

Regular Review

Low back pain

Andrew Frank

The studies reviewed here show that the duration and severity of individual episodes of back pain can be lessened, reducing recurrences and their cost in terms of suffering and lost work. Frank examines differential diagnosis; acute, chronic, and intractable pain; and service implications. Modern management emphasises self care, and bed rest should usually not be longer than 48 hours. A return to physical fitness and other activities, including employment, is actively encouraged. Medication has a role in facilitating these objectives. Two points are especially emphasised: strategies to manage low back pain must be long term and preventive; and the responsibility to keep fit, maintain an exercise programme, and remain relaxed so as to avoid physically stressing the spine is that of the individual, not of the professionals.

Low back pain was recognised in *The Health of the Nation* to be important but was not given priority status as it was thought to be impossible to define targets for national achievement.¹ This was surprising in view of the scale of the low back pain epidemic (box A)² and in the light of work which is reviewed here. Calculations (of lost output, for example) ignore the costs of litigation and of health care as well as the horrendous effects on individuals and their families. As back pain predominately affects those of working age it has disproportionate effects on the economy. It is more likely to disrupt the lives of those doing heavy manual work, particularly as smoking (a known risk factor for back pain^{3,4}) is more prevalent in the lower socioeconomic groups.

Millions of people suffer from back pain in the United Kingdom each year.^{5,7} The load on outpatient physiotherapy departments is enormous.⁸ (The complexities of assessing the impact on health care are discussed in detail by Wood and Badley.⁹) Many

Box B: Terminology

Acute pain	Pain of 0-7 days' duration (pain free at onset)
Acute on chronic pain	Significant exacerbation of pre-existing pain
Subacute pain	7 Days to 3 months' duration
Chronic pain	Duration over 3 months
Chronic pain syndrome	Psychological and social consequences of chronic pain influencing behaviour
Intractable pain	Failed conservative treatment of chronic pain
Back school	Outpatient programme of treatment emphasising educational management
Intensive rehabilitation	Multiprofessional combination of skills and therapeutic modalities to minimise pain and disability
Lumbar segment	Two adjacent vertebrae and their intervening soft tissues

Box A: Consequences of the back pain epidemic

Sickness absence—52.6 million certified working days 1988-9 (largest single cause; 12.5% of total sick days)

Lost output—estimated loss (1987-8) £2000 million

General practitioner consultations—estimated 2 million annually

Hospital outpatient consultations—estimated 300 000 annually

Hospital inpatient episodes—estimated 100 000 (1989-90)

Severe disability—50-1000 people severely affected in an average health district of 250 000 population

people who have low back pain are likely to be out of work, taking medication, and probably making demands on both primary and secondary health care^{7,9} as well as the private sector (both orthodox and heterodox practitioners).

Defining low back pain is difficult.¹⁰ In this review "low back pain" refers to the symptom complex in which pain is localised to the lumbar spine or referred to the leg or foot and where other specific conditions causing such pain have been excluded—non-specific low back pain. As pain from structures other than discs, such as facet joints, may refer to the distal leg and foot,¹¹ "leg pain" is used instead of sciatica. Other terminology used in this review (box B) has been modified from the report of the Quebec task force, which defined the transition from the category of subacute to chronic pain at seven weeks on the assumption that healing will have taken place by seven weeks and thus pain should have disappeared.¹⁰ Whether it is realistic to assume this timescale for the healing of tissues that are being continuously mechanically stressed is questionable. It must be emphasised that the precise timings suggested in this paper are less important than the idea that the pattern of underlying spinal dysfunction will change over time. Health workers must adopt strategies that allow for this.

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Box C: Some causes of low back pain

Mechanical or degenerative:

Muscles and ligaments (hypermobility, for example)

Joints

Discs

Other structural (spinal stenosis, for example)

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:

Sickle cell disease

Vascular

"claudication"

Course of low back pain

Pain may arise from any part of the lumbar segment, and it is not usually possible to isolate its precise source. Most "mechanical" pain is presumed to arise from excessive physical stress on normal spinal structures or normal physical forces acting on abnormal structures.¹² For most patients it is only when disc degeneration or osteoarthritis of the facet joints, or both, results in nerve root compression that surgery for decompression is considered. Indications for surgery are reviewed elsewhere¹³; figure 1 shows the underlying basis of this symptom.

Most episodes of acute low back pain settle within two weeks. The crucial time seems to be between two and 7-12 weeks, when pain that should be settling fails to do so.¹⁴⁻¹⁶ The Quebec task force recommends that all patients with subacute pain not settled within seven weeks should see a specialist,¹⁰ but even specialist management may lack good rationale and use methods that have not been well validated and may be deleterious.¹⁷

J Caldwell and H J Glanville followed 373 patients under the age of 40 presenting with low back pain to general practitioners or hospital consultants in 1963 for 10 years (unpublished data). Only 11% of patients had had a single attack, and most attacks lasted less than two weeks. Only 33% had had no time off work owing to back pain over the 10 years; 3.3% of men gave up work or took early retirement, 10% took a reduction in working hours, 19% of men and 10% of women had loss of actual or potential income, and 21% changed their job. Strategies to manage low back pain must be long term and preventive.

Medical training may hinder a satisfactory therapeutic approach by concentrating on the exclusion of serious (although usually uncommon) disease (box C): patients may feel that what they need is understanding of their problems and alleviation of their symptoms. This may explain why so many people seek help from heterodox practitioners¹⁸ and their apparent success.¹⁹

Difficulties with evaluating treatments for low back pain

The clinical course of low back pain creates difficulties for the investigator. Up to 85% of patients with low

back pain cannot be given a definitive diagnosis because of the poor associations between symptoms, signs, imaging results, and pathological findings.²⁰ The intervertebral discs are now believed to degenerate before the facet joints.²¹ In chronic back pain, the intercurrent effects of exacerbations on the underlying chronic pain make assessment difficult as it is hard to distinguish chronic pain from a new attack. The assessment of pain is outside the scope of this review, but the pain or disability scores used in the best studies may not discriminate between the physical and psychological components of disability arising from low back pain.²²

Many studies have not differentiated between acute, acute on chronic, chronic, and intractable pain. Studies have not differentiated between nociceptive pain and pain where other factors may be of importance (for example, sickness behaviour), but it has been shown that some people respond to physical measures even when pain has lasted longer than one month¹⁹ or for many months.²³ In particular, studies of chronic pain have not differentiated between previously untreated chronic pain and pain that has not responded to standard conservative treatment (intractable back pain).

The scope and techniques involved in the many types of manipulation vary¹⁰ and are beyond the scope of this review. In all studies readers must note the method(s) of manipulation used.

Carette *et al* have shown the importance of a placebo.²⁴ This common response may reflect the non-specific effects of attention and caring²⁰ but also the transfer of responsibility of care from "self" to a trained practitioner.²⁵ In addition, intensity and duration of symptoms vary constantly, and acute low back pain improves rapidly for most people.

Assessing treatments for low back pain is difficult.^{10, 26, 27} Randomised controlled trials have shown benefit for some patients; most of the studies I review are of this sort.

Differential diagnosis of low back pain

A strictly medical approach to management is disadvantageous. It may concentrate on the exclusion of diseases presenting as spinal pain (box C) rather than dedicating time to helping patients understand the nature of their problem and how best they can be helped. The measures outlined by Frank and Hills (table)¹² will help, but the patient needs to take much of the control of the situation. Ultimately, patients' attitudes to avoiding aggravating factors and a positive approach—for example, to exercise^{25, 28}—may be more important than physical management.¹²

Treatable organic pathology must not be missed, yet unnecessary and costly investigation must be avoided. These requirements are best balanced by recognising the pattern of common presentations.²⁹ Though it is often diagnosed by exclusion, non-specific low back pain should be diagnosed on positive grounds (box D). Figure 1 simply shows the three important patient groups to consider. More complex algorithms can be consulted,^{29, 31} and a fuller review of the differential diagnosis is available.¹³

SPINAL CAUSES

Children and adolescents with low back pain always require investigation. Acute pain may be caused by spondylolisthesis, disc disease, or a developing scoliosis; it warrants referral to a specialist orthopaedic clinic. Adolescent discitis (Scheuerman's disease) may cause severe pain and be diagnosed only retrospectively.

Spondylolisthesis is not uncommon and is usually unrelated to low back pain. At the L5-S1 level it is

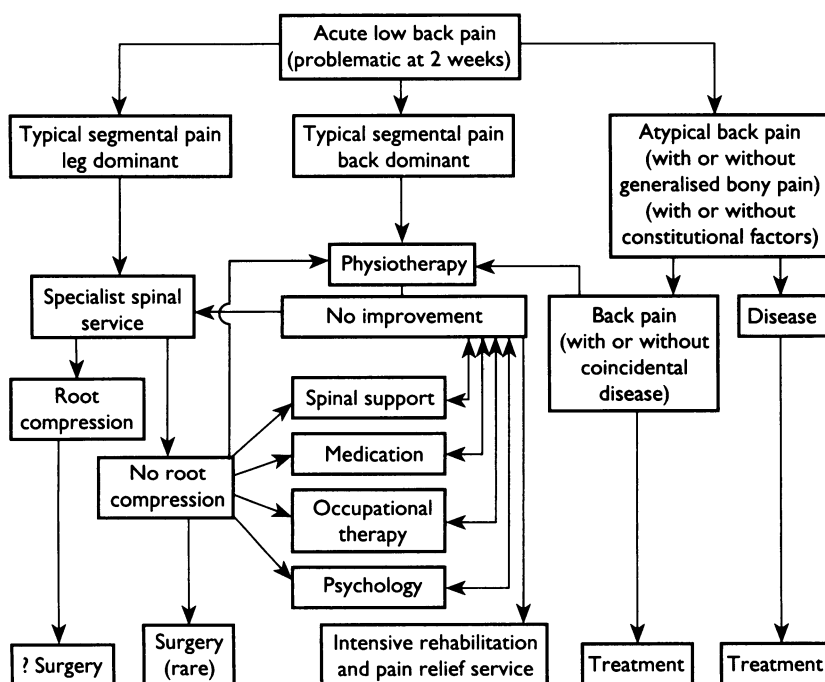


FIG 1—Algorithm for management of acute low back pain two weeks after onset

Therapeutic options in low back pain

Option	1	2	3	4
General measures:				
Strict bed rest	✓	✓	✓	
Local spinal support (corset)	✓	✓	✓	
Avoid aggravating factors such as bad working postures	✓	✓	✓	✓
Adjustment of life style (avoid rushing about, etc)	✓	✓	✓	✓
Stop smoking	✓	✓	✓	✓
Physical measures:				
Mobilisation techniques, manipulation, traction	✓	✓	✓	
Manipulation under muscle relaxant or anaesthetic	✓	✓	✓	
Exercises	✓	✓	✓	✓
Postural training and education for self care	✓	✓	✓	✓
Proprioceptive strapping	✓	✓	✓	✓
Hydrotherapy	✓	✓	✓	✓
Soft tissue techniques (massage)	✓	✓	✓	✓
Electrotherapy (interferential, etc)	✓	✓	✓	✓
Transcutaneous electrical nerve stimulation } Acupuncture			✓	✓
Medication:				
Oral:				
Pure analgesia	✓	✓	✓	
Non-steroidal anti-inflammatory drugs	✓	✓	✓	
Muscle relaxants (diazepam, etc)	✓	✓	✓	
Tricyclic drugs (amitriptyline, etc)			✓	✓
Injection:				
Local or epidural steroid with local anaesthetic	✓	✓	✓	✓
Dextrose-glycerine-phenol into soft tissues			✓	✓
Long term measures:				
Psychological:				
Behavioural approach	✓	✓	✓	✓
Developing coping strategies		✓	✓	✓
Couple therapy		✓	✓	✓
Phobia management		✓	✓	✓
Sensory deprivation		✓	✓	✓
Self help group		✓	✓	✓
Psychiatric:				
Management of depression		✓	✓	✓
Physical:				
General toughening up programme			✓	✓
Workshop:				
Developing physical tolerance			✓	✓
Developing psychological tolerance }			✓	✓
Coordinated inpatient or outpatient programme			✓	✓

1=Acute low back pain; 2=subacute low back pain; 3=chronic low back pain; 4=chronic pain syndrome

often stable and does not require follow up. At the L4-5 level, however, instability may develop and can be diagnosed by lateral lumbar spine views in flexion and extension.

LUMBAR DISC DISEASE

Lumbar disc disease is the most common major disease seen in back pain clinics. Infrequently the deranged disc compresses a nerve root; then leg pain will usually dominate the back pain. When symptoms correlate with objective physical signs confirmed by imaging, surgery should be 95% successful.³²

A central disc prolapse may give bilateral leg pain in the absence of signs and with a normal straight leg raise test. Sphincter disturbances may reflect spinal cord compression and often require emergency treatment.

SPINAL STENOSIS

Spinal stenosis is a symptom complex of root pain and sensory or motor symptoms which come on during walking and which pass off after a few minutes of sitting down or flexing the spine. Symptoms may be aggravated by extension.²⁹ Although symptoms are occasionally associated with a congenitally narrow spinal canal, more often the disease develops in later life. This may reflect disc disease or osteoarthritis of the facet joints separately or together combining with hypertrophy of the soft tissues (particularly the ligamentum flavum) to compress the cauda equina. If such compression is predominately lateral, usually because of bony outgrowths from an osteoarthritic facet joint, the term "lateral canal stenosis" is sometimes used.

ANKYLOSING SPONDYLITIS

Ankylosing spondylitis is a common condition in a back pain clinic. Patients usually present at a younger age than those with mechanical or discogenic back

pain. Early morning stiffness is a cardinal symptom and is usually relieved by movement or exercise. Early diagnosis is important as its physical treatment differs from that of non-specific low back pain and because of the family and other associations in ankylosing spondylitis. (The genetic predisposition can be found by the presence of the B 27 genotype but is not diagnostic of the disease.)

A vigorous exercise programme maintains spinal movement (preventing spinal contracture) and may inhibit calcification at the enthesis. There is usually a good response to non-steroidal anti-inflammatory drugs, particularly if a longacting preparation is taken after food at night to inhibit early morning pain and stiffness. This facilitates performance of the recommended early morning exercise programme.

INVESTIGATIONS—EXCLUDING OTHER DISEASE

The sudden onset of low back pain after age 55 warrants investigation. In a series of 900 patients presenting to an orthopaedic back clinic, 46% of those over 55 had a definite abnormality, including 11% with malignant disease.²⁹ Recurrence of previous episodes of pain rarely requires investigation. A review of 825 consecutive referrals (not all of whom had spinal pain) to a rheumatologist with an interest in back pain found only nine (1.1%) tumours.³³

In patients aged under 25, x ray examinations are indicated to exclude congenital disorders²⁹; including the sacroiliac joints on anteroposterior films may exclude ankylosing spondylitis. Otherwise x ray examinations will be needed only for reassurance that serious disease is not present, to explain possible mechanical factors to the patient, or to assist physiotherapists in their management (box E).³³ Blood tests rarely help. An erythrocyte sedimentation rate is the most helpful screening test.²⁹ Box F lists factors that should alert clinicians that the cause of back pain may be sinister.³³

People with a previous history of cancer commonly have coincidental non-specific low back pain. As radiography may not show early secondary deposits of cancer a higher threshold for radiological investigation is needed (box G).³³ A bone scan is often the most helpful investigation unless the level of the lesion is clearly established on clinical grounds.

EXTRASPINAL CAUSES OF PAIN

Three per cent of apparent back troubles seen at orthopaedic clinics are due to extraspinal causes such as retroperitoneal or pelvic disease, hip disease, peripheral vascular disease, or primary neurological disease.²⁹ Pelvic pathology is not easy to exclude from the history as many women notice their pain to be more

Box D: Features of non-specific (mechanical) low back pain

Site: One or more of:

- Discomfort across lower back
- Central pain, usually over L5
- Leg pain 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 or pain eases when patient is up and about
- Relation to posture: often aggravated by sitting or standing still and eased by walking normally

Pain that is greatly aggravated by walking raises the possibility of vascular claudication or spinal or lateral canal stenosis

Box E: Guidelines for radiological investigation

First attack of pain:

Age 0-25:

Pain resolving within 3 weeks—radiography not needed

Pain static after 3 weeks—anteroposterior and lateral views*

Age 25-55:

Pain resolving within 1 month—radiography not needed

Pain static after 1 month—long lateral view*

Age over 55:

Pain resolving within 3 weeks—radiography not needed

Pain unresolved within 3 weeks—anteroposterior and lateral views

Atypical back pain:

Well localised (1 or 2 adjacent levels)—computed tomography or magnetic resonance imaging if available

Not well localised—bone scan; if positive, computed tomography with or without biopsy under imaging control (or open).

Discogenic disease—well localised (1 or 2 adjacent levels)†

Surgery being considered

Computed tomography or magnetic resonance imaging if available‡

Intractable mechanical low back pain—stimulation followed by local anaesthetic with or without steroid injected into one or more facet joints to localise source of pain‡

Second attack of pain:

If similar to previous episode—radiography not needed

If different in character or level, as above

Indications for radiology for psychosocial management

When explaining the mechanical nature of back pain—plain films for visual display of structural normality or abnormality

To define presence or absence of discogenic disease for prognostic reasons (timing return to work, for example)—computed tomography or magnetic resonance imaging

**If sacroiliitis is suspected, dedicated views of sacroiliac joints or computed tomography may confirm if joints appear normal on anteroposterior film.*

†Some surgeons will require radiculography before operation, particularly if non-invasive investigations have suggested multilevel disease and magnetic resonance imaging is not available.

‡Discography is seldom used now for such purposes.

firm abnormalities, and computed tomography may facilitate biopsy under radiological guidance. Occasionally an open biopsy is needed to provide microbiological and histological evidence of the causal organism. Confirmation of tuberculosis is not always obtained and occasionally a trial of antituberculous chemotherapy is needed.

Brucellosis is a disease of those working in abattoirs or with animals. Back pain is generalised and often associated with systemic disease, whereas in most other infections of the spine disease is localised and gives rise to constant pain in an atypical site.

TUMOURS

Benign tumours may be found in the upper lumbar spine and are easily missed if computed tomography is not carried out at the correct levels. Myelography or magnetic resonance imaging may be required to exclude such tumours.³²

Primary tumours of the spine are rare and outside the scope of this review. Tumours secondary to myeloma, lymphoma, or carcinoma are seen at all back clinics.

BONE DISEASE

In older patients spinal collapse will usually be due to osteoporosis, but myeloma or secondary malignancy may need to be excluded (box F). Osteoporosis must be considered in women who had an early menopause. If plain films of the lumbosacral spine are normal, bone densitometry will determine the bone mass. Osteoporosis secondary to use of steroids is not uncommon.

Osteomalacia is rarely seen except in populations of immigrants from the Indian subcontinent when older women spend much of their time indoors. Raised concentrations of alkaline phosphatase when results of liver function tests are normal and bone pain is generally distributed usually confirm the diagnosis.

Paget's disease is occasionally destructive of bone. In this situation the differential diagnosis includes infection and tumour. Biopsy is sometimes required. More commonly sclerotic change is seen on x ray films, when its significance is uncertain. Activity may be found on a bone scan and when alkaline phosphatase concentrations are raised.

Sickle cell disease must also be considered as a cause of lower back pain in populations at risk of this disease.

Acute low back pain

Some episodes of acute pain have a clearly defined cause, such as the nature of work and posture,

Box F: Features suggesting malignancy

Absence of typical features (box D)

Constant unremitting pain in atypical or multiple sites

Pain unrelated to movement or posture
Generalised bone pain

Systemic or constitutional symptoms

Age over 55 with no previous similar episodes of pain

Raised erythrocyte sedimentation rate

severe in the last few days of their menstrual cycle, easing off on the first or second day of their period. This may also be noted in women with neck pain or headaches and is non-specific. Where there is doubt, abdominal and pelvic examinations are required.

INFECTIONS

Tuberculosis classically affects the lower thoracic or upper lumbar vertebrae in vulnerable groups (for example, those arrived from the Indian subcontinent less than a decade ago, frail elderly people, and people who are immunocompromised). Lumbar disc disease usually affects the L5-S1, L4-5, or less commonly the L3-4 segments.³

Other organisms such as staphylococci may be found. When abnormalities are suspected and there are no clinical changes or radiological signs of local abnormality a bone scan may be helpful. Computed tomography or magnetic resonance imaging will con-

Box G: Checklist for supporting the elderly person with back pain

Bed and chair appropriate heights for transfers; blocks to raise chair or bed

Mattress—should not sag, nor be too hard

Domiciliary physiotherapy—mobilisation (for example, walking sticks or elbow crutches to reduce mechanical stress on spine); corset may facilitate mobilisation

Bedside commode—prevents walks to toilet

Toilet—appropriate height for transfer

Stairs—Bannister(s) to prevent stairs becoming a barrier (to toilet, for example)

Self care—teach getting in and out of bed, dressing, etc—without unnecessary mechanical stress on the spine (use of stocking aid, etc)

“Helping hand” reduces bending to reach something from the floor

which must be explained to the patient. Providing the patient with self help literature at this stage may prevent referral to hospital, referral for physiotherapy, admission to hospital, and need for laminectomy.³⁴

BED REST

Minimal rest is encouraged, particularly in the absence of nerve root irritation. A random sample of patients with back pain (mostly acute) in the United States resting for two days did as well as a sample resting for seven days.¹⁴ A comparison of bed rest with physiotherapy and education in family practices in Canada showed no difference between the two groups, suggesting that bed rest was not advantageous.³⁵ The positions of rest are important—sitting often aggravates acute pain.³³

When the patient is improving, referral for physiotherapy is usually helpful (see below). Symptoms may, however, be exacerbated by sitting while travelling to hospital, particularly if an L5 or S1 root is affected; in these cases treatment at home is advised.

DRUGS

Analgesia—In severe pain, non-steroidal anti-inflammatory drugs often help.²⁶ They are the only non-opiate derivatives available giving analgesia that lasts through the night. The risks of short courses may be no more than the risks of prescribing the stronger opiate derivatives such as nefopam, meptazinol, or buprenorphine, which may be the only alternatives. Many patients require only mild analgesics, such as compound paracetamol preparations. Antiemetics are helpful in those inclined to vomit.

Other drugs—Antispasm drugs may be used in the first few days,²⁶ although non-steroidal anti-inflammatory drugs seem more appropriate. Patients who have difficulty resting may use benzodiazepine drugs for a maximum of one week. The drugs may facilitate a good night's sleep, essential for coping with the next day's pain. Patients with a history of mood disorders, insomnia, or dependency are treated more safely with a tricyclic compound with sedative properties.

Injections—Local injections of lignocaine or corticosteroid, or both, around the area of maximum tenderness^{36,37} or into the disc³⁸ or facet joint^{24,39} have not been shown to offer widespread benefit. The local effect of a mechanical stimulus may be more important than the type of drug injected,³⁶ and injections given by specialists in clinic may be more efficacious than those given in a general practice setting.³⁷ Injections by the epidural route are often given, more usually in chronic back pain.⁴⁰ Controlled trials have given contradictory results and these injections remain controversial.¹⁰

PHYSICAL MANAGEMENT

Considerable evidence supports the role of physical therapy. Increased compliance with, and better results from, physiotherapy can be obtained by giving patients self help literature and by a planned review of patients after a course of treatment. Benefits of therapy may be lost in those who do not persist with recommended treatment.⁴¹ Few studies have compared physical with non-physical methods of treating acute low back pain. Overman *et al* randomly assigned 107 patients in a "walk-in low back pain clinic" to internists or to physical therapists.⁴² The physical therapists referred more patients to physical therapy than did internists and recommended less bed rest and fewer drugs. This resulted in greater functional improvement.

Meade *et al*, in a sample of 741 patients for whom manipulation was not contraindicated (derived from hospital or chiropractic clinics), compared hospital outpatient management with that of chiropractors.¹⁹ In the group that had had acute and subacute back pain for less than one month; difference was noted only after

two years, when those treated by chiropractors seemed less disabled. A preliminary study of osteopathic manipulation in acute or subacute low back pain has suggested benefit.⁴³ Other comparisons of manipulative and non-manipulative forms of management show that manipulation may speed recovery of some patients with acute backache.⁴⁴⁻⁴⁶

Fordyce *et al* compared traditional and behavioural methods of treating acute back pain and found no difference at six weeks.²⁵ But at 9-12 months those in the behavioural group, who were given a supervised, planned withdrawal of treatment, were "less sick" than those in the group controlling their own schedules of medication, activity, exercise, and follow up. A graded activity programme with a behavioural therapy approach for those with subacute back pain improved mobility, strength, and fitness, resulting in an earlier return to work than found in a control group.⁴⁷

Patients treated with McKenzie techniques of passive extension and postural correction had better pain relief, earlier return to work, less sick leave during the initial attack, fewer recurrences during the follow up year, and easier movement when compared with those who had a one session "mini back school."⁴⁸

As cervical symptoms often coexist with low back symptoms, advice about physical and ergonomic measures must be appropriate for all parts of the spine (see fig 2). Thus, lying prone may help some people with low back pain, but aggravate neck problems that may be mild or asymptomatic. Patients with acute pain may benefit from exercises (see chronic low back pain).

ELDERLY PEOPLE

Little has been written on back pain in elderly people, but the deleterious effect of musculoskeletal disorders is important.⁴⁹⁻⁵¹ Domiciliary physiotherapy greatly improves confidence, mobility, and self image in elderly people.

If rest is required, attention must be paid to resting posture, taking pressure off protruding bony points, and adequate support during mobilisation. The domiciliary physiotherapy service may assess the patient for the ideal resting posture. Resting sitting should usually be avoided but is preferable if the femoral roots are involved. The checklist given in box G helps to ensure that the everyday stresses on the spine are minimised; advice can be given by the domiciliary physiotherapy service, social services department, or the hospital occupational therapy service separately or in combina-



FIG 2—Use of a lumbar roll to support the back; arm rest to decrease downward drag of the arm; easel to inhibit neck flexion

tion, depending on local circumstances. Prolonged rest is usually contraindicated: joints will stiffen, and it encourages osteoporosis.

Chronic low back pain

EXERCISES

Exercise regimens may aim to increase range of movement, strengthen muscles, stretch tightened structures, or toughen up the patient physically and mentally.¹² There is evidence that back extension,^{41,52} calisthenics,⁵³ and a mixed exercise regimen help people with low back pain,⁵⁴ but little evidence to support particular theoretical rationales. Patients usually have not been selected to meet criteria that would justify particular exercises. Exercises combined with behavioural methods are more effective than exercises alone, and either is more effective than inaction.⁵⁵ Exercises may increase the range of movement of the spine, but not necessarily reduce the pain and disability.⁸

Benefits of exercise may not be solely physical. In a quasi-experimental study comparing groups of nurses given aerobic exercise, instruction in lifting, and ergonomic principles with a control group, aerobic fitness seemed to improve job satisfaction as well as decreasing the duration of episodes of back pain.⁵⁶

In outpatients, intensive physical retraining consisting of pain relief, mobilisation, increasing movement, and muscle strengthening, along with work conditioning has been shown to reduce work absence.⁵⁷ The increased costs to health care were more than offset by savings in the cost of wages lost.⁵⁷ Work conditioning has not been evaluated separately but it is thought to be valuable in intensive rehabilitation settings.⁵⁸

MANUAL THERAPY AND MANIPULATION

Manipulation has been defined as an abrupt passive movement of a vertebra beyond its physiological range but within its anatomical range.¹⁰ A review of studies on manipulation showed little long term benefit,⁴⁵ but manual therapy including manipulation has been found effective in reducing pain of longer duration.^{19,23} A study of patients with acute and chronic pain showed early benefits from manipulation.⁵⁹

Individually, these studies do not prove that these forms of manual therapy are effective; all are capable of many interpretations. Together, however, they seem to show that these forms of therapy are effective. The beneficial effects on the economy of "a few days" saved for work by more effective means of treatment are potentially enormous.

OTHER PHYSICAL TREATMENTS

Corsets help some patients⁶⁰ and are often prescribed for low back pain, although criteria for their use are not clear. They should be reserved for those patients in whom attempts to mobilise the spine have failed, those with pain on physical activities (particularly at work), and those with scoliosis or unstable spondylolisthesis for whom symptoms persist and surgery is not indicated.¹² Corsets may be useful adjuncts to other forms of physical management, but for unselected patients they are likely to be less effective than active therapy.⁶¹

Traction may be helpful in a few patients, although its benefits have not been shown in controlled studies. It enforces a prescription of bed rest,¹⁷ although this may be counterproductive.

HETERODOX MANAGEMENT

Chiropractic and osteopathic management has been reviewed elsewhere.⁶² A recent comparison of hospital outpatient management with chiropractic management showed major long term benefit in those having

chiropractic manipulation compared to a group given various "orthodox" treatments including hydrotherapy and traction in addition to manipulation and mobilisation by Maitland or Cyriax techniques (but not necessarily by therapists trained in manual techniques).¹⁹ Doctors are advised to recommend heterodox treatment only if the practitioner is a member of a recognised professional association.⁶² The only study of osteopathic manipulation in chronic back pain has not shown evidence of benefit.⁶³

MEDICATION

There is no rationale for use of muscle relaxants in patients with chronic pain. Tranquillisers should be avoided because of their increasingly recognised propensity to cause drug dependency. Analgesics and non-steroidal anti-inflammatory drugs have their uses (see above), as have tricyclic antidepressant compounds (see below).

Chronic intractable pain

A few patients have persisting disabling pain despite therapy, which has usually included non-steroidal anti-inflammatory drugs, analgesics, physiotherapy, and often advice from heterodox practitioners. Investigations (often including radiculography) have usually had negative results. Once spinal and non-spinal disease and direct nerve root involvement have been excluded, patients should be considered as having failed conservative treatment.

At this stage it has to be determined whether physical or psychological factors are most likely to be influencing current symptoms.^{12,15} Often they will coexist and the best management combines the two approaches, as occurs in most back schools and rehabilitation programmes.

PHYSICAL MANAGEMENT

When pain is episodic and related to movement or posture, physical issues are likely to predominate (box H). Management consists of education about the relevant mechanical and ergonomic factors.²⁵ Lost sleep due to pain requires analgesia and should be differentiated from insomnia.

Transcutaneous electrical nerve stimulation is now widely used to control pain for which conservative measures were unsuccessful and surgery is not contemplated.^{64,65} Proof of efficacy is still lacking.^{54,66} Acupuncture seems to be effective and is offered by pain clinics and some physiotherapy departments.^{66,67} Currently it is not possible to predict who will do well with either transcutaneous electrical nerve stimulation or acupuncture.

DRUG THERAPY

Only two drug regimens have been shown to help chronic intractable pain. Injections of a "sclerosant" mixture of phenol, dextrose, glycerine, and water into the supraspinous, iliolumbar, and sacroiliac ligaments are likely to be effective, although follow up beyond 12 months has not been reported.^{59,68} Tricyclic antidepressant compounds have been shown to be effective for some patients who may or may not be depressed and for those known to have a physical basis for their pain.⁶⁹ Appropriate warnings about sedation and a dry mouth must be given. Patients need reassuring that tricyclic antidepressants are not addictive and are not being prescribed for psychiatric purposes.

PSYCHOLOGICAL AND SOCIAL ASPECTS OF MANAGEMENT

An appreciable number of patients have continuous pain which does not alter over the 24 hour period. They may be suffering from the "pain or illness behaviour syndrome," sometimes considered as "learnt helplessness."

Box H: Physical barriers to successful outcome

Habitual poor posture at work or while doing housework

Repetitive lifting

Repetitive poor posture at leisure

Inappropriate activities

Inappropriate bed or mattress

Sleeping unsupported or in inappropriate position

Getting in or out of bed incorrectly

Sitting for longer than half an hour (particularly when driving)

Recurrent bending (for example, when brushing teeth)

Stopping exercise regimen when "better"

Not taking medication or using corset

General lack of physical fitness

ness."^{12 30} The importance of meeting the spouse or "other significant" person cannot be over-emphasised.⁷⁰

Other psychological factors which may inhibit resolution of symptoms are listed in box I. Many are amenable to psychological or psychiatric intervention. Hypnosis, relaxation, and sensory deprivation have been shown to be helpful in chronic (and probably intractable) low back pain.^{71 72}

Self help may be facilitated by literature or self help groups. Sometimes specialist counselling is required from a social worker or a psychologist, who may help overcome some of the problems. The patient may not recognise for some time that psychosocial problems predominate. Usually, physical and behavioural^{25 47 55} approaches are combined, and the physiotherapist is often essential, even if the programme does not have a major physical component, to "allow" the patient to get better.

In acute stages patients often prefer professionals to take responsibility for their back care, which is therapeutic,²⁵ but this responsibility has to be transferred back to patients as pain becomes chronic and intractable. Thus responsibility to keep fit, maintain their individual exercise programme, and remain relaxed so as to avoid physically (and ergonomically) stressing the spine is that of the individual, not of the professionals.

BACK SCHOOL

A "back school" may be any programme with an educational content: a one session programme,⁴⁸ variable sessions as an outpatient,⁷³⁻⁷⁵ or an inpatient programme.⁷⁶ In this review it refers only to outpatient education with or without concurrent treatment. Programmes of three or four sessions^{73 74} and 15 sessions⁷⁶ have been shown to decrease back pain and disability.

INTENSIVE REHABILITATION

A model programme was evaluated by Harkapaa *et al* in Helsinki, where 459 patients were randomly

Box I: Psychological barriers to successful outcome

Fear

- Of medication:
 - Drug dependency
 - Side effects
 - That effectiveness will mask pain or create further damage
- Of physical activity:
 - That it will increase pain, particularly during recovery
- Of the cause:
 - That it might be cancer, multiple sclerosis, etc
- Of the consequences:
 - Loss of job (status and poverty)
 - Disability (being in a wheelchair)
- Of clicking in the back:
 - Frightened of damage to spine

Effects on the family

- Particularly on the partner
- Potential to develop learnt helplessness or pain behaviour

Psychiatric consequences

- Depression
- Phobic disorders
- Substance abuse—for example, alcohol
- Post-traumatic stress disorder

Previous psychiatric history

Other

- Job dissatisfaction
- Litigation and compensation if pain continues

Box J: Suggested audit measures

(Responsibilities of purchasers of health care)

Prevention

- 1 Targeted programmes to prevent smoking in heavy manual workers and other risk groups (for example, nurses)
- 2 Appropriate action to minimise risk in the NHS workforce—for example, use of space or hoists in hospitals
- 3 Provide advisory service to local employers on ergonomics in the workplace

Management

- 1 Provide access to postgraduate trained specialist spinal therapists
- 2 Provide literature appropriate for use in either primary or secondary care
- 3 Provide access to clinical psychology services to advise primary and secondary sectors on behavioural approaches to management
- 4 Provide access to skilled advice within three months of onset of acute low back pain
- 5 Adequate TENS equipment available

Evaluation

- 1 Inpatient versus outpatient rehabilitation
- 2 Different methods of manipulation or mobilisation
- 3 Relative importance of physical and psychological aspects in development of chronic or intractable low back pain
- 4 Differences between an individual's personality and therapeutic needs and outcome (for example, compliance)

allocated into control, inpatient, or outpatient groups.⁷⁶ Each contained physical therapy, relaxation, group work with a psychologist to develop coping strategies, and education in the role of ergonomics and self care in the prevention of low back disability. It is not clear whether the superior inpatient treatment was cost effective, but work absence was reduced when assessed after 2.5 years. After inpatient rehabilitation (with subjective relief from pain and objective improvements in physical function) only a minority of patients may succeed in returning to work.⁷⁷ This view has been challenged in an uncontrolled evaluation of a three week outpatient "functional restoration programme," which resulted in an 85% return to work by one year.⁷⁸

For those who lose their job because of chronic back pain, referral to a disablement resettlement officer at the local job centre may facilitate retraining or a return to different work.

Service implications

Until recently it was assumed that no particular treatment had been shown to be effective. Bed rest, relief of symptoms, and exclusion of other disease were the prongs of therapy, with surgery for those requiring it.

Delays in referral for specialist advice, delays in being seen in hospital, and delays in the provision of treatment are all likely to contribute to non-resolution of acute or subacute back pain, increasing the pool of chronic pain patients and the risk of pain becoming intractable, with the consequent suffering shared by the patient's family. These people may progress to illness behaviour, becoming more costly for employers and the state. Research outside the United Kingdom suggests that early multiprofessional integrated programmes (within three months) may halt this process.

There is now published evidence that back pain and disability can be ameliorated and that further episodes can often be minimised by professional intervention at the start of the first attack. Absence from work can be

shortened through physiotherapeutic and chiropractic (and probably osteopathic) manipulation, physical training, a variety of exercise programmes, and multi-professional rehabilitation. Minimal rest and a planned withdrawal of support are important developments whose benefit has been shown.

The development of proper diagnostic and treatment protocols can decrease accidents and lost work days and be cost effective⁷⁹ if costs to all sections of national life (state and industry) are considered. A nationwide audit (see box J) of current health service provision for back pain is likely to show that services have not developed in line with the research evidence of efficacy, exposing British industry and the public sector to unnecessary disadvantage through avoidable sickness absence.

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Russian Report

Personalia and the current health crisis

Michael Ryan

Recent changes in the Russian government introduced by Boris Yeltsin include the appointment of Eduard Nechaev as health minister at the beginning of this year. The appointment received little publicity in the West, although his predecessor was sacked after only one year for failing to make any effort to improve health care. The challenges facing the new minister are enormous. Not only does he have to introduce a new medical insurance system but he has to tackle the problems of falling population, rising childhood illness linked to poor diet, and the spread of polio and diphtheria. It remains to be seen whether his experience in the military medical service has equipped him for the job.

At the start of 1993 the line up of Boris Yeltsin's embattled government included not only a new prime minister but also—virtually unnoticed in the West—a new minister for health. This post had been vacant for over two months, and the reason for this is easily found. The shortage of public money for this sector and its administrative disarray, plus appalling morbidity and mortality statistics, meant that the appointee was being offered what amounted to a bed of nails. Indeed, one potential incumbent apparently declined the job with the words: "Do you think that I'm a kamikaze?"

The person eventually appointed was the relatively unknown Eduard Aleksanrovich Nechaev, who had made his career in the military medical service. The fact that a doctor was chosen to head up the health service represents the continuance of a Soviet constitutional practice which recent political evolution has not yet modified. Indeed, it would be unrealistic to suppose that in the short term Russia will develop a British style multiparty system which makes possible ministerial careers for generalists who expect to move from post to post as they "climb the greasy pole."

Although Nechaev has not worked as a civilian medical administrator, he was presumably deemed to have shown high qualities of leadership and competence in running a large scale organisation during his tenure of senior posts. Before expanding on that point, though, it is appropriate to ask what happened to his predecessor.

A minister who failed

Some of the changes to the government team can be explained as an expression of compromise by President Yeltsin to a parliament in which reactionary forces need to be placated. The most striking example of such

a logic occurred in December of last year when the radical Yegor Gaidar, who had espoused shock therapy for the Russian economy, was removed as acting prime minister and replaced by the opaque but pragmatic Victor Chernomyrdin. That action was almost certainly calculated to avert heightened political instability. However, the same interpretation cannot be put on the sacking of health minister Andrei Vorobyov, who had been appointed only about a year earlier.

As the Russian newspaper *Izvestiya* reported in October last year, Vorobyov was dismissed by presidential decree the day after he had attended a meeting of heads of ministries. Coming under strong criticism for his report on health care, he had a heart attack, but the reasons for his dismissal were not divulged. In its report the newspaper implies a mystery by pointing out that "problems in the health care system are no more daunting than in, for example, the sphere of education."

A few days later *Pravda* published an investigative article which had been prompted by phone calls from readers. The gossip culture had linked Vorobyov's dismissal to the allegation made by one of his deputies that the parliamentary speaker (Ruslan Khasbulatov) had been under the influence of drugs. To discover the truth, *Pravda* approached an authoritative informant A A Askalonov, chairman of the Supreme Soviet's committee on health care, social security, and physical culture.

What Askalonov said added up to a damning assessment of the former health minister. During a year in office Vorobyov "took no constructive steps to improve the health care of the people in our state." From the start he had adopted the position of an observer on the sidelines, taking the view that work on laws concerning health care was the responsibility of parliament and nothing to do with the executive.

Insurance medicine

His position might have been partly excused by the fact that the division of functions between the legislature and the executive is somewhat blurred at the moment. Nevertheless, he was also inactive in an executive task that clearly fell within his remit.

In June 1991 President Yeltsin had signed a law which was intended to change the financing and organisation of health care fundamentally by introducing a system of medical insurance to complement the traditional publicly financed health care. Vorobyov had an unambiguous responsibility for detailed planning and administrative preparations but he adopted a

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