CONSERVATIVE MANAGEMENT OF LOW BACK PAIN

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Tables

INTRODUCTION

Back pain is a world-wide experience. Disabling back pain appears to be a problem for western and industrialised societies, possibly related to the development of "welfare" states. Disabling back pain is a major problem in the United Kingdom (UK) - see Fig. 1
[1], the United States of America (USA) [2] and elsewhere [3]. In this review the term "low back pain" will imply the symptom complex where pain is localised to the lumbar spine or refers into the leg or foot and where other specific conditions causing such pain have been excluded. Other clinically important patterns of referred pain are given in Table 1.

Explanations for back pain may be found in factors shown in Table 2. Whilst chronic pain may stem from disc, facet joints and the supporting soft tissues (particularly the ligaments), psychosocial factors are important. Indeed the concept of pain includes both sensory and emotional components - see Glossary.

Medical training probably inhibits a satisfactory approach by doctors by concentrating on the exclusion of pathology, when patients need understanding of their problems [4], alleviation of their symptoms and encouragement that activity is not harmful, but therapeutic [5].

The individual's strengths and weaknesses are important e.g. in their positive or negative responses, reactions of family and colleagues, ability to "fight" to prevent recurrences etc. Thus a positive attitude is required from "professional advisors" from the initial acute attack onwards. "Person management" is a prerequisite to back pain management.

The spine is the most complex part of the skeleton, constituting 139 joints, 24 discs, numerous bursae, ligaments and muscles comprising support structures. It is designed to take the weight of the upper part of the body, to allow movement and to protect the spinal cord - and thus it goes wrong more often than any other part of the musculoskeletal system. Patients need to understand this. Pain may arise from any spinal structure except bone, as they all contain nerve endings which could contain pain receptors [6].

The difficulties of assessing studies on therapy in low back pain have been extensively reviewed elsewhere [7-9], but benefit has been shown for increasing numbers of patients through randomised controlled trials. The Cochrane Library has been used to assist evaluation of such studies in this review.

EPIDEMIOLOGY

The "back pain epidemic" [10] is of enormous economic proportions (Table 3), costing the National Health Service (NHS) £481-1061 million with indirect costs possibly exceeding £5-10 billion [1,11,12]. Back pain is one of the commonest causes of inability to work through illness in the UK and makes enormous demands on the NHS and the private sector - see Fig. 2.

In the USA medical costs exceed $24 billion [13] and indirect costs may exceed $30 billion [14]. Approximately 200,000 surgical procedures are performed annually. As many as 30,000 operations may be unsuccessful, joining the "high-cost, high-demand and highly emotional subset of the low back disabled" [15]. The chances of any individual coming to back surgery are 6 times greater in North America than in Europe.

The point prevalence of back pain is 7-14%, [16,17], one year prevalence is 36-37% and life time prevalence is 58% [18]. Back pain frequently recurs [19-26]. It is equally prevalent in both sexes [27], although its clinical course may be different; disc disease being more prevalent in men [28] who have more surgery [29] whilst in women it may be more likely to linger into chronicity [30]. Pregnancy, abortions and parity are associated [31]. A causal relationship with epidural analgesia seems unlikely.

Jobs requiring physically heavy work, static work postures, frequent bending and twisting, lifting & forceful movements and repetitive work and vibration [32-35], which includes that from driving vehicles [28,36,37], predispose to low back pain [38]. Nurses doing the most physical work have a greater incidence than construction workers, garbage collectors and truck drivers [39]. Psychological factors are implicated e.g. monotony and work dissatisfaction [34,38,40,41]. Other risk factors include smoking [20,28,36,42,43] (which may be linked with atherosclerosis of the abdominal aorta [44]), road traffic accidents and falls [45].

Related social factors include a poorer economic situation; drug and alcohol abuse; divorces and family problems; self-reported sexual and physical abuse [46] and a lower level of education [38,47]. Health associations include previous hospital admissions/operations [20] and a propensity to use health services; cardiovascular and gastrointestinal symptoms [48].

THE NATURE OF BACK PAIN

Low back pain is classified into that caused by mechanical back pain (that arising from the lumbar segment without direct nerve root involvement); direct nerve root (or rarely the corda equina) involvement from structures within the lumbar segment; and spinal pathology.

Many treatments for low back pain are based on the assumption that pain relates either to excessive mechanical stresses (at work or leisure) on normal structures, normal stresses on degenerate structures or the poorly resolved aftermath of an acute episode [49]. Psychological management for both acute [30] and chronic back pain [1,50] is important. In 1959 it was noted that 'the patient's ability to "live with his back" seems to be more important than the form of treatment' [51].

Patients should be treated optimistically avoiding bed rest and hospitalisation if possible [52]. Waddell views the "back pain epidemic" as partly being contributed to by doctors prescribing rest and partly to social concepts of disability and contrasts the traditional medical model of illness with a biopsychosocial model [1,50].

Many episodes of pain do not resolve 53,54. Croft has shown that patients with back pain may have persisting symptoms even though they may not return to the general practitioner (GP). The risk of an exacerbation or a recurrent attack is always present. Management must emphasise the importance for patients of adopting strategies that minimise the risks of recurrences.

Chronic pain is multifactorial with obstruction of the epidural veins and fibrosis around the nerve roots giving rise to perineural atrophy [55]. The dorsal horn may be involved accounting for hyperpathia and allodynia, explaining widespread sensitivity of the back and lower limbs to pressure. Sympathetically maintained pain may arise from altered central neuro-modulation within the spinal cord giving rise to syndromes similar to regional pain syndromes [56].

DIFFERENTIAL DIAGNOSIS

There is a delicate balance between not missing treatable pathology, and avoiding unnecessary investigation which may increase patient's fears about their condition [57]. It is achieved by pattern recognition of common presentations of low back pain (Table 4). Non-specific low back and/or leg pain (NSLBP) should be diagnosed on positive grounds (Table 4). There are 3 important patient groups to consider - those with NSLBP; compression of the nerve root or cauda equina; and back pain caused by other conditions [1,58]. A marked relationship to body posture is common, often aggravated by sitting or standing and eased by walking. Pain aggravated by walking raises the possibility of vascular claudication, spinal or lateral canal stenosis.

Spinal stenosis is a symptom complex of root pain and sensory or motor symptoms noted when walking and fading after a few minutes sitting or flexing the spine [59] . More complex algorithms can be consulted [59,60] and fuller reviews of the differential diagnosis are available [57,61,62] (Table 5).

Thoracic pain is less common than lumbar or cervical pain and requires investigation [1]. Vertebral collapse may be due to osteoporosis but myeloma or secondary malignancy need to be excluded. Loss of height is almost universal with age and usually reflects loss of disc height. Most kyphotic spines reflect degenerative processes.

Serious causes of back pain are present only in a small minority of patients referred to hospital and are suspected from "red flags" [1] (Table 6). Some vascular and neurological disorders, osteoarthritis and osteoporosis may not have these stigmata!

Pelvic pathology is hard to exclude on history as many women notice their pain to be worse in the last few days of their menstrual cycle, easing off early in their period. This may also be noted in women with other pains or headaches. Where there is doubt, abdominal and pelvic examinations are required.

Having excluded sinister diseases, exclusion of root or cord compression may require imaging. A scheme for radiological investigation is given in Table 7. Discussion with a musculoskeletal radiologist is invaluable.

PREVENTION

Back pain and subsequent disability (including work loss) can be prevented (Table 8).

Primary prevention eliminates/minimises the risks to health or well being [63]. Corporate stress management programmes at three high risk work sites have reduced the number of accidents and related costs [64]. Low back injuries are the commonest and most costly injuries in terms of compensation and productivity in the US railroad industry and are correctable (Table 9). Low back injuries and lost work days fell to zero and absenteeism fell from 4-1% [65]. Introducing a back injury prevention programme in California showed a net benefit to be $161,108 with a return on investment of 179 percent [66].

A large study showed no reduction in among postal workers who had been instructed in back pain prevention [67]. Teaching and social support may not alter behaviour [68] but in a work environment may be more effective [69].

Secondary prevention is the alleviation of symptoms, minimising residual disability and factors that may cause a recurrence [63].

This topic is addressed in the sections on back schools and intensive rehabilitation. It is the combination of intensive physical training, behavioural principles and attention to the working environment that is effective. Back schools may be more effective in the work environment [64].

Tertiary prevention implies the rehabilitation of those with disabilities to optimal function and modification of the workplace to accommodate residual disability [63].

Studies reporting follow-up data of 6 months duration may be considered preventive[64]. Cognitive behavioural therapy is effective for many patients [70] and rehabilitative approaches are discussed below.

Back education from specially trained physiotherapists during pregnancy reduced the amount of back pain during pregnancy, sick leave during pregnancy and postpartum back pain [71].

ACUTE LOW BACK PAIN

Correct management of acute back pain in primary care is crucial to the prevention of long-term back pain and disability [1]. Consequently, guidelines for the initial management have been issued by many bodies [1,2,72-75]. All concentrate on the critical initial triage of patients into three groups - those with non-specific low back pain (table 4), those with nerve root compression or those with other diseases presenting as low back pain (Tables 5,6). They use “red flags” (Table 6) to alert clinicians to serious pathology [1,73].

Advice on the history, examination and key management is given in Table 10. Provision of literature prevents unnecessary treatment including surgery [76]; lessons harmful beliefs, and reduces disability [77]. The patient must be taken seriously [78]. In the absence of root signs or suggestions of other pathology, advice that activity is helpful, clicks are not harmful and that pain does not signify serious illness are all important.

Without neurological involvement, bed rest beyond 2 days is counterproductive [1,75,79]. Analgesia assists this policy, as will the reassurance given by the physical assessment performed by the GP. Bed rest is usually best in the position of maximum comfort [57,80,81]. Provision of a corset, assessment of furniture heights to assist transfers, domiciliary physiotherapy and a commode by the bed may all assist mobilisation.

Drugs

Medication is important (Table 11) as severe pain inhibits compliance and a speedy return to work. It minimises unnecessary rest to control pain which enhances the ability to regain normal activities quickly. A non-steroidal anti-inflammatory drug (NSAID) is often helpful [8], particularly to obtain sufficient duration of analgesia for a good sleep [82]. The risks of short courses may be no more than the risks of prescribing stronger opiate derivatives. Care must be taken in smokers, those with a history of dyspepsia or elderly people. Inability to control pain at home without using strong opiates is an indication for admission to hospital in my practice. Further information is available in standard reviews/texts [2,57,83-86].

Physical management

Considerable evidence supports the role of physical therapy in acute/subacute back pain. Increased compliance with better results from physiotherapy can be obtained by simultaneous use of complementary literature and by planned review of patients after treatment [87]. Physical therapy [88]; chiropractic [89,90]; probably osteopathic manipulation [91]; manipulation by physical therapists [9,58,92-95] psychological management (with more supervision and planned withdrawal of treatment (behavioural group)); McKenzie techniques of passive extension and postural correction [21,23]; graded activity programmes with a behavioural therapy approach [96] and "behavioural support" in a “sports injury” approach [97,98] can reduce pain and disability and in some cases work

absence, compensation and disability award costs. Corsets should be reserved for those with failed manual therapy [49,99].

As cervical symptoms often co-exist with low back symptoms (Frank et al - unpublished data), advice about physical and ergonomic measures must be appropriate for all parts of the spine. Thus lying prone may help some with low back pain, but aggravate mild or asymptomatic neck problems.

An international group has now produced a series of psychological risk factors for chronicity (Table 12). These “yellow flags” may prevent development of excess pain behaviour / sick role, recurrence/re-injury and the long-term complications of disability - loss of function, independence and work [63].

Back pain in elderly people is an important topic which has been reviewed elsewhere [81].

Chronic low back pain

Exercise regimes aim to increase range of movement, strengthen muscles, stretch tightened structures or toughen up physically and mentally [49,57,100]. Evidence supports the following exercise regimes:- back extension [87,101-105]; calisthenics [105]; mixed exercise regimes [106]; isometric flexion exercises [107,108]; mobilising exercises [108]; and McKenzie [23,109].

Exercises combined with behavioural methods are more effective [110], reduce sickness behaviour [111] and get people back to work quicker [96]. Increasing the range of spinal movement does not necessarily reduce pain or disability [112]. Aerobic exercise is beneficial [113,114] and may improve job satisfaction [39].

Intensive outpatient physical retraining consisting of pain relief & mobilization, increasing movement & muscle strengthening and work conditioning reduces work absence. Health care costs were offset by savings in "wages loss cost" [97,98].

Many studies [89,90,92,93] and reviews [94,115] support the view that manual therapy including manipulation is effective in reducing chronic pain although this view is not universally accepted [116]. Studies comparing manipulation with exercise (or manipulation + exercise) are currently taking place.

Corsets for unselected patients are less effective than active therapy [117]. Patients with failed manual therapy, pain on physical activities (particularly if it facilitates remaining at work) and those with scoliosis or unstable spondylolisthesis may benefit.
Traction helps a few patients though demonstration of its benefits in controlled studies is lacking [118]. Bed rest in traction is not recommended [1].

The background of chiropractic and osteopathy has been reviewed [119]. Chiropractic has been studied [89,90,120] and appears effective. The public need to be safeguarded against those using unproved techniques which may be harmful [121,122]. Doctors are advised not to recommend heterodox treatment unless the practitioner is a member of a recognised professional association [123].

Medication

Many people strive to avoid medication “on principle”. Whilst understandable, this can be counter-productive and patients must be aware of the side-effects of not taking drugs e.g. constant pain, loss of sleep, irritability and its effects on family life, loss of function at home and work.

Initially, regular analgesia is advised using the simplest effective medication (Table 11). Long-acting preparations may be available. NSAIDs may be useful but long-term they are best avoided in view of their side-effects [124].

Stronger preparations e.g. Tramadol have been found particularly useful recently [124] but longer term analgesia encourages sedation, nausea and constipation etc and many patients rightly discontinue their use. Having effective tablets "on hand" is prudent

and helps counter the fear of aggravation with activity and may inhibit the risks of depression [49], in addition to giving the patient some control of their pain.

Opiate use is controversial [84,125]. In my opinion, if patients are deemed to need opiates, they should be assessed (probably as an inpatient) to exclude treatable causes of pain, sort out psychosocial issues, treat depression if present and to commence aggressive rehabilitation.

A major advance in chronic pain management is the use of tricyclic antidepressant compounds (TCA) [84,124,126-128] for pain modulation. They appear more effective in the presence of root compression. Benefits are shown for those with or without depression and for those with a physical basis for their pain. The sedative side effects are helpful in those having disturbed sleep and they may facilitate relaxation. Appropriate warnings about sedation and a dry mouth must be given. Patients will need reassurance that TCAs are not addictive or being prescribed for psychiatric purposes. Amitriptyline, Dothiepin (Dosulepin) and Lofepramine have all been used. The role of serotonin antagonists in chronic pain has only recently been investigated. It is likely that they have no role in chronic pain, only in the treatment of the depression that it engenders[129].

INTRACTABLE LOW BACK PAIN

A few patients have persisting disabling pain despite the above management. Investigations, often including magnetic resonance imaging (MRI) have excluded systemic illness or demonstrated that the pathology is degenerative and not operable. The term "intractable" pain differentiates failed conservative management from previously untreated chronic pain, or "chronic pain syndrome", when changes in behaviour are apparent [58]. Up to 10% of these patients may have an underlying medical problem [130].

At this stage both physical and psychological factors are likely to be significant [49,131], either predominating. Although they are described separately for clarity, both aspects must progress simultaneously.

Physical management

Clues that physical aspects are important lie in the pattern of pain which is often episodic and related to movement or posture (Table 13). Sleep patterns are important. After checking bedding [49,57], it must be established whether sleep loss is due to insomnia, pain or depression. Unvarying pain suggests that depression may be present. If pain disturbs sleep long-acting NSAIDs or analgesics are needed. If the pain is post-traumatic, flashbacks and nightmares need to be excluded [132,133].

There is limited evidence to support transcutaneous electrical nerve stimulation (TENS) [134] or acupuncture, although opinions vary [135,136]. Serious adverse events have been reported following acupuncture, but seldom from orthodox medical practice [137].

Initially analgesics and / or NSAIDs are used separately or in combination to facilitate control of pain and the commencement of physical therapy (Table 11). If unsuccessful, tricyclic compounds may be added to the regime. Ultimately the objective is to wean of all regular analgesics and NSAIDs, using tricyclic compounds to facilitate this if needed. TCAs can be sometimes withdrawn over time. Patients with clinical depression and who do not tolerate TCAs will need SSRIs.

Injections may be given into the epidural space, facet joints, discs or the soft tissues. There is little evidence to support their use [138]. They do not appear to get patients back to work [139]. A recent study of sclerosants was unhelpful [140]. Injections may establish the source of pain [141] with psychological benefits and if transitory pain relief is achieved, intensive therapy may be effective.

Psychosocial management

A significant group of patients present with constant unchanging pain. Many suffer from the "pain or illness behaviour syndrome" [50,142], sometimes considered as "learned helplessness" [143]. The effect on the spouse or "significant other" needs evaluation [143] particularly if over-protection or excessive sympathy has encouraged the adoption of a "sick/patient role". Patients may have problems consequent to loss of earnings or changing marital/sexual relationships [49,57]. Often unrealistic fears exist - that long-standing pain must be caused by horrific disorders e.g. cancer or multiple

sclerosis [57]; of long-term disability [144] or that activity will aggravate the pain [145]. A disproportionate number appear to have post-traumatic pain. Issues relating to compensation, post-traumatic stress disorder and post-traumatic weight gain are discussed elsewhere [132,133] and are often associated with depression.

Examination may reveal a non-anatomical pattern of pain [146] and is often accompanied by exaggerated gestures, particularly during the straight leg raise test [147]. These patients used to be considered malingers, or to exhibit “functional overlay”. It is now recognised that this pattern of behaviour reflects “distress” - an unconscious desire on the part of the patient to show the doctor just how much they hurt -often believing that their suffering has been trivialised by doctors and others [148].

Cognitive behavioural therapy (CBT) is the cornerstone of psychological pain management and is effective in chronic pain patients (about half suffering from back pain) [70]. Groups help in boosting confidence through sharing experiences. Self-help may be facilitated by appropriate literature e.g. "Living with your pain" [149]. Sometimes specialist counselling is needed.

Patients attitudes and beliefs about back pain, behaviours, compensation and emotional issues can all be noted early during the subacute period [63]. Many of the psychological factors which may inhibit resolution of symptoms (Table 14) are amenable to psychological or psychiatric intervention.

Usually both physical and behavioural approaches are combined simultaneously [30,96,110]. Pre-existing psychopathology is frequent in those requiring intensive rehabilitation [150] and does not militate against a successful outcome [151].

"Back Schools" may mean any programme with an educational content varying from one outpatient session to an inpatient programme [21,152-155]. A recent review [156] suggests they are effective, particularly in occupational settings.

Intensive rehabilitation programmes involve multi-professional physical, psycho-social, educational and vocational components which include learning to function in spite of pain, CBT, and developing physical tolerance in both fitness [113] and vocational areas - e.g. the Helsinki [155,157,158], Texas [159] and Turku [111] programmes. Such programmes embrace the concepts of back school education, work hardening [159], sports injury approach [97,98] and functional restoration [160-162]. Results may be better if the programme is inpatient [155]. The key features of facilitating a return to work are given in Table 15.

Advice on self care, living and coping with low back pain is explored elsewhere [57].

SERVICE IMPLICATIONS

Back pain and disability can be ameliorated and further episodes minimised by professional intervention at the initiation of the first episode through manipulation, physical training, a variety of exercise programmes and multi-professional rehabilitation. Minimal rest and a planned withdrawal of support are important developments with demonstrable benefit.

Delays in obtaining specialist advice contribute to non-resolution of acute/subacute back pain, increasing the pool of chronic pain patients and the risk of pain becoming intractable. These people may progress to pain behaviour, becoming more costly for employers and the state. Multi-professional integrated programs within 3 months can abort this process [96].

Diagnostic and treatment protocols can decrease accidents and lost work days and be cost effective [60] if costs to all sections of national life (state and industry) are considered. Good protocols exist for managing acute back pain but investment is needed to establish cost-effective intensive rehabilitation programmes in many countries.

11 SUMMARY

Although back pain appears prevalent throughout the world, back pain disability has now reached epidemic proportions in western (and probably most industrialised) societies. Few patients with back pain have serious medical pathology or direct involvement of nerve roots requiring surgery. Although the causes of back pain remain unclear, physical stress and its consequences on discs, facet joints and supporting soft tissues at work or leisure are thought to be mostly implicated.

Modern management emphasises the role of self-care which should begin in general practice at presentation of the first episode and be reinforced by all health professionals. Use of guidelines for the management of acute low back pain should greatly improve management of the acute episode. In the absence of root compression, bed rest should not exceed 48 hours. A positive approach is encouraged, acknowledging that returning to a normal life may require working through pain. Emphasis is on encouraging a rapid return to physical fitness and other activities, including employment. Medication facilitates this.

Studies demonstrate the ability to lessen the duration and severity of individual episodes of back pain and reduce recurrences and their cost in terms of suffering and lost work. No one should remain in pain longer than 6 weeks without being referred to a specialist service. This should include provision of information, access to manual therapists with postgraduate training, education on back strain prevention and physical fitness; clinical psychology pain services and consultant support. Comprehensive (and inpatient) pain and rehabilitation services should be available.

Future challenges lie in detecting those who are unlikely to respond to physical measures and back education so that developing coping strategies, reducing the inhibitory effects of fear and managing social issues may reduce those who require costly, intensive and probably inpatient rehabilitation.

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Table 1

Common patterns of referral for spinal pain

Occiput to bifrontal areas (common cause of headaches)

Arms

Chest wall - common cause of non-cardiac chest pain

Loins - often mistaken for kidney pain

Groins

Femoral distribution

Sciatic distribution

TABLE 2

POTENTIAL FACTORS PREDISPOSING TO SPINAL PAIN

CONGENITAL

Shape and size of spinal canal

Predisposition to disc degeneration

Hypermobility

Abnormal boney segments:

- reduction in vertebrae
- fusion of all or part of segment
- abnormal segment eg spondylolysis
- pseudojoints

ACQUIRED

Excessive mechanical stress on normal structures

Normal stresses on weak / degenerate structures:

- soft tissues
- discs
- facet joints

Other spinal pathology

Modified from the Oxford Textbook of Rheumatology, Second Edition, 1998 [80]

Table 3

ESTIMATED CONSEQUENCES OF THE BACK PAIN EPIDEMIC IN THE UK

Estimated total work incapacity (1997/8): 90 million working days (DHSS figures)

Lost output: Estimated loss (1997/8) £9,090 million [12]

General practitioner consultations: estimated 8.2-12 million annually [12,18]

Hospital outpatient consultations: estimated 1.7-2.4 million annually [12,18]

Hospital inpatient episodes (1994/5): estimated 70,000 [12]

TABLE 5

SOME CAUSES OF LOW BACK PAIN

Mechanical/ Degenerative	Muscles and ligaments (eg hypermobility)
	Joints
	Discs
	Nerve compression - root or cauda equina (spinal stenosis)
Inflammatory	Ankylosing Spondylitis
	Rheumatoid Arthritis (rare)
Infections	Bacterial osteomyelitis
	Tuberculous osteomyelitis
	Epidural abscess
	Brucellosis
Neoplasms	Multiple myeloma
	Lymphoma
	Secondary cancer
	Primary cancer (rare)
Bone disease	Osteoporosis
	Osteomalacia
	Paget's disease
Other	Gynaecological
	Neurological
	Renal
	Sickle cell disease
	Vascular "claudication"

TABLE 4

FEATURES OF NON-SPECIFIC "MECHANICAL" LOW BACK PAIN

Site (1 or more of the following)

Discomfort across lower back

Central pain, usually over L5

Leg pain and / or paraesthesiae within "sciatic" distribution

Unilateral or bilateral buttock or lateral back pain

Character

Episodic or cyclical pain in the middle years of life

Arises from L3-S1

Early morning stiffness/pain eases when up and about

Relationship to posture (often aggravated by sitting or standing still and eased by walking normally)

NB Pain markedly aggravated by walking raises possibility of vascular claudication, spinal or lateral canal stenosis.

Modified from the Oxford Textbook of Rheumatology, First Edition, 1993 [163]

TABLE 6

FEATURES SUGGESTIVE OF UNDERLYING ILLNESS

1. Absence of typical features - Table 4

2. Red flags [1]

Constant unremitting pain in atypical or multiple sites

Pain unrelated to movement / posture
(non-mechanical pain)

Systemic / constitutional symptoms

Age less than 20 or over 55 with no previous similar episodes of pain

Widespread neurology

Structural deformity

Modified from the Oxford Textbook of Rheumatology, First Edition, 1993 [163]

TABLE 7

GUIDELINES FOR RADIOLOGICAL INVESTIGATION

First attack of pain

Age 25-55 pain resolving within 6 weeks - no X-Ray needed
static after 1 month - long lateral *

Age 0-25 pain resolving within 6 weeks - no X-Ray needed
static after 3 weeks - AP and lateral *

Age over 55 pain resolving within 3 weeks - no X-Ray needed
unresolved within 3 weeks - AP and lateral

Atypical back pain - well localised (1 or 2 adjacent levels)
CT scan or MRI if available

Atypical back pain - not well localised - Bone scan.
If positive, CT +/- biopsy under imaging control (or open).

Discogenic disease - well localised (1 or 2 adjacent levels) **
Surgery being considered/nerve compression CT scan or MRI **

Intractable mechanical low back pain - local anaesthetic +/- steroid
into one or more facet joints to localise source of pain ***

Second attack of pain

If similar to previous episode - no X-Rays needed

If different in character or level, as above

Indications for radiology for psycho-social management +

Plain films - for visual display of structural normality or abnormality
when explaining the mechanical nature of back pain

CT or MRI to define presence or absence of discogenic disease for prognostic reasons
e.g. timing return to work, to improve motivation to persist/embark on painful therapy

***** If sacroiliitis suspected, dedicated views of sacroiliac joints (SIJ),
or CT scan may confirm if SIJ normal on AP film

****** Rarely surgeons will require radiculography preoperatively particularly if non-invasive investigations have suggested multi-level disease and MRI not available.

******* Discography seldom used now for such purposes

\+ Not all radiologists understand the role of X-Rays in overcoming patient's fears

Modified from the Oxford Textbook of Rheumatology, First Edition, 1993 [163]

TABLE 8

Strategies for preventing back pain

Primary prevention

Elimination or minimisation of risks to health or well-being

Modify risk factors
- smoking
- obesity
- psychological profile
- level of physical fitness

Education - ergonomics in the work place
posture
stress management
lifting strategies
driving certain types of vehicles

Exercise - cardiovascular fitness (for example, aerobics)
spinal mobility / flexibility
muscle strength

Industrial back injury prevention programs

Secondary prevention

Preventing the acute attack from becoming chronic

- Use of treatment algorhythms - rapid access to skilled advice
- Reorganisation of claims procedures
- Behavioural modification in back schools and intensive rehabilitation

Tertiary prevention

Rehabilitation - restoring to optimum function and accommodating residual disabilities
CBT and relaxation
Multi-disciplinary pain management programs (probably)
Behavioural modification in back schools and intensive rehabilitation

Table 9

Ergonomic approaches to minimising back injuries in the Railroad Industry [65]

Storing tools and materials off the ground - between knee and shoulder height

Heaviest items stored at knuckle height

Devising winches to lift and handle heavy equipment

Worktables, dollies and carts to handle heavy car parts and tools

NB Management took a participatory approach and encouraged workers to configure their own tools and material handling devices

Table 12

"Yellow flags" for risk of chronicity in unresolved low back pain

Presence of a belief that back pain is harmful or potentially severely disabling

Fear-avoidance behaviour (avoiding a movement or activity due to misplaced anticipation of pain) and reduced activity levels

Tendency to low mood and withdrawal from social interaction

An expectation that passive treatments rather than active participation will help

Suggested questions (phrased in treatment providers own words)

Have you had time off work in the past for low back pain?

What do you understand is the cause of your back pain?

How is your employer responding to your back pain? Your co-workers? your family?

What are you doing to cope with back pain?

Do you think you will return to work? when?

From Kendall NAS et al [63]

Table 10

The initial consultation for acute back pain

History

Listen to site and character of the pain - see Tables 5-6

Examination

Ask patient to show you the site - the characteristic hand movements
- particularly helpful if there are language barriers

Check for obvious spinal deformity, spasm or gross loss of movement

Check straight leg raise (SLR), reflexes and sensation if leg pain symptoms present

Management

Explanation and information - e.g The Back Book [164]

Minimise rest and encourage resumption of normal activity - including work - patient must take **active** part in recovery

Advise regular and not "as needed" analgesia - may enable activities to be maintained

Examine the reasons for the patient's specific fears - reassure if appropriate:-

Serious illness very unlikely

X-Rays and blood tests unlikely to be needed

Most severe back pain improves within days or a few weeks; milder symptoms may persist a few months

Recurrences are common

Offer early review if the pain is uncontrolled.

NB Ensure the patient feels comfortable with your actions and plan.

Table 11

Oral medication used in back pain

Standard analgesics Paracetamol, dextropropoxyphene, codeine & dihydrocodeine
or in compound preparation formulation
(coproxamol - paracetamol and dextropropoxyphene)
(cocodamol - paracetamol and codeine)
(codydramol - paracetamol and dihydrocodeine)
long-acting compound preparations
e.g. Ibuprofen and codeine

Non-steroidal anti-inflammatory drugs (NSAIDs)

Mostly Cyclo-oxygenase 1 (COX-1) inhibition

Proprionic acid derivatives - e.g. Ibuprofen, Naproxen

Others e.g. Soluble aspirin, Diclofenac

Some COX-2 inhibition

Nabumetone, Lodeine, Meloxicam

COX 2 inhibitors - Rofecoxib

Strong analgesics

Moderately potent:- Meptazinol, Nefopam, Pentazocine, Pethidine

Potent:- Buprenorphine, Tramadol

Very potent:- Diamorphine or Morphine
(? not appropriate for use in primary care)

Other Muscle relaxants or mild tranquillisers
e.g Diazepam for 5-7 days (acute back pain only)
Tricyclic antidepressant compounds (chronic pain only)

TABLE 13

PHYSICAL BARRIERS TO SUCCESSFUL OUTCOME

Repetitive poor posture at work / housework

leisure / or inappropriate activities

Repetitive lifting , particularly if involving twisting

Inappropriate bed or mattress

Sleeping in an inappropriate position

Getting in / out of bed incorrectly

Inappropriate exercise regime

Sitting > 1/2 hour (particularly when driving)

Recurrent bending (eg when brushing teeth)
(particularly if twisting)

Stopping exercise regime when "better"

Defaulting medication or corset

Lack of physical fitness

TABLE 14

PSYCHOLOGICAL BARRIERS TO SUCCESSFUL OUTCOME

1. Fear - of medication - drug dependency, side effects,
   effectiveness will mask pain -
   creating further damage

   - of physical activity - will increase pain particularly during recovery

   - of the cause - eg cancer, multiple sclerosis

   - of the consequences - loss of job (status and poverty)
   - disability (eg in a wheelchair)

   - of clicking in the back - frightened of damage to spine

2. Effects on the family - particularly on the partner - potential to develop learned helplessness or pain behaviour

3. Psychiatric consequences- Depression
   Substance abuse eg alcohol
   Post-traumatic stress disorder

4 Previous psychiatric history

5. Other - Job dissatisfaction, litigation / compensation

Table 15

Facilitating return to employment

The employers role

Take an interest in the patient - contact them when they are off sick - offer support

Offer assistance of the Occupational Health Service if available

Offer ergonomic advice at the work site

Allow a phased return to work
- facillitate travel at non-peak times
- minimise stress
- accept that the patient may need less demanding work both physically and emotionally short term

The health professionals

Advise partner/spouse on safe activities, specify any risk factors and discourage excessive protection

Discuss the ‘side-effects’ of being ‘off sick’ and encourage a positive view of work

Liaise with employers about above recommendations

Encourage the patient to accept that returning to work is unlikely to aggravate the cause of the pain

Offer analgesia to facilitate getting fitter and to lessen pain at work

If physically demanding work, consider a surgical corset or a weight-lifters belt

Offer continued support for 1-2 weeks after return to work to ensure work patterns safely re-established if no occupational health service

From Frank AO [57]

Abbreviations

CBT	Cognitive behavioural therapy
COX	Cyclo-oxygenase
GP(s)	General practitioner(s)
MRI	Magnetic Resonance Imaging
NHS	National Health Service
NSAIDs	Non steroidal anti-inflammatory drugs
NSLBP	Non specific low back pain
TCAs	Tricyclic anti-depressant compounds
TENS	Transcutaneous electrical nerve stimulation
UK	United Kingdom
USA	United States of America

Glossary of terms

Acute pain: from 0-7 days duration (pain-free at onset)

Acute on chronic pain: significant exacerbation of pre-existing pain

Allodynia: pain stimulated by minor stimulation of the skin.

Back school: outpatient programme of treatment emphasising educational management

Chronic pain: duration of pain over 3 months

Chronic pain syndrome: psychological and social consequences of chronic pain influencing behaviour

Hyperpathia: A painful syndrome characterised by an abnormally painful reaction to a stimulus, especially if repetitive, as well as an increased threshold [165].

Intensive rehabilitation: Multiprofessional combination of skills and therapeutic modalities to minimise pain and disability and improve function [58]

Intractable pain: failed conservative treatment of chronic pain [58].

Lumbar segment: two adjacent vertebrae and their intervening soft tissues [59]. (the five lumbar vertebrae are linked by intervertebral discs anteriorly, two synovial facet joints posteriorly and supporting structures including ligaments and muscles).

Nociceptive pain: that arising from mechanical or other stimuli that could cause tissue damage These stimuli act on peripheral pain receptors to give activity in nerve fibres [166].

Pain: An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage [165].

Subacute pain: from 7 days to 3 months duration {1}