types of LBP disorders (CSAG report 1994; Engel *et al.* 1996). Cyriax (1982) noted that many cases with sciatic symptoms alone, and even those with neurological deficit, resolve spontaneously irrespective of treatment. With respect to posterolateral disc protrusions, the time course for recovery was said to be up to 12 months from the time that backache ceases and the protrusion causes sciatica alone. In contrast, disc protrusion centrally onto the posterior longitudinal ligament is said to produce LBP/sciatica that lasts for years, without the same natural resolution.

### Acute pain

All the studies in the original review featured wide ranging time scales: symptoms lasting from days to many years or even decades. The mean time since onset was, in the main, at least a year or two. Generally the results were reported for the whole group, which by definition led to outcomes being more pertinent to the chronic pain patient. However, a few reports analysed their results with regard to time since onset of symptoms, the outcomes being shown in *Table 1*.

Time since onset appeared the single most important factor, influencing the proportion of patients experiencing pain relief following acupuncture. Higher numbers of cures (patients rendered pain free immediately following treatment) were reported when the patient was treated soon after the appearance of symptoms. Under 2 weeks, the cure rate was said to be as high as 94%, with a further 6% of patients improved; superior outcomes were seen in those with symptoms lasting under 24 hours (Wang *et al.* 1991; Wu 1986). Of Liu's 956 patients with lumbar disc disorders, 75% had been symptomatic for less than 6 months. All of Wang *et al.*'s 118 lumbar disc patients had had symptoms for between 1 hour and 1 month. At between 3 days and one month (possibly around 2 weeks) there appeared a group of 2-4% of patients who were not at all responsive to acupuncture (*failed*), but still

86-88% of the patients were reported *cured* (Liu 1990; Wu 1986); 66% of Liu's patients were symptomatic for less than 1 month. At 1 month the cure rate fell to approximately 60%, with a further 20% of patients showing improvement (Jiang *et al.* 1984; Qi *et al.* 1985). Such figures are more impressive in view of the small number of treatments normally needed for acute sciatica (normally 2.5, but occasionally up to 10 or 15). From 1 month up to 6 months, the *cure* rate dropped to around 30%; this figure fell to 15-20% at 1 year (Qi *et al.* 1985).

The last 5 entries in *Table 1* show a number of figures not stated (NS). The overall results of the study by Qi *et al.* (1985) were 42.75% *cured*, 28.28% *marked effect*, 24.83% *improved* and 4.14% *failed*. This group of patients had had symptoms lasting from 2 days to 10 years. Unfortunately, when it came to breaking down the results with regard to symptom duration, only the cured patients were singled out as an example of how duration of the disorder affected results; therefore the patients experiencing improvement or a marked effect have not been featured in *Table 1*, as the exact figures were not reported. However, we can surmise from the results shown in our previous review (Longworth and McCarthy 1997) that only 10-30% of chronic patients fail to respond at all to acupuncture treatment.

Unfortunately all the reports in *Table 1* that provided a breakdown of figures as to the effectiveness of acupuncture versus duration of symptoms were uncontrolled studies of Oriental origin, primarily from China. Although the Oriental studies yield interesting information, they have serious scientific flaws and there tends to be a culturally biased overstatement of beneficial response. The lack of controlled evidence for the efficacy of acupuncture, with respect to the natural history of the condition, makes it impossible to evaluate how the outcomes following acupuncture relate to spontaneous recovery. It would be worth repeating their work in controlled Western trials, perhaps with respect to waiting list controls.

A major omission in most of the Oriental studies featuring acute pain was the complete lack of follow up. As a consequence, the nature of recurrences

Table 1

#### TIME SINCE ONSET VERSUS RESPONSE TO ACUPUNCTURE

Time since onset	Cured	Marked	Improved	No effect	Study
<2 weeks	94%	6%	0%	0%	Wu (1986)
24 hours-1 month	94%	0%	6%	0%	Wang <i>et al.</i> (1991)
3 days-1 month	88%	NS	10%	NS	Liu (1990)
<2 weeks	86%	12%	1%	1%	Wu (1986)
<1 month	63%	21%	NS	NS	Jiang <i>et al.</i> (1984)
<1 month	59%	NS	NS	NS	Qi <i>et al.</i> (1985)
>1 month	37%	44%	NS	NS	Jiang <i>et al.</i> (1984)
<3 months	30%	NS	NS	NS	Qi <i>et al.</i> (1985)
<6 months	33%	NS	NS	NS	Qi <i>et al.</i> (1985)
1 year	5-20%	NS	NS	NS	Qi <i>et al.</i> (1985)

Key: NS = Not stated

following acupuncture treatment remains unclear. Two studies claimed that recurrences of pain following acupuncture were fewer in acute (Wang *et al.* 1991) or in chronic cases (Leung 1979). These studies, however, failed to provide details of the method of determination. Despite serious shortcomings, there were a number of interesting clinical improvements noted after acupuncture that were expanded upon in the original review (Table 2).

**Table 2**  
**IMPROVEMENTS CLAIMED AFTER ACUPUNCTURE FOR ACUTE PAIN**

Straight leg raising increased
Analgesic medication reduced
Sedative medication reduced
Increased functional mobility: improved lumbar movements
Improved sleep
Pain levels reduced
Patients returned to work

As an example, Pontinen (1979) reported that 78% of acute patients (under 6 months) with LBP/sciatica had abandoned their drugs, with a further 17% reducing their medication, following a course of acupuncture treatment combined with transcutaneous electrical nerve stimulation (TENS). The majority of acute patients obtained satisfactory results from a total of 3 treatments given daily or on alternate days. It could be argued that the use of TENS makes evaluation of the true effects of acupuncture difficult. Clinically, however, acupuncture is often used in conjunction with other conservative treatments: as such there is validity in investigating their action together in the future.

Two of the studies in Table 1 contained results of acupuncture combined with either massage alone (Wang *et al.* 1991) or massage with manipulation (Liu 1990) which confound attempts to evaluate benefit due solely to acupuncture. All the other studies in Table 1 used acupuncture alone. It is possible that the results following acupuncture treatment would not be so good without the incorporation of manual therapy. In support of this was another Chinese report not included in Table 1 because it did not break down results with respect to time since onset. This study obtained high success rates in treating sciatica by acupuncture with massage (Xin 1991): 92% cured, 8% marked effect in 526 cases of sciatica where symptoms had been present between 2 days and 4 years. Manipulation alone has been found to be of benefit for some patients with acute pain (Jayson 1992). Manual therapists using both manipulation and acupuncture together often remark on the improved outcome of manipulation following combined treatment. Studies evaluating the effects of such combined therapies would be of value.

Even if there are acute patients who respond better to acupuncture combined with manual therapy,

there are still excellent outcomes reported following acupuncture without massage or manipulation. A case in point is the study by Ng (1979) discussed later as the results span both acute and chronic patients. In addition to this, there were other reports, such as that by Wu (1986), where the use of acupuncture alone yielded excellent outcomes in 400 sciatica sufferers. There are many examples of immediate relief ensuing from acupuncture treatment of sciatica. Wu (1986) described the case of a man who had suffered an 8 day history of intermittent burning pain in the left buttock, thigh, lower leg, and dorsum of the foot. The pain was acute, and the patient was unable to sleep properly and had difficulty walking. Trigger points were painful to palpation. His straight leg raising (SLR) was 20 degrees, and he had a reduced left ankle jerk. At the end of the first acupuncture treatment the patient noticed a marked reduction in pain and his SLR was 50 degrees. He required just 3 treatments, at the end of which he was pain free and returned to work. Follow-up over an unspecified period revealed no recurrence. Such uncontrolled case history outcomes were numerous: further examples were given in our previous review.

### **Chronic pain**

#### *Pain relief*

As time increased between onset of the disorder and treatment there were fewer cures reported, until at 1 year there were just 15-20%. The overall effect of acupuncture in chronic pain studies, that is of patients with symptoms which had lasted from 3 months to many years (Tables 1 and 2), was frequently around 80%, comprising a 15-20% cure rate, a further 30% marked effect and a further 20-30% improved; 10-30% of patients failed to respond at all to acupuncture treatment.

An example of the efficacy of acupuncture in chronic LBP/sciatica (over 6 months duration) was reported by Coan *et al.* (1980), in a study of 50 male patients. This randomised controlled trial showed clearly that pain relief following acupuncture was better than in non-treated patients. Overall 83% of acupuncture treated patients improved, whilst only 31% of non-treated controls improved. Furthermore, 25% of the non-treated group reportedly felt worse, whereas none in the treated group felt worse. Later the non-treated controls also received acupuncture and reported subsequent pain relief in 75% of cases; none felt worse. Both treatment groups reported improvement at 40 week follow-up in 58% of cases. The small numbers of patients such as those involved in this study leave it open to criticism that not enough patients were in the trial. Larger trials need to be designed to make the interpretation of results more conclusive. Furthermore, trial design needs to be improved. The study by Coan *et al.* (1980) featured patients recruited via newspaper announcements. It was not clear who examined the patients initially and at 10 weeks after they had entered the trial, and it was not stated whether the

examiners were blinded to the treatment, but no independent assessment was reported. Follow-up at 40 weeks was by postal survey.

In a further example, Gunn *et al.* (1980) studied 56 male patients suffering lower back disorders including sciatica, of at least 3 months duration. The patients had been referred to a pain clinic after failing to respond to a variety of conventional conservative treatments. The standard regime for such chronic cases included a rehabilitation programme of exercises, physiotherapy and occupational therapy. The addition of an average of 8 acupuncture treatments into this regime produced a marked improvement in terms of pain relief and functional outcome: 31% of the acupuncture treated group were rendered pain free following treatment, a further 35% showed a marked effect and 31% were improved; only 3% failed to experience any pain relief. In contrast, none of the non-acupuncture group were rendered pain free, only 15% experienced a marked effect, 44% were improved and 41% showed no effect. The pain relief and functional outcomes were statistically significant at discharge and at both early and late follow-up. Once again, lack of independent assessment was a cause for concern. The patients were all referred to the trial by a clinic physician, who continued to monitor and reassess the patients every week or two throughout the trial. It was not clear whether the physician was blinded to the intervention. Follow up at 12 weeks and beyond (12-61 weeks, average 27.3) was by telephone or letter, administered by the rehabilitation clinic's clerical staff.

Despite the shortcomings of even such controlled studies, a recent meta-analysis of acupuncture studies has concluded that acupuncture yields statistically significant results in chronic low back pain (Ernst and White, *in press*). The methodology of acupuncture trials has been under far greater scrutiny in recent years, which should lead to further improvements in the future, so that results can be analysed more accurately.

#### *Return to work*

The pain relief experienced by Gunn *et al.*'s (1980) acupuncture treated patients translated into better functional outcomes: 18 of the 29 acupuncture patients returned to their same or equivalent work, 10 to lighter work, and only 1 remained disabled. The non-acupuncture patients fared worse: only 4 of the 27 patients returned to their same occupation, 14 to lighter work, and 9 remained disabled.

#### *Operations averted*

Prior to acupuncture treatment, it was proposed that 5 out of the 29 in Gunn *et al.*'s (1980) acupuncture group of patients would need surgery. Following acupuncture treatment 3 of these operations were not necessary. Longworth (1991) also reported case histories where surgery was proposed for 2 male patients and subsequently cancelled following the successful use of acupuncture. The small numbers of

patients involved in the examples shown here make statistical analysis impractical. Nevertheless the implications should be investigated further in larger trials, as it is likely that a useful proportion of operations could be averted. Eleven thousand operations are performed annually in the UK for low back disorders (CSAG 1994). The long-term effects of conservative management have in the past been found equal if not superior to the results of surgery (Weber 1983). Even with improvements in surgical techniques, there is still a consensus towards conservative management where possible (Bush 1994). In cases where acupuncture was successful, the financial savings could be substantial given the high cost of each operation and subsequent treatment.

#### *Hospitalisation*

One report from China compared the results of acupuncture cases with those treated by herbs or acupoint injection (Li *et al.* 1989). The mean duration of sciatica, in this study of 101 patients, was 2 years. The control groups remained in hospital for 50-54 days, whereas the acupuncture treated patients were discharged sooner at 29 days. The reduction in necessity for in-patient care reflected better pain relief in the acupuncture group: 63% of acupuncture treated patients were rendered pain free and a further 33% showed a marked effect or improvement in symptoms. Only 25% of the herbal group and 32% of the acupoint group became pain free; a further 52-58% of these patients had some degree of pain relief. The quality of pain relief was worst in those treated by herbs: only 6% showed a marked effect, as opposed to 17% and 28% respectively for the acupuncture and acupoint groups. This example is given as a further demonstration that results following acupuncture may be better than the natural history amongst different groups of patients. It should also be stated that such long periods of bedrest would be considered unacceptable nowadays. Indeed, there is a move away from bedrest except in the most acute cases.

#### *Analgesic consumption*

Pontinen (1979) found 31% of chronic LBP/sciatica patients were able to come off all drugs following acupuncture, electroacupuncture and TENS, and a further 44% reduced their drug consumption. Although this was an uncontrolled report, the patients had failed to respond to a whole host of treatments such as physiotherapy, massage, traction, bedrest and even surgery before acupuncture treatment commenced. The patients had been referred by orthopaedic surgeons and neurologists. In addition an unspecified number of myelograms and EMG studies had been used to confirm the diagnosis. It is important that verification by scan is established for both diagnostic and research purposes. Nowadays MRI is the scan of choice, but radiculography and CT scans are still acceptable

(Bush 1994). It must be remembered that false positive results can occur with all forms of scan: for instance symptomless patients can show pathology such as disc bulges and even protrusions on MRI (Jensen *et al.* 1994).

In a controlled study, a 33-66% reduction in drug consumption was reported in acupuncture-treated chronic sciatica patients compared with 0-2% in non-treated controls; the reduction in analgesics, anti-inflammatory drugs and sedatives corresponded with a decrease in pain scores (Coan *et al.* 1980). Unfortunately, this study grouped all medication together and provided no further details on the reduction in different types. Such results are important in the light of the possible side effects of drugs, in particular the adverse effects of anti-inflammatory medication on the stomach when taken long-term.

#### Severity of symptoms

Arseni *et al.* (1989) found a correlation between severity of symptoms and outcome. This trial, of 50 male LBP patients whose symptoms had been present for between 3 months and 2 years, concluded that patients with less severe presentations fared better in terms of the quality of pain relief experienced after 10 acupuncture treatments (Table 3). Unfortunately, the categories of affliction (*irritation, compression, interruption/neurological phase*) were not clearly defined, although they were apparently related to the level of SLR restriction as well as other clinical findings. Some of the patients in this study had neurological signs. The study was unusual in that it targeted patients who responded to acupuncture with some sort of *needling sensation* and excluded patients who failed to respond to acupuncture in such a way.

It should be noted that according to the natural history of sciatica, a substantial limitation of SLR predisposes toward surgery; however, increased limitation of SLR is also a statistically significant predisposing factor toward the resolution of

intervertebral disc pathomorphology (Bush *et al.* 1992). The mechanisms involved are discussed later in the *Neurological outcome* section.

#### Recurrence of symptoms

It has been reported that the recurrence rate of sciatica cases, with symptoms lasting between 7 days and 2 years (average 108 days), is 8.5% over an unspecified time frame; no relationship was found between length of symptom duration and recurrence (Jiang *et al.* 1984). A similar rate (8.3%) was reported by Leung (1973), where patients had had symptoms for an unspecified period of time. It is interesting that Cyriax (1982) reported that the symptoms in 40% of sciatica cases and 44% of LBP cases would recur if treated by bedrest alone in patients followed up for 3 years. It should be noted (Table 10) that the recurrence rate in no-surgery cases was better than in post-operative patients (Leung 1973).

#### Influencing factors

##### Type of onset

Ng (1979) studied 188 LBP patients, of whom 72% had sciatica. Those with gradual onset fared slightly better (75% having a good response) than those of sudden onset (67%), however the author concluded that the difference was not significant. In reports of Chinese origin, it was often found that patients whose symptoms had been set off innocuously, and attributed by the patient to being exposed to a draught or dampness or having a cold, fared best (Jiang *et al.* 1984). These would include patients with activated trigger points who would be expected to fare well (Baldry 1993). However, those attributed to direct injury did not respond so well in a number of reports from Oriental sources.

##### Type of treatment

Almost all the studies used standard acupoints commonly associated with the treatment of LBP such as BL.25 (3cm lateral to L4/5), BL.54 (popliteal fossa) and BL.60 (midway between the achilles tendon and lateral malleolus) for LBP radiating posteriorly down the back of the leg in an L5/S1 distribution, or points such as GB.30 (buttock) and GB.34 (anterior and inferior to the head of the fibula) for leg pain referred laterally in the L4/5 dermatome, together with the tender (*ah shi*) points for either. One report (Pei 1994), not included in our original review, claimed superior results from using *Huato Jiaji* points on sciatica cases of 1 week to 3 years' duration (Table 4). The *Huato Jiaji* points are

Table 3  
PAIN RELIEF RELATED TO INITIAL SEVERITY\*

Severity	n	Very good	Good	Fair	Failed
Irritation	20	40%	30%	15%	15%
Compression	22	9%	41%	14%	36%
Interruption/ neurological phase	8	0%	25%	25%	50%

\*Arseni *et al.* (1989)

Table 4  
OUTCOME USING DIFFERENT POINT LOCATIONS\*

Points used	n	Cured	Marked	Improved	Failed	Total benefit
<i>Huato Jiaji</i>	84	85.7%	9.5%	2.3%	2.3%	97.6%
BL, GB, <i>Ah shi</i>	84	72.6%	7.1%	3.5%	16.6%	83.3%

\*Pei (1994)

located paravertebrally, approximately 1.5cm from the midline, halfway between the midline and the inner *Bladder* meridian points such as *Bladder 25*. The *Huato Jiaji* group were treated using from 3 to 21 sessions (average 14). However the control group needed more: from 10 to 32 sessions (average 23).

Distal points are commonly used in China to treat very acute symptoms, but after the first few treatments they frequently revert to using points on the back. Virtually all of the reports in our original review featured patients treated using points on the low back and legs, even for acute in-patients. Exceptions to this included the following:

The only study to use points on the arms exclusively throughout the treatment period was the only one with very high numbers of treatments in some cases, up to 60 or 70 sessions in a minority of refractory cases (Dou 1991). Although the majority of reports from China featured the use of standard LBP and leg points, there were a smaller number involving arm points where treatment was deemed successful; in general this referred to acute cases. Song (1993) used a single acupoint on the arms to treat acute patients. The results were much improved by getting the patient to exercise whilst acupuncture was being performed (see section on combination of acupuncture with conservative treatment), while poorer results were found using acupuncture alone.

It has been claimed that low frequency electroacupuncture is the best treatment modality for chronic nociceptive LBP (Thomas and Lundberg 1994). Not all authors used electroacupuncture on their chronic pain patients, preferring manual needling except in perhaps a minority of cases (Gunn *et al.* 1980; Leung 1973). Those authors maintained that attaining appropriate needling sensation (*de qi*) was the most important factor in achieving results. Increasing the frequency of treatment was also noted to improve outcome (Pontinen 1979). One report warned against *hyperstimulation*, where it is possible to exacerbate a painful disorder by using needling that the patient finds too painful; this was said to occur more readily with the use of electroacupuncture (Pontinen 1979).

Further research needs to be carried out into different acupuncture methods and their effect on symptoms. Moxibustion (heating acupoints using moxa: dried leaves of *Artemisia sp.*) is often used in chronic or arthritic LBP patients in traditional Chinese medicine (TCM), but none of the trials in our original review featured its use for patients with sciatica. Concerns over the danger of burns, as well as dislike of the pungent aroma of burning moxa, has led to infra-red devices being developed to heat acupoints to 43°C for short intervals to mimic the effects of moxa.

A number of reports claimed that the addition of acupuncture into the standard repertoire of conservative treatments improved outcome (Gunn *et al.* 1980; Kajdos 1973). Conversely, it has been proposed that the addition of conservative treatment improves the outcome of acupuncture (Maruyama

1984; Wang and Wang 1986). Bedrest for acute hospitalised lumbar disc patients (Wang and Wang 1986), and manipulation (Kajdos 1973), have been claimed to improve outcome. Song (1993) found that initial response to acupuncture treatment was better in cases of LBP that included sciatica when exercise was performed during and after the treatment (*Table 8*).

One study (Song 1993) that did not appear in our original review compared the results of one session of acupuncture with a session of acupuncture combined with exercise (*Table 5*). The results appear to have been reported immediately after treatment with no follow-up, so it is impossible to evaluate the long-term effectiveness. They concluded that the effects of acupuncture on acute back pain are greater when the patient performs movement whilst under acupuncture. The technique for doing this was to use a single acupuncture point on the hand or face.

Table 5

EFFECT OF EXERCISE DURING ACUPUNCTURE\*

	Cured	Marked	Improved	Failed
Acupuncture + exercise	62%	25%	11%	2%
Acupuncture alone	16%	26%	40%	18%

\*Song (1993)

The clinical experience of manual therapists generally supports the use of acupuncture in conjunction with conventional therapies rather than in isolation. In the personal experience of the authors:

- i. If suitable for mobilisation or manipulation then the patient should receive this treatment in addition to acupuncture. The results of both combined seem to be better than either treatment used in isolation.
- ii. Some respond very well to manual therapies alone. However the proportion of patients with an excellent response seems to increase if acupuncture is also used in the same treatment session.
- iii. Acupuncture alone is useful in acute back pain that makes it difficult for a patient to move, sit, turn over *etc.*, if positioning for manual therapy is awkward.
- iv. Acupuncture alone is useful in instances where contraindications to manual therapy exist. This may be especially so with respect to sciatica.
- v. In hyperacute patients the pain relief from acupuncture tends to be greater after 2 or even 3 sessions. Even if treatment is carried out daily this can leave the patient in pain for 2-3 days. Here the use of a home TENS allows the patient to access faster initial pain relief.

A further study which did not involve massage and manipulation found differences in response to acupuncture according to length of symptom duration (Ng 1979). It cannot be said that the chosen group was an easy patient population. More than

half were referred to the medical acupuncturist by general practitioners or orthopaedic surgeons; the majority had not been helped previously by a whole range of conventional treatments such as manual therapies; an unspecified number (*quite a few*) had had previous surgery. The average number of treatments was 8.4 (range 2 to 22). Unfortunately, the results appear to have been reported immediately following treatment with no follow-up. It was, however, stated that the 72% of patients that had *good* results (defined as pain free and full mobility restored) returned full-time to their normal occupation. A number of factors may have contributed to the excellent outcome:

- i. The patients received other treatments: ultrasound, acupoint injections of vitamin B12, and advice on rest, diet and exercise.
- ii. The duration of the treatment was 25-40 minutes.
- iii. Tender (*ah shi*) points were used in addition to traditional Chinese points.
- iv. Treatments featured a wide range of acupuncture points including those of the Bladder and Gall bladder channels, the central Governing vessel (*Du*) channel (points located in the midline over the supraspinous ligaments), and ear points.
- v. Needling sensation (*de qi*) was attained.
- vi. A periosteal pecking technique was used in some cases around the sacro-iliac joints and greater trochanters. This technique can be painful, although in this instance the stimulation was not reportedly very painful; instead the needling merely produced a strong sensation of *de qi*, resulting in immediate relief from pain and spasm.
- vii. Electro-acupuncture was used for difficult cases. Stimulation was with the electro-acupuncture machines *G6805* (known to give a dense disperse current: *i.e.* intermittent high and low frequencies interspersed), *711*, *713* and *WQ-10A*, using unspecified frequencies.

**Table 6**  
**RESULTS FOLLOWING ACUPUNCTURE, ADVICE AND EXERCISE\***

Symptom duration	n	Good	Fair	Poor
<1 month	21	18 (85%)	2	1
1-6 months	24	20 (83%)	4	0
6 months-1 year	24	16 (66%)	5	3
1-5 years	60	42 (70%)	14	4

\*Ng (1979)

It is interesting that patients who have not undertaken any previous form of conservative treatment have been found to respond best to acupuncture treatment (Ng 1979; Longworth and McCarthy 1997). This may well reflect the symptom severity of those requiring conventional treatment in the first instance. It is surmised that acupuncture works best in patients with moderate pain. Hyperacute patients, such as those requiring in-patient care, may respond less well (more slowly). Even so, the response to acupuncture (combined with medication and rest) may well be superior to the standard treatment without acupuncture for at least a proportion of patients in this category. A personal observation is that acupuncture may shorten the period of hyperacute symptoms and thus, with the improvements obtained, the need for more invasive treatment diminishes. There are also some patients within the very acute group who have an excellent response to acupuncture treatment, being dramatically improved within a minimum number of treatments.

#### Type of disorder

It is probable that the type of disorder influences the outcome following acupuncture treatment. Leung (1973) found that those with lumbar disc disorders fared better than those with osteoarthritis (OA); patients with OA responded slower (Tables 7 and 8).

**Table 7**  
**NUMBER OF TREATMENTS TO START OF IMPROVEMENT WITH ACUPUNCTURE\***

Disorder	n	Number of treatments					
		1	2	3	4	5	6
Herniated disc	56	62.5%	25.0%	3.5%	5.5%	0%	3.5%
Osteoarthritis	29	31.1%	34.6%	10.3%	10.3%	10.3%	3.4%

\*Leung (1973)

**Table 8**  
**NUMBER OF TREATMENTS TO FULL IMPROVEMENT FOLLOWING ACUPUNCTURE\***

Disorder	Number of treatments									
	1	2	3	4	5	6	7	8	9	10+
Herniated disc	3.5%	28.5%	19.6%	23.2%	5.5%	1.7%	1.7%	3.5%	0%	16.3%
Osteoarthritis	0%	15.7%	15.7%	6.8%	6.8%	10.3%	3.4%	3.4%	3.4%	34.5%

\*Leung (1973)

Table 9

## EFFECT OF 1 SESSION OF ACUPUNCTURE PLUS EXERCISE ON DIFFERENT PRESENTATIONS OF LBP/SCIATICA\*

Disorder	n	Cured	Marked	Improved	None	
Unilateral LBP	461	64.0%	25.2%	8.2%	1.5%	
Unilateral LBP radiating to leg	136	52.9%	27.9%	14.7%	4.4%	
Midline LBP	265	61.9%	22.6%	12.8%	2.6%	
Midline LBP + paravertebral	138	63.3%	21.7%	13.0%	1.4%	
<b>Total</b>	<b>1000</b>		<b>61.9%</b>	<b>24.9%</b>	<b>11.0%</b>	<b>2.2%</b>

\*Song (1993)

Extensive bony changes have been associated with poorer response to acupuncture in neck disorders (Agrawal and Ravishankar 1981). It has previously been noted that conditions where spasm is present are those that respond most favourably to acupuncture treatment (Lundeberg *et al.* 1988). Perhaps this explains the success seen after acupuncture with respect to LBP and sciatica. The information in *Tables 7 and 8* could be used as a guide to the number of treatments needed in future trials. The majority of the failures (10+ treatments) in the herniated disc group were patients who had previously undergone surgery. Unfortunately there were no further details with respect to symptom duration.

It would be expected that as the natural histories of LBP and sciatica are different so would be their response to acupuncture. However, reports that have analysed the effects of acupuncture on LBP and sciatica (Song 1993) appear to indicate no difference. There were some difficulties of translation in this paper, in particular it was not entirely clear if patients in the *unilateral LBP* and the *midline LBP plus paravertebral pain* groups had indeed no radiating pain down the leg, but this appeared to be the case from the descriptions (*Table 9*).

Ng (1979) also found little difference in outcome following acupuncture between patients with LBP and those with sciatica which had lasted from 2 days to 35 years (mean 5 years). Further research would be useful in this area, as conventional treatments generally take longer to affect cases of sciatica than LBP alone (CSAG 1994). It would also be useful to consider a comparison of the outcomes following acupuncture treatment of patients with sciatica alone as opposed to those with LBP and sciatica. Patients with posterolateral disc herniation causing sciatica alone are in the category of patients likely to undergo spontaneous recovery (Cyriax 1982); it may be that the use of acupuncture accelerates this process.

Being female statistically predisposes the sciatica sufferer toward surgery (Bush *et al.* 1992), but there is no suggestion in acupuncture literature that the sex of the patient influences outcome in LBP or sciatica.

**Results following surgery**

It is not intended here to reproduce tables showing response to acupuncture following surgery, as they have been documented elsewhere (Longworth and McCarthy 1997). That review showed that the results of acupuncture following laminectomy are generally better than those following spinal fusion (Kim and Yount 1974; Leung 1973). This was with respect to the initial speed of response, the outcome of treatment, and the nature of recurrences. The laminectomy patient standardly experiences some degree of pain relief within 3 sessions, is pain free within 8 sessions, and has a recurrence rate of 16% (Leung 1973). The spinal fusion patient often takes at least 8 treatments to show some effect; 50% of the patients require more than 10 treatments, and there is a relapse rate of 50%.

It has also been shown that there is a relationship between the number of acupuncture treatments and the onset of symptomatic relief. In general, the speed of response (Leung 1973) is related to whether or not the patient has had surgery (*Tables 10 and 11*). Quality of pain relief (Spoerel *et al.* 1976) is shown in *Table 12*. There was a proportionate decrease in the success rate of acupuncture according to the increase in number and complexity of operation(s). The response from post-surgical patients is different from the non-operated acute or chronic pain patient, and as such the results of this group must be considered separately. The pathophysiology of the surgical patient will be different from that of non-operated individuals. This highlights the need for clinical studies of acupuncture in the post-surgical patient.

Table 10

## NUMBER OF TREATMENTS TO START OF IMPROVEMENT WITH ACUPUNCTURE\*

	n	Number of treatments						
		1	2	3	4	5	6	7
No surgery	36	72%	25%	3%	-	-	-	-
Surgery	20	45%	25%	5%	15%	0%	5%	5%

\*Leung (1973)

Table 11

## NUMBER OF TREATMENTS TO FULL IMPROVEMENT FOLLOWING ACUPUNCTURE\*

	Number of treatments											
	1	2	3	4	5	6	7	8	9	10	10+	Relapse
No surgery	5.5%	33.3%	25%	22.3%	5.5%	2.8%	-	2.8%	-	2.8%	-	8.3%
Surgery	-	15%	10%	25%	10%	-	5%	5%	-	10%	20%	40%

\*Leung (1973)

Table 12

## PAIN RELIEF FOLLOWING ACUPUNCTURE IN CHRONIC LBP/SCIATICA\*

	n	Marked	Improved	Transient	None
No surgery	31	42%	19%	16%	23%
Surgery	14	7%	50%	23.5%	23.5%

\*Spoerel et al. (1976)

**Neurological outcome**

It must be remembered that even after severe disc herniation resulting in moderate weakness most symptoms resolve naturally in time, even if some mild residual deficit remains. Table 14 outlines the types of motor deficit that can be treated conservatively following nerve root compression from lumbar disc lesions. The patient must be accurately assessed according to recognised criteria to exclude other disorders in order to arrive at the diagnosis of a disc lesion (Cyriax 1982). In the case of complete palsy affecting one or more roots, no natural recovery would be expected.

It has now been discovered that in cases where sciatica resolves following epidural injections, follow-up CT scans generally show resolution of the disc protrusion a year later (Cowan et al. 1992). Disc herniations have been shown to undergo spontaneous recovery more readily (76%) than disc bulges (26%) following epidural injections (Bush et al. 1992). It is possible that acupuncture works best on the same category of patients that most readily undergo intervertebral disc resolution. According to Bush et al. (1992), who studied the natural history, such patients were younger, had shorter duration of

symptoms, and had posterolateral protrusions. Nuclear protrusions are those most likely to undergo resolution, whereas annular lesions are not subject to the same recovery process. This occurs when the nucleus comes into contact with the epidural space. The body perceives the nucleus as a foreign body, and repair processes, including auto-immune reactions, are stimulated. The resulting changes include neovascularisation and phagocytosis. Response to acupuncture should in the future be correlated with the type of disc protrusion.

It has been pointed out that for motor recovery to ensue from the nerve root itself would take well over a year at the standard rate of 1.5mm per day (Cyriax 1982). Motor power recovery following prolapsed lumbar intervertebral disc occurs at the motor-end plate via peripheral re-innervation (Yates 1964). This process takes 4-8 weeks. It is possible that, along with acupuncture's effects on reducing pain, inflammation and spasm in the low back, it may promote local re-innervation, perhaps via the release of growth factors which are known to be released following acupuncture. Furthermore, it remains to be seen whether the length of time the needles are retained influences this process. Chinese methods usually involve longer duration of needling (20-30 minutes) in cases of neurological involvement.

The mechanisms underlying acupuncture and epidural injections may well be different, as some patients respond well to one and not the other of these treatments. It is possible that the passage of time also influences this response. The CSAG report (1994) states that patients with nerve root problems should be "dealt with initially by the GP providing there is no major or progressive motor weakness".

Table 13

## REDUCTION IN MEDICATION FOR INTRACTABLE LUMBO-SACRAL PAIN FOLLOWING ACUPUNCTURE\*

	Aspirin		Analgesics		Narcotics		Tranquillisers	
	Before	After	Before	After	Before	After	Before	After
No operation	60%	10%	70%	10%	10%	0%	90%	10%
Laminectomy (1)	60%	15%	50%	15%	20%	5%	70%	15%
Laminectomy (2)	60%	25%	90%	25%	35%	15%	85%	35%
Laminectomy (3)	70%	30%	60%	40%	70%	30%	90%	30%

\* Kim and Yount (1974)

## Legend:

Laminectomy (1): One laminectomy

Laminectomy (2): Two or more laminectomies, with or without spinal fusion

Laminectomy (3): One or more laminectomies with one or more nerve pathways severed between peripheral origin and central termination, i.e. rhizotomy, cordotomy or stereotaxic brain surgery.

Table 14

**NEUROLOGICAL SIGNS AND SYMPTOMS IN LUMBAR DISC HERNIATION****Suitable for conservative management**

- i.* Moderate weakness of muscles unilaterally affected by 1 nerve root: generally recovers in 4-8 weeks but may take up to 7 months.
- ii.* Moderate weakness of muscles unilaterally affected by 2 nerve roots: muscles affected by the first root generally recover fully; in those supplied by the second some wasting may remain.

**Contraindications to conservative management**

- i.* Cauda equina signs and symptoms - urgent surgery needed.
- ii.* Rapidly deteriorating neurological signs.
- iii.* Signs or symptoms of possible serious spinal pathology, including underlying serious illness (CSAG 1994).
- iv.* Complete palsy of muscle(s).

*Early referral may be required for additional acute pain control. If it is not resolving satisfactorily after six weeks, the patient should then be referred urgently for appropriate specialist assessment and investigation".* Physiotherapy is recommended for nerve root problems.

The same categories of patient suitable for conservative management (Table 14) would be suitable for acupuncture. Improvements in sensation and motor power were frequently observed following acupuncture, often commencing from the very first treatment in acute, chronic and even post-surgical patients: extensive details were provided regarding effects on motor power and sensation by Longworth and McCarthy (1997). Many of the observations were anecdotal, but overall they involved large numbers of patients who showed improvement following acupuncture. Many authors, including Gunn *et al.* (1980) attributed the observed effects to acupuncture treatment and claimed the results were superior to the natural history.

One controlled study of neurological signs and symptoms reported that results following acupuncture were better than the natural history: Lobzin *et al.* (1992) studied 130 post-laminectomy patients and allocated them 2-3 days post-surgery into treatment by either *i.* acupuncture, *ii.* electroacupuncture, *iii.* physiotherapy treatment by sinusoidal modulated currents, or *iv.* a drug treated control group. Apart from superior pain relief being found in the electro-acupuncture and acupuncture groups, motor power recovery and sensory improvements were also noted. In drug treated controls only 10% of motor deficits improved over the course of the 12 day trial. In contrast, 5-10% of the motor deficits had returned to normal and a further 40-60% had improved in all three non-drug groups. The clinical improvements were objectively supported by EMG results. Sensory improvements were also found to be greater in the electroacupuncture and acupuncture groups compared with the drug treated patients.

The time taken for improvement in sensation and motor power to be established is significant. Where a patient responds to acupuncture, the response is normally rapid. Acupuncture responders continue to show significant changes in terms of pain relief within the first 5 days, often with loss of the majority of pain within 10 days. The authors have observed that progressive improvements in motor power and sensation are seen usually on a daily basis, commencing within the first couple of acupuncture sessions, and showing about 50% improvement within 10 days of daily treatment (with a 2 day break for the weekend after the first 4-5 treatments). Further motor power recovery is slower, often over 4-8 weeks. It is possible that acupuncture increases the proportion of patients who undergo the process of spontaneous recovery. In the opinion of the authors, patients with neurological signs and symptoms may not fare so well unless daily acupuncture treatment is given: at least 4 days treatment may be necessary before having a break from treatment. This may be problematic for patients commencing treatment just before a weekend.

Furthermore, the style of acupuncture may be important. Retaining the needles in place for 20-30 minutes may have a more powerful effect on reducing muscle spasm and treating motor or sensory changes than not retaining them. It is possible that superficial needling or shorter duration of needling does not produce beneficial changes in neurological signs and symptoms as effectively as traditional methods.

**Summary of influencing factors**

A number of factors have been found to influence the speed of response or the outcome of acupuncture treatment. These include the duration of the disorder, the age of the patient, the type of disorder (e.g. disc prolapse or OA), the type of treatment, and presence of neurological signs or symptoms, as well as general reactivity to acupuncture (Longworth and McCarthy 1997). Some cases of sciatica do not respond as quickly as others, and a minority fail to respond adequately to acupuncture treatment. It is thought that the following may influence outcome in such situations. The type of disc protrusion may be important as scans of patients proving to be refractory sometimes show centrolateral protrusions. It is possible these do not respond as well as those with posterolateral protrusions. Similarly, patients with more than one disc level affected are thought to account for some of the more difficult to treat. It would be expected that this type of patient would require more than the average number of treatments and some may be in that category who are unresponsive to treatment. Patients with certain types of lumbar deviation may also be difficult to treat. Straightforward fixation in flexion, where LBP is the presenting symptom, normally responds well to acupuncture treatment, but where sciatica is provoked by lumbar movement, slower progress may be expected.

Patients with lateral deviation whose lumbar movements reproduce sciatica are amongst the most difficult to treat by standard conservative treatments and may be in the category of patients who need laminectomy (Cyriax 1982). Similarly it has been noted that acupuncture treatment of this group of patients can show much slower progress than the average. Those with metabolic disturbances, such as diabetic or alcoholic patients, may also respond more poorly to acupuncture.

#### **Recommendations for future research**

The necessary trials require very large numbers of patients and would almost certainly need to be multicentred. There is no shortage of patients with LBP and sciatica; so the need is for resources and research application. Trials should be arranged as a joint venture with acupuncturists, rheumatologists and orthopaedic surgeons, so as to bring the diagnostic and treatment skills of each to bear on the task. To minimise the cost involved in repeating trials, the maximum amount of information must be extracted from each study. The type of detail that would be useful is shown in *Tables 15 and 16*. Although the detail may seem excessive, it should yield valuable information, and anyway most will have been collected in the history taking and diagnostic procedures. Thus in the future it may be possible to predict from a particular combination of symptoms if a patient is a good candidate for acupuncture treatment. A number of recommendations follow based on results obtained from our original review and clinical experience. Results will need to be analysed separately for those with LBP or sciatica, as the natural history of these conditions differs. Acute, chronic and post-surgery patients need to be studied separately because their responses to acupuncture are likely to be different.

#### **Acute back pain**

From the data available, it appears that the best results with acupuncture are from treatment that starts as soon as possible following the onset of symptoms, generally in primary care. Bearing in mind the high rate of spontaneous recovery, large patient numbers would be needed for statistical significance: even more so for simple LBP rather than sciatica, which may have a slower natural resolution. Patients should be randomly allocated to treatment by means of acupuncture or a suitable control.

Patients visiting their general practitioners do not usually have scans in the first instance, so this study would be of patients managed by primary care. *Table 16* shows some of the clinical information that could usefully be gleaned from the study.

The results could be compared with the outcome of manual therapies. A recent survey of private physiotherapists found that on average 3.5 sessions were necessary for acute LBP patients and 4.5 for chronic, where symptoms did not radiate below the

buttock (OCPPP 1997). However the CSAG report (1994) pointed out that sciatica is much slower in its response to treatment, but that no reliable figures are available. Nerve root symptoms are known to take up to 8 weeks to settle, even with successful standard conservative treatments. Trials should thus be designed that investigate the effects of:

- i. Manual acupuncture, electro-acupuncture, moxibustion, etc.,
- ii. Acupuncture in conjunction with other conservative treatments (TENS, manipulation, etc.),
- iii. Acupuncture compared with conservative regimes.

*Table 15*

#### **RECOMMENDATIONS FOR FUTURE RESEARCH INTO ACUPUNCTURE FOR LBP AND SCIATICA**

##### **Assessment**

- i. Use standard criteria for clinical assessment of LBP (Bush 1994; CSAG 1994; RCGP 1996).
- ii. Note presence or absence of neurological signs.
- iii. Grade weakness on Oxford scale and record area of paraesthesia.
- iv. Back up clinical diagnosis with scans: MRI is the scan of choice, otherwise radiculography or CT.
- v. Exclude serious pathology, cauda equina syndrome and rapidly deteriorating neurological signs.
- vi. Moderate neurological signs and symptoms can be included if unilaterally confined to 1 or 2 nerve roots of the lumbar spine.
- vii. EMG readings should be taken before treatment for those with neurological weakness.

##### **Trial design**

- i. The sample size must be large enough to give a statistically significant result.
- ii. Appropriate control groups must be used.
- iii. Patients must be randomly allocated between groups.
- iv. For in-patient trials, drug treated controls could be used, and for out-patient trials, waiting list controls could be added.
- v. Sham acupuncture may be a poor control for LBP, as the segmental areas influencing the low back extend over the low back, abdomen and legs; also distal acupoints on the arms and ear are commonly used for treating LBP, leaving very few parts of the body that would not be expected to influence the low back if needed. Sham acupuncture uses shallow needling over non-standard acupuncture points, but any needling may influence pain via diffuse noxious inhibitory control (DNIC) (Lewith and Machin 1983).
- vi. Cross-over trials may not be ethical for acute patients, as there will be a period of time during which the patient may not be treated.
- vii. Subjective and objective measurements should be recorded.

Table 16

**HISTORY, EXAMINATION AND INVESTIGATION OF LBP AND SCIATICA****Initial assessment**

Age and sex of patient  
 Type of employment  
 Family history of back problems  
 Past medical history  
 Smoking and alcohol  
 Time since onset  
 Type of onset: insidious or traumatic  
 Type of disorder:  
 disc, OA, post-surgical  
 First episode or recurrent  
 Differentiate between LBP and sciatica:  
 unilateral or bilateral  
 Previous treatment  
 Previous surgery:  
 type and number of operations  
 Medication type and amount taken  
 Previous acupuncture (and result)

Severity of pain (using VAS)  
 Area of pain (using body chart)  
 Quality of pain (using pain descriptors)  
 Any fixation in flexion  
 Any lateral deviation  
 Identify trigger points  
 Range of lumbar movements  
 Straight leg raising  
 Any neurological involvement  
 Femoral nerve test  
 EMG  
 MRI or CT scan  
 Treatment plan

**Evaluation on discharge**

Outcome related to age and sex  
 Return to work (type)

Cost of treatment and control groups  
 Duration of the disorder  
 Duration of the acute phase  
 Response related to type of disorder  
 Outcome related to diagnosis  
 Number of sessions needed  
 Improvement in LBP and sciatica

Additional treatments (e.g. manipulation)  
 Period of bed rest

Reduction in medication  
 Points used and method of treatment:  
 acupuncture, electro- (Hz), moxa  
 Degree of pain relief (using VAS)  
 Area of pain relief (using body chart)  
 Quality of pain relief (using pain descriptors)  
 Remaining fixation in flexion  
 Remaining lateral deviation  
 Relief of muscle spasm  
 Improvement in lumbar movements  
 Straight leg raising improvement  
 Neurological outcome  
 Change in Femoral nerve test  
 Repeat EMG  
 Repeat scans to see any resolution  
 Follow-up

As 44% of the total NHS budget for LBP disorders is spent on hospital in-patients, this is an important group to study. Patients needing urgent surgery for cauda equina syndrome, or those with rapidly deteriorating neurological signs or serious illness should be excluded; however, many patients are admitted to hospital for bedrest with medication. Some would have previously had investigations, including scans and EMG, whilst others would be assessed in hospital. For this group of patients with suspected musculo-skeletal back disorders, with or without sciatica, acupuncture would be appropriate. In China, large numbers of in-patients are treated successfully with acupuncture.

The severity of the pain is not in any way a contraindication to treatment. However treatment regimes may need to be modified. Patients unable to turn in bed may, for instance, need distal acupuncture points for the first treatments until able to do so, and those patients uncomfortable in the prone position can be treated lying on their side.

In-patients may be on quite a cocktail of drugs including opiate and non-opiate analgesics, anti-inflammatories and tranquillisers; so vaso-vagal reactions may be expected somewhat more

frequently than normal. The patient will be lying down in any case and the needles can merely be removed at the first sign of feeling faint. For this reason it is particularly important that in-patients are not left unsupervised when under acupuncture treatment. In China such reactions are considered favourable, and even if it has only been possible to leave the needles in situ for a few minutes, good improvement would be expected at the next session.

Acute hospital in-patients with lumbar disc lesions who were more active were also more liable to relapse and require more treatments than those who remained on bedrest (Wang and Wang 1986). Therefore it might not be helpful to shorten the period of bedrest for acute in-patients. The greatest benefit may be seen from using acupuncture in combination with high frequency TENS for the hyperacute patient. Rarely patients may feel faint with the use of TENS alone, normally at the first treatment, so a cautious approach should be adopted when using the combination. TENS can be demonstrated on the patient for a few minutes during the first session, followed by acupuncture. The patient may then be instructed to wait a couple of hours before reapplying the TENS, this time for a

longer period of between 20 and 60 minutes as required.

Attaining needling sensation appears to be associated with a good reaction to acupuncture, particularly for nerve root pain. The authors recommend leaving needles in situ for 20-30 minutes for acute patients unless faintness intervenes. Use one or one and a half inch acupuncture needles for the lumbar spine in accordance with standard point location. Treat daily for up to 10 sessions followed by a break from treatment of 2 weeks. During the 10 sessions, a break of 1-2 days may be taken over a weekend. Patients who have improved but are not pain free may then undertake a further course of up to 10 treatments. Continue to treat until the best results are seen. It is possible that using too few needles or too few treatments will fail to achieve the full effect of acupuncture.

After the first treatment most patients report a tiny improvement in terms of pain relief. However, they commonly sleep well after treatment, which is taken as a good response. Those using TENS concurrently with the acupuncture generally experience faster initial pain relief. After a second treatment most patients report more pain relief and can move better within the bed. It may be expected that 5-10 sessions will be needed to radically reduce the pain. A smaller number of patients take 15 or even 20 sessions to effect maximum pain relief. Sometimes as nerve root symptoms are reducing, the patient experiences a temporary increase in backache, though this is not severe.

#### *Chronic back pain*

Chronic back pain or acute on chronic flare-up of pain may respond in a different way to acupuncture than acute pain. Alternative protocols may therefore need to be used. Once again, drug treated or waiting list controls might be suitable, perhaps with a mock TENS group for reproducing the *attention* aspect (placebo response). It would be useful to evaluate different treatment parameters:

- i. Investigate the suggestion that low frequency electroacupuncture works best for chronic, nociceptive LBP.
  - ii. Evaluate the benefit of giving both high and low frequency electrical stimulation together in one session. This could be done in different ways: locally applied TENS at high frequency and low intensity could be given to achieve a segmental response, whilst low frequency electroacupuncture could be used on more distal points for a generalised analgesic (DNIC) effect.
  - iii. Compare the effects of acupuncture, low frequency electroacupuncture and high frequency TENS.
  - iv. Compare the results of acupuncture with those of manual therapy.
  - v. Evaluate the results of acupuncture combined with manual therapy.
- Trials of post-surgical acupuncture would be

similar in design to those featuring the acute or chronic patient. Further investigation as to the type of operation and how this affects response would be useful. It might be expected that results would be best in those treated soon after the onset of symptoms.

#### **Conclusions**

The design of research studies into acute sciatic syndromes has been poor on the whole, and does not allow for conclusions to be drawn. The lack of independent assessment and the small numbers of patients involved in some studies are valid criticisms. However, the overall trends indicate that acupuncture may be of use in the rehabilitation of chronic pain patients. Furthermore, the potential cost savings should be explored. In any such assessment, it should be remembered that the cost of LBP to industry has risen to £5 billion per year in time off work alone; this is a result of 150 million working days per year being lost (CSAG 1994).

In any trial, the amount of information presented is a crucial factor in the compilation and comparison of data. It is this which will allow future clinicians to derive the benefit from present studies and allow patient and society to benefit by reducing the burden of low back pain on both.

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**Wendy Longworth** MCSP SRP LicAc  
East Finchley Clinic, London

**Peter W McCarthy** PhD  
Department of Applied Science  
University of Glamorgan

**Address for correspondence**  
Wendy Longworth  
East Finchley Clinic, Cory Pharmacy  
166-168 High Road, London N2 9AS (UK)

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