

DIAGNOSTIC CRITERIA FOR WORK-RELATED UPPER LIMB DISORDERS

ACCORDING to the most recent figures, a modest increase in prescribed industrial disorders of the forearm attributable to occupation has occurred in the UK (see Table I). The feeling 'on the ground', however, is of a much more dramatic increase in occupational arm pain both presenting to clinicians and passing through the legal system. Although this discrepancy has not been documented, it may be because the majority of occupational arm pain is not 'prescribed' and comes under the generic term of 'non-specific work-related upper limb disorder' (WRULD). What exactly is meant by this term, what are the clinical and diagnostic features, how reliable are diagnostic criteria, what is their sensitivity and specificity, and is a diagnostic test available?

What is meant by WRULD? A general classification is given in Table II. Specific soft-tissue syndromes are usually classified anatomically—on the whole, there is little disagreement about the clinical criteria for diagnosis. However, diagnostic criteria for non-specific arm pain are often disputed, and clinicians polarize into those who deny that the disorder is real and those who accept that pain and appropriate occupational exposure are sufficient for diagnosis. This dichotomy was well illustrated in a recent survey of clinicians undertaken in the North East [2]: of 54 respondents, 23 felt that 'repetitive strain disorder' (RSD) was a genuine condition, 27 felt that it was not and there were four non-responders. The survey may have employed flawed sampling, but the results suggested that orthopaedic surgeons were more likely than rheumatologists and occupational health physicians to deny the existence of RSD.

The opposing views appear in the courts. During the High Court judgement of *Mughal vs Reuters*, an expert witness for the defence said that repetitive strain injury, or 'RSI', was not a disease, but a label used to describe a complex phenomenon with social, psychological and economic facets in which claims for compensation for injury at work occur in epidemics; the prosecution was less convincing, such that Judge Prosser was 'no wiser as to what RSI was meant to be' [3].

In the North East survey [2], the majority of respondents who recognized a condition loosely labelled as RSD felt that the diagnostic criteria were: (a) repetitive hand/finger action at work (the frequency varied from more than once per second to between once per second and once per minute); (b) onset of symptoms at work, amelioration of symptoms after work and at weekends; (c) pain in the arm; (d) tenderness in the arm. It is possible to divide non-specific symptoms into those attributable to muscles and those attributable to nerves (Table III). Muscle symptoms include aching, tiredness, cramp, weakness, tremor and loss of function (e.g. grip); nerve symptoms include numbness, paraesthesiae (pins and needles), allodynia, subjective swelling, burning and

inco-ordination. None of these symptoms have been systematically studied for reliability, sensitivity or specificity, although an attempt has been made to standardize a screening questionnaire for occupational arm pain and test-retest reliability studies have been carried out [4]. There is a paucity of physical signs in non-specific WRULD. Muscle tenderness is the principal sign [5]. Loss of grip and pinch strength is an early sign [6], and offers further possibility for study such as quantitative and spectral electromyography. There is evidence of vasomotor abnormality in some cases [7]. Nerve dysfunction may cause inco-ordination, but this is hard to quantify objectively; R. D. Wigley (personal communication) suggests recording the time to touch, successively, the finger tips with the thumb tip, but more sophisticated devices for movement analysis may be necessary. No sensory abnormalities have been found. Reports of abnormalities in serum creatine phosphokinase [8] and muscle morphology [9] are unconfirmed.

The lack of physical signs and the absence of recognizable pathology underlie the polarity of opinion on non-specific WRULD. To accept this condition, it may be necessary to abandon the medical model of disease [10]. Using agreed but purely descriptive criteria accords with clinical practice and is in the best tradition of medicine. Simply because investigational or pathological data are not available to confirm the clinical picture does not mean that the condition does not exist. Clearly, the condition does exist phenomenologically (a phenomenon is defined by the *Oxford English Dictionary* as 'a thing that appears or is perceived or observed, applied chiefly to a fact or occurrence, the cause of which is in question'). The analogy with non-specific low back pain is compelling: diagnosis is based on symptoms, physical signs may be sparse and unreliable [11], no specific diagnostic test is available and psychosocial factors are prominent. Again, by analogy, early physicians relied heavily on their powers of observation and classified disorders in a descriptive way; much of this careful clinical observation can now be corroborated pathophysiologically, for example, see Chapter 9 in the biography of William Heberden [12].

The dichotomy of opinion noted above may also result from a pragmatic, if unconscious, use of probability theory by the assessing clinician. For screening, a test (or clinical symptom or sign) should have high sensitivity, i.e. a low false-negative rate: some cases who do not have the disease are bound to be included. High specificity (the true negative rate) assures that the test is virtually never positive in patients who do not have the disease, but it may miss a good proportion of those who do have it. It is clear that clinicians working closer to the workforce use less stringent criteria than those working in secondary or tertiary care or medico-legal practice, and this is

TABLE I

New cases of prescribed industrial diseases 1988-1995 [1]: Note that carpal tunnel syndrome (A12) was 'prescribed' in relation to handheld vibrating tools in 1992

	Cramp of hand or forearm	Inflammation of tendons of hand, forearm or tendon sheaths (tenosynovitis)	Carpal tunnel syndrome
Number	A4	A8	A12
1988/89	14	294	
1989/90	18	423	
1990/91	46	556	
1991/92	52	649	
1992/93	116	911	20
1993/94	135	800	267
1994/95	116	787	277

TABLE II
General classification of WRULD

Hand-arm vibration syndrome
Soft-tissue syndromes
Specific:
Nerve (e.g. carpal tunnel syndrome)
Tendon (e.g. trigger finger)
Fascia (e.g. Dupuytren's)
Non-specific:
Muscle? Non-specific work-related upper limb disorder (synonyms: overuse syndrome, repetitive strain injury, repetitive strain disorder, cumulative trauma disorder)

understandable. Occupational physicians and primary care physicians need sensitive criteria to make an early diagnosis with the hope that early management will stop progression. In contrast, doctors working further up the hierarchical chain do not want to overdiagnose the disorder and use more exacting criteria (such as requiring the presence of physical signs), thus favouring specificity over sensitivity.

Where do we go from here to resolve this position? Clearly, the pain in the arm associated with work does occur and, if untreated, may progress to such an extent that work incapacity results. Whatever the reasons for

TABLE III
Features of WRULD

Obligatory symptoms: (1) Relevant work history (2) Pain in the arm
Other symptoms which may occur: weakness, burning, paraesthesiae, cramp, tremor, inco-ordination, vasomotor disturbances, swelling
Signs which may be present: muscle tenderness, inco-ordination, loss of grip/pinch

this, further study of the phenomenon is required so that better data on epidemiology, aetiology, dose/response relationships, pathophysiology and management can be obtained. As a starting point, we need agreed diagnostic criteria, even if these are only based on symptoms. The Health and Safety Executive could have a major part to play in this and intends to convene an expert panel with a view to obtaining agreed diagnostic criteria for the UK. In addition, the Ergonomics Society is organizing a 1 day seminar to promote a dialogue between ergonomists and occupational physicians. Urgent action is required if we are to prevent the Australian-like epidemic predicted by Reilly [13].

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REFERENCES

1. *Health and safety statistics*. London: HMSO, 1996.
2. Diwaker HN, Stothard J. What do doctors mean by tenosynovitis and repetitive strain injury? *Occup Med* 1995;45:97-104.
3. Brahams D. Repetitive strain injury. *Lancet* 1993;342:1168.
4. Kuorinka I, Jonsson B, Kilbom A *et al*. Standardised Nordic questionnaire for the analysis of musculo-skeletal symptoms. *Appl Ergonomics* 1987;18:233-7.
5. Ferguson D. The 'new' industrial epidemic. *Med J Aust* 1984;140:318-9.
6. Bird HA, Hill J. Repetitive strain disorder: towards diagnostic criteria. *Ann Rheum Dis* 1992;51:924-77.
7. Cooke ED, Steinberg MD, Pearson RM, Fleming CE, Toms SL, Elusade JA. Reflex sympathetic dystrophy and repetitive strain injury: temperature and microcirculatory changes following mild cold stress. *J R Soc Med* 1993;86:690-3.
8. Hagberg M, Michaelson G, Ortelius A. Serum creatine kinase as an indicator of local muscular strain in experimental and occupational work. *Int Arch Occup Environ Health* 1982;50:377-86.
9. Dennett X, Fry HJH. Over-use syndrome: a muscle biopsy study. *Lancet* 1988;1:905-8.
10. Helliwell PS. Occupational rheumatology—are we using the wrong model? *Br J Rheumatol* 1992;31:73-4.
11. Nelson MA, Allen P, Clamp SE, De Dombal FT. Reliability and reproducibility of clinical findings in low back pain. *Spine* 1979;4:97-101.
12. Heberden E. *William Heberden: Physician of the age of reason*. London: Royal Society of Medicine, 1989.
13. Reilly PA. Fibromyalgia in the workplace: a 'management' problem. *Ann Rheum Dis* 1993;52:249-51.