

How patients react to low back pain

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One of the fascinations of medicine is how people react very differently to pain. We all agree in principle that medical treatment should be directed to the needs of the individual patient rather than simply to the spine. To put this principle into practice, clinical assessment should provide as much information about how the patient is reacting to and coping with the pain as it does about the physical pathology in the spine. Routine clinical interview and examination can provide a great deal of information about the patient's illness behavior. It is particularly important to distinguish the symptoms and signs of illness behavior and those of physical disease. This greatly clarifies physical assessment for surgical decision making and may also provide the first clinical clue that there is a need for more detailed psychological assessment.

Illness behavior

Clinical observation of illness behavior is most simply illustrated by the pain drawing (Figure 1). Patients willingly record their pain on an outline of the body, but the way in which they draw the pain is strongly influenced by emotional distress (Ransford et al. 1976). Poorly localized, widespread and nonanatomical drawings, expansion or magnification of pain to other areas of the body or outside the body outline, and additional emphasis or comment on the severity of the pain all reflect the patient's distress rather than the physical characteristics of the pain. So the patient's description of pain communicates both physical information about the pain and psychological information about their response to the pain.

Behavioral symptoms

The way in which most patients describe their symptoms approximates to anatomical and pathological patterns of disease. Occasionally, however, patients offer descriptions which clearly do not fit clinical experience. These behavioral symptoms and signs are vague and ill-localized and fit regional or body image patterns rather than neuroanatomical patterns. They lack the normal relationship to time and physical activity

and are difficult to fit to any reasonable anatomical or pathological mechanism. We have been able to identify a group of such symptoms which are physically inappropriate and much more closely related to the patient's distress (Waddell et al. 1984):

1. *Pain at the tip of the tailbone.* Coccygodynia can be caused by local direct injury. Coccygodynia in a patient with backache however is often associated with other behavioral symptoms.

2. *Whole leg pain.* The whole leg becomes painful in a stocking distribution usually from the groin down or below the knee. Such regional patterns of pain do not fit any nerve anatomy.

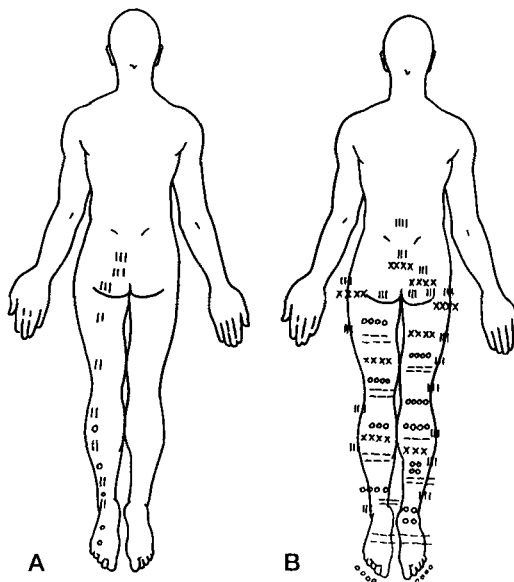


Figure 1. Examples of "normal" (A) and "abnormal" (B) pain drawing. The pain drawing provides clinical information about the physical and emotional characteristics of the patient's pain. Patient A describes the anatomical pattern of S1 pain and paresthesia from a disc prolapse. Patient B with simple backache does not have a cauda equina syndrome but is communicating distress. Many patients do both to varying degrees. II pain; ○ pins and needles; x ache; = numbness. Reproduced from Brit Med J 1984; 289: 739-741 with permission.

3. *Whole leg numbness.* The whole leg goes numb or dead in a stocking distribution. It usually comes and goes. The distribution again contradicts normal nerve anatomy.

4. *Whole leg giving way.* The whole leg gives way or collapses although very few patients actually fall to the ground. Again the essential feature is the regional nature of the symptoms which is clearly different from a localized muscle weakness.

5. *Absence of spells without pain.* Pain which has persisted for many years and become progressively worse without the normal variation and remissions with time.

6. *Intolerance of and reactions to treatments.* Our treatment for backache is not very effective so we should not blame the patient if the pain does not improve. Side effects of treatment are also quite common but are usually minor. Beware however of the patient in whom every treatment has to be stopped because it aggravates the pain or causes severe side effects or complications.

7. *Emergency admissions to hospital.* Simple backache is so severe that the patient has to be rushed into hospital as an emergency. This may reflect medical practice as much as patient behavior. Nevertheless, it is a measure of the patient's distress and emotional reaction to the pain.

These behavioral symptoms are clearly separate from the common symptoms of physical disease and are closely related to psychological distress. They are simple and reliable to assess as part of the routine clinical history. Indeed most of them are elicited by the standard medical interview and it is simply a matter of recognizing that these are behavioral rather than physical symptoms. They form a closely related homogeneous group of symptoms which must be considered as a whole. Assessment should be based on the whole clinical picture and isolated symptoms should be ignored. They are only inappropriate to simple backache or sciatica and may not be inappropriate in other situations. They should not be regarded as behavioral until spinal pathology has been excluded.

Nonorganic responses to examination

In the same way we have identified and standardized a group of nonorganic signs or behavioral responses to examination (Waddell et al. 1980). Physical findings on medical examination are frequently regarded as objective. But when one human being examines another human being who is in pain and in the process may deliberately elicit pain, for example when looking for tenderness or testing straight leg raising, then the examination should not only detect objective physical abnormality but also provide information about the

patient's response to pain. Behavioral responses to examination include:

Tenderness	superficial nonanatomical
Simulation	axial loading simulated rotation
Distraction	straight leg raising
Regional	weakness sensory disturbance
Overt pain behavior	guarding bracing rubbing grimacing sighing

Tenderness related to physical disease is usually localized to a particular skeletal or neuromuscular structure. Non-organic tenderness may be superficial or non-anatomical.

Superficial tenderness. The skin is tender to light pinch over a wide area of lumbar skin. A localized band in a posterior primary ramus distribution may be caused by nerve irritation and should be accepted as physical.

Non-anatomical tenderness. Deep tenderness over a wide area is not localized to any musculoskeletal anatomy but extends to the thoracic spine, sacrum or pelvis.

Simulation tests give the impression that a particular manoeuvre is being carried out when in fact it is not. Usually this is based on movement producing pain. On formal examination a particular movement causes the patient to report pain. That movement is then simulated without actually being performed. If pain is reported it is physically inappropriate. It is essential to minimize suggestion.

Axial loading. Low back pain reported on vertical loading over the patient's skull by the examiner's hands. Neck pain is common and should be accepted as physical but organic lumbar pain is surprisingly rare even in the presence of serious spinal pathology such as tumor or infection.

Simulated rotation. Back pain is reported when the shoulders and pelvis are passively rotated together in the same plane while the patient stands relaxed with the feet together. In the presence of nerve irritation, leg pain may be produced and should be accepted as physical.

Distraction tests. A positive physical finding is demonstrated in the routine manner and this finding is then checked while the patient's attention is distracted. Distraction must be non-painful, non-emotional and non-surprising. In its simplest and most effective form, this consists of indirect observation—simply observing the patient throughout the period that he or she is in the examiner's presence, while unaware of being

examined. During examination, parts of the body other than the particular part being formally tested should also be observed. Any finding that is consistently present is likely to be physically based. Findings that are present only on formal examination and disappear at other times are behavioral.

Straight leg raising is the most useful distraction test. A distressed patient may show marked improvement in straight leg raising on distraction compared with formal testing. There are several variations based on sitting. This is commonly known in North America as the flip test.

Regional disturbances involve a widespread region of neighboring parts such as the leg below the knee. The essential feature is divergence from accepted neuroanatomy.

Weakness is demonstrated on formal testing by jerky giving way of many muscle groups which cannot be explained on a localized myotomal basis.

Sensory disturbances include altered sensation to light touch, pinprick and sometimes other modalities fitting a stocking rather than dermatomal pattern.

Giving way and sensory changes commonly affect the same area, and there may be associated non-anatomical regional tenderness. Care must be taken, particularly in patients with spinal stenosis or who have had repeated spinal surgery, not to mistake multiple nerve root involvement for a regional disturbance.

Keefe and Block (1982) have now developed a simple and reliable system of observing overt pain behavior commonly displayed by patients with back pain.

Guarding; abnormally stiff, interrupted or rigid movement while moving from one position to another.

Bracing; a stationary position in which a fully extended limb supports and maintains an abnormal distribution of weight.

Rubbing; any contact between hand and back, i.e., touching, rubbing or holding the affected area of pain.

Grimacing; obvious facial expression of pain which may include furrowed brow, narrowed eyes, tightened lips, corners of mouth pulled back and clenched teeth.

Sighing; obvious exaggerated exhalation of air usually accompanied by shoulders first rising and then falling. Cheeks may be expanded.

These non-organic or behavioral signs are again clearly separable from the standard signs of physical disease and are closely related to emotional distress. Although they can occur in a medicolegal context, they are also commonly seen in the Problem Back Clinic in patients with no legal proceedings or compensation claims. They form part of complex emotional and behavioral patterns. They must not be over-interpreted simplistically as faking and it is essential to assess the whole clinical picture before drawing con-

clusions. These are all methods of assessing illness behavior or, more specifically, illness presentation in the context of a medical interview and examination.

Illness behavior in low back pain can now be assessed in a variety of ways:

Pain drawing (Ransford et al. 1976).

Behavioral symptoms (Waddell et al. 1984).

Nonorganic or behavioral signs (Waddell et al. 1980).

Overt pain behavior (Keefe and Block 1982).

Use of walking aids.

Downtime—the average number of day-time hours spent lying down (Rosenstiel and Keefe 1983).

Psychological distress

From an extensive review of previous work and his own detailed clinical studies Sternbach (1974) concluded that the most important psychological disturbances associated with pain were anxiety in acute pain and depression in chronic pain. Main (1983) also found that the most important psychological disturbances in chronic low back pain were increased bodily awareness which is related to anxiety, and depressive symptoms. These are best regarded clinically as forms of distress, a simple emotional reaction to pain and disability. Psychological distress can not be assessed accurately by clinical impression but is best measured by two simple questionnaires: *The modified somatic perception questionnaire* (Main 1983), and *A Depressive Inventory* such as that described by Beck (1991) or Zung (1965). Both are well established in low back pain.

It is a common clinical observation and there is now also increasing evidence that patients' own attitudes and beliefs are a major influence of how they react to pain. Specific fear-avoidance beliefs about low back pain may be one of the most powerful influences on disability and workloss. They can be detected by a few simple clinical questions or measured by a simple one page questionnaire (Waddell et al. 1992). Fear-avoidance beliefs are particularly important as they are often aggravated by ill-considered medical information about discs and degeneration and standard medical advice to avoid physical activities, rest and stay off work.

Conclusion

Medicine is about people and about human illness, not about disease. We all agree in principle with the need to treat people rather than spines. One of the starting points to put this into practice is to improve clinical assessment of how patients react to low back pain.

References

- Beck A T, Ward C H, Mendelson M M, Mack J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatr* 1961; 4: 561–71.
- Keefe F J, Block A R. Development of an observation method for assessing pain behavior in chronic low back pain patients. *Behavior Therapy* 1982;13: 363–75.
- Main C J. The modified somatic perception questionnaire. *J Psychosomatic Res* 1983; 27: 503–14.
- Ransford A O, Cairns D, Mooney V. The pain drawing as an aid to the psychological evaluation of patients with low back pain. *Spine* 1976; 1: 127–34.
- Rosensteil A K, Keefe F J. The use of coping strategies in chronic low back pain: relationships to patient characteristics and current adjustment. *Pain* 1983;17: 33–44.
- Sternbach R A. Pain patients: traits and treatment. Academic Press New York 1974.
- Waddell G, McCulloch J A, Kummel E, Venner R M. Non-organic physical signs in low back pain. *Spine* 1980; 5: 117–25.
- Waddell G, Main C J, Morris E W, Di Paola M P, Gray I C M. Chronic low back pain, psychologic distress, and illness behaviour. *Spine* 1984a; 9: 209–13.
- Waddell G, Somerville D, Henderson I, Newton M, Main C J. A fear avoidance beliefs questionnaire (FABQ) and the role of fear avoidance beliefs in chronic low back pain and disability. *Pain*, in press, 1992.
- Wiltse L L, Rocchio P D. Pre-operative psychological tests as predictions of success of chemonucleolysis in the treatment of the low back syndrome. *J Bone Joint Surg (Am)* 1975; 57A: 478–83.