

FEATURE ARTICLE

The Australian RSI epidemic 30 years on

Nick Merdith

Nick Merdith, PhD, ChOHSP, is an Adjunct Research Fellow at Curtin University and safety consultant in the oil and gas drilling industry. Starting out as a physiotherapist, managing workplace injuries lead him into OSH, which saw him complete a MHLthSc(OSH) and subsequent PhD. In 2001, Nick moved into the upstream oil and gas industry, working first in human factors engineering on several major capital projects before going into more general safety supervisory and management roles, mainly in the offshore sector. Interest in this area resulted in Nick completing a MOil&GasEng. He recently spent a few years teaching at Curtin University before returning to industry.

Address for Correspondence: Nick Merdith, Adjunct Research Fellow, School of Public Health, Curtin University, GPO Box U1987, Perth, Western Australia, 6845.

Email: Nick.merdith@curtin.edu.au

LinkedIn: www.linkedin.com/in/nick-merdith-9a991370

Conflict of interest

The author of this paper declares no conflict of interest.

Abstract

Many of today's occupational health and safety professionals may not be aware of the unprecedented industrial epidemic that struck Australia in the mid-1980s, and those who were involved may prefer to forget it. Work-related claims for what became known as repetitive strain injuries (RSI) climbed dramatically through the first half of the decade only to decline in the second half. This review revisits the epidemic and its lessons. Although initially blamed on new technology, in particular computer workstations, the epidemic was the result of the complex and interwoven sociotechnological system of health care practice, the compensation and legal system, industrial relations, the media and the social and political environment at the time. There are important lessons we can take from this epidemic that apply to public health practice today, particularly the nocebo effect of negative communications on the beliefs and expectations that can develop within the sociotechnological system.

Keywords: repetitive strain injury, musculoskeletal disorders, lessons, sociotechnological system, negative communications, nocebo.

Introduction

Many of today's health professionals may not be aware of the unprecedented industrial epidemic that struck Australia in the mid-1980s, and those who were involved may prefer to forget it. Work-related claims for what became known as repetitive strain injuries (RSI) climbed dramatically through the first half of the decade only to decline in the second half. The epidemic was described in 1988 by the Royal Australasian College of Physicians as "the most significant public health issues in the history of Australia" (1(p417)). There are important lessons we can take from this so-called "epidemic" that still apply to public health practice today.

History

Upper limb symptoms associated with repetitive activity have been identified clinically for many years (2, 3). In the Australian workplace, early descriptions appear in Perrot (1961) and Peres (both cited by National Occupational Health and Safety Commission (4)). Ferguson described symptoms of telegraphists' cramp (5) and repetition injuries among process workers (6). Through the late 1970s growing interest in tenosynovitis in the workplace was driven largely by the union movement (7) and raised to public awareness by union-supported workers' health centres (4, 8) and women's support groups (8). In 1979 *Tenosynovitis: A crippling new epidemic in industry* (9) was published in the newsletter "New Doctor". Although it made unsupported claims about the causes, such as drying and frictional heating of synovium, it became central to much of the early discussions related to RSI. The paper was based on a survey of 45 "victims" attending the Workers Health Centre in the inner-west of Sydney, and promoted prolonged rest as the primary treatment. Pillemer (10) raised concerns when he questioned why a growing number of claims had no objective physical signs and failed to respond to treatment. It was later suggested that as few as 5–10% of the claims in the ensuing epidemic involved specific, clinically recognised and diagnosable conditions such as tendonitis, tenosynovitis, carpal tunnel syndrome or epicondylitis (11, 12). The remainder involved non-specific, vague and diffuse symptoms with no clear objective signs or accepted pathophysiological or biomechanical explanation (3). The acronym RSI was coined by the non-medical editor of the Australian Council of Trade Unions' Health and Safety Bulletin (7(p83)) and it was quickly adopted by health professionals, the media and the public, becoming a household term (7, 8).

The first "authoritative" guide to the rising problem was released by the National Health and Medical Research Council. The *Occupational Health Guide — Repetition Strain Injuries* (13) included some unsupported data and claimed that muscles could be overloaded and thus suffer a "repetition" strain injury during activities of daily living such as opening a jar and gardening, as well as work-related tasks. In fact, early definitions were so broad that any activity involving the upper limb was seen as a potential cause so that "the population at risk was virtually universal" (14(p227)). At the height of the epidemic RSI was defined as "a soft tissue disorder caused by overloading of particular muscle groups from repeated use or maintenance of constrained postures. It occurs among workers performing task involving either frequent repetitive movements of the limbs or the maintenance of fixed postures for prolonged periods, for example process workers, keyboard operators and machinists" (4(p51)). In

1986, the National Occupational Health and Safety Commission updated its definition to include the possibility of psychosocial as well as biomechanical factors for the first time (15).

Epidemiology

In Australia, the epidemic started in the late 1970s (1, 3, 16). Although it initially had a broad impact across sectors, it became most prevalent among clerical and administrative workers, especially those using keyboards, and Commonwealth public sector employees were particularly affected (3, 7). RSI also became the centre of at least two industrial disputes (17, 18). Both the United States of America and the United Kingdom experienced similar, although smaller, spikes in RSI like claims in the early 1990s, after the Australian epidemic had subsided (7, 19–22).

In New South Wales, workers' compensation claims for synovitis, bursitis and tenosynovitis roughly trebled between 1978–79 and 1981–82. Claims in the manufacturing sector then demonstrated a sharp decline while claims from the professional sector, which included clerical and administrative workers, continued to climb (23). From 1978–79 to 1982–83, there was an eight-fold increase in claims among female workers in the professional sector (23). This general increase continued in New South Wales through to 1985 (1). In South Australia, there was a 17-fold increase in RSI claims among female clerical workers from 1980–81 to 1984–85. This peak was followed by a sharp decline, with claims decreasing by 58% over the next two years (24). Interestingly, over the period 1980 to 1987, there was little change in the number of claims classified as carpal tunnel syndrome in South Australia. A union survey of 122 data process operators at the Melbourne Taxation Office in 1981 found that 78% were either diagnosed with RSI or reported RSI symptoms (18). Among Western Australian public servants, 22% of data processors, 19% of word processing operators, almost 18% of secretary/stenographers and 12% of typists were recorded as suffering RSI (25).

The Commonwealth Bank (government owned at the time) saw RSI claims climb from six per year in 1980 to 186 in 1984. Keyboard work accounted for 73% of the claims (26). Telecom Australia (the predecessor to Telstra and government owned at the time) was particularly hard hit by the epidemic. Hocking (27), who through his work with the organisation had access to one of the largest and most reliable data sets available, found that lost-time claims attributed to RSI increased almost 13 times from 1981 to 1985 (see Figure 1). Among telephonists the lost-time rate per 1,000 persons increased from 4 to 125 over the same period. There was a statistically significant difference between the states, with Western Australia recording 504 cases per 1,000 telephonists over the 1981–85 period while New South Wales recorded a rate of 182, although Hocking points out this could be due to differences in claims management. Claims started to decrease through 1985. Remarkably, and contrary to the understanding of the condition at the time, when Hocking compared the rate between telephonists (the most affected), clerical workers and telegraphists (the least affected group) there was an inverse relationship between the number of keystrokes and the claims rate (27).

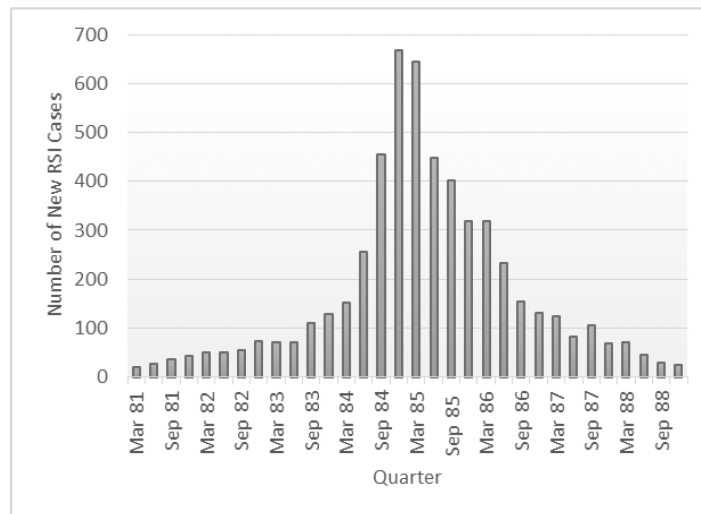


Figure 1: Number of RSI cases in Telecom Australia. Adapted from Hocking B. Repetition strain injury in Telecom Australia. *Med J Aust* 1989; 150(12):724. © Copyright 1898 *The Medical Journal of Australia* — reproduced with permission.

The marked difference from state-to-state for essentially the same work process were also noted in other areas of the public service. At Australia Post in Victoria over the period 1978 to 1983, annual claims went from 4 to 118 for a total of 277 while over the same period in New South Wales the total claims were 109, in Queensland 34 and Western Australia 4. For the Department of Finance 30.8% of the workforce were reporting RSI in South Australia, 11.4% in New South Wales and 10.7% in Victoria (26). In the Health Department RSI was reported by 22.7% of the workforce in South Australia, 13.1% in Victoria and less than 10% in the remaining states (26).

In general, the incidence rate was much higher among female workers (7, 28–33). Gun (24) reported the incidence rate ratio of female to male cases as 4.6 among tradespersons, process workers, labourers and workers involved in transport and communication, and 4.2 among clerical workers. In New South Wales in 1981–82 RSI claims accounted for 55% of new claims among female workers but only 6% among males (23).

A Complex Problem

In some organisations, the rapid spread of RSI resembled a “contagion” (29), the author experiencing this first hand when an experienced keyboard operator was brought in to relieve a worker with RSI, only to be off work themselves in less than five days with a claim. The epidemic spared some organisations or even departments within an affected organisation (29, 34, 35), affected users of new technology as well as established technology such as process lines and traditional typewriters (2, 32, 36), and was not being experienced to same extent in countries of similar development (11, 19). These facts led to some interesting theories for the spread of the epidemic including fluoridated water (37, 38), a virus (39) and the dumping of faulty keyboards on Australia by foreign companies (15, 40).

During the epidemic there was a great deal of negative media attention, both print and television news and current affairs (7, 8, 22, 28, 30, 31, 41). Figure 2 shows the number of newspaper articles covering RSI published across eight titles in the ACT, with the pattern following the timing of the general epidemic. The Royal Australian College of Physicians stated that the misuse of information by the media, unions and support groups, although well meaning, only served to exacerbate the problem (42).

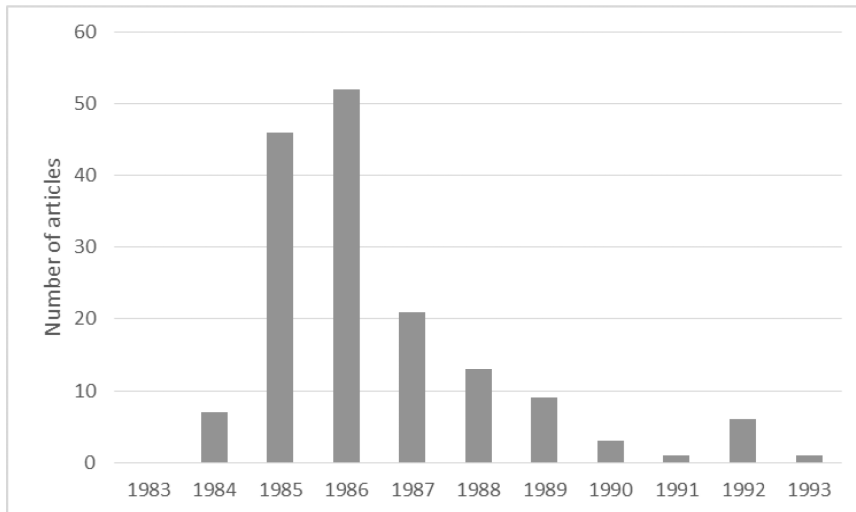


Figure 2: Number of newspaper articles relating to the term “RSI” published in the ACT (eight titles). Data sourced from <http://trove.nla.gov.au/newspaper/>.

There was much debate about the causes of RSI and its epidemic like growth, often very polarising (8, 43) and occasionally vindictive (7). RSI was identified as a specific injury resulting from biomechanical/ergonomic problems (36, 44–49), a non-specific pain syndrome resulting from complex psychosocial issues (10, 36, 40, 50–58) or a spectrum of complaints across this range (59, 60). The Australian experience has been described as “the benchmark of psycho-social epidemics” (19(p67)). It is important to note that suggesting psychosocial causes does not imply that the symptoms were no less real (7, 32, 61), merely that non-biomechanical factors were at play. The term RSI itself was identified as a cause, “injury” implying physical damage and thus identifying the individual as a patient, and “repetitive strain” implying an ergonomic issue in the workplace (2). As Lucire stated, because of the umbrella like definition, “there was no condition that was not RSI and there was no pain that did not have a work-related . . . precursor activity” (7(p86)). In effect the label was both the cause and the diagnosis (62).

The 1988 the Royal Australasian College of Physicians suggested that RSI was “particularly influenced by an incorrect community belief in relation to the effects of work on their bodies. The rapid and dramatic spread of the epidemic related to this

propagation of an abnormal belief' (42(p7)). The Australasian Faculty of Occupational Medicine released an *RSI Consensus Statement* in 1995(3) which identified the causes of the epidemic as:

- the introduction of new technology which exacerbated existing job dissatisfaction
- a diagnosis of RSI and resultant time off work and compensation provided an escape from boring jobs or job anxiety
- confusion among the medical profession regarding diagnosis, pathogenesis, treatment and prognosis which then reinforced their patient's belief in their disability
- the negative attitude of some medical practitioners to their patient's condition may also have reinforced their patients' view of their disability
- sensational and irresponsible media coverage
- the increased focus of unions on health and safety issues and their members' entitlements to compensation for work-related injuries
- poor management not dealing with worker issues; the widely held mechanistic view, which was reinforced by government authorities, that RSI was an injury that resulted from repetitive movements such keyboard use; and
- RSI support groups that strengthened the beliefs in the condition.

To this list could be added an ill-prepared and over-whelmed compensation system, vested interest among various groups in the system (32, 63) and some opportunists seeking easily available compensation payouts. That being said, we must believe that the majority of players in the complex sociotechnological system had the best intentions, even if ill-conceived.

There were many reasons given for the end of the epidemic but Awerbuch possibly best sums it up: "It burnt out because in the end doctors stopped certifying as physically injured large numbers of uninjured workers" (1(p418)).

The lessons

Today RSI and occupational overuse syndrome are used interchangeably in the Australian work injury classification system (64) although many health professionals are not surprisingly reluctant to the use of the former term. Despite the problems with the term, RSI remains in common use worldwide and the widely-consulted Wikipedia categorises cumulative trauma disorder and occupational overuse syndrome under the repetitive strain injury banner (see https://en.wikipedia.org/wiki/Repetitive_strain_injury). RSI is no longer treated as a distinct condition, with the signs and symptoms now falling within musculoskeletal disorders. "The term 'disorder' gives an indication of the multifactorial nature of these conditions, which often develop from exposure to more than one risk factor and do not always fit neatly into an 'injury' or 'disease' category. This group includes labels (and colloquial terms) such as 'repetitive strain injuries', 'occupational overuse syndrome', . . ." (65(p9)). In Australia RSI/occupational overuse syndrome now accounts for about 0.8% of all workers' compensation claims involving one or more weeks lost times (66).

The RSI epidemic has been described as a social process (41, 51, 67, 68) or, more precisely, an example of social iatrogenesis (7, 34, 40, 53). Looking back on the epidemic it would be naive to think there was no malingering involved but there is no way to measure the extent of this. The majority of the remaining individuals were believed to be experiencing either a specific and easily managed conditions such as tenosynovitis or epicondylitis or, more often, simple and relatively normal every-day discomfort. These conditions then developed into a medicalised injury and secondary disability under the complex and interwoven sociotechnological system of health care practice, the compensation and legal system, industrial relations, the media and social environment at the time. Ireland (32) suggested that “Although arm pain is a common accompaniment to the activities of daily living, potential R.S.I. sufferers, lacking fulfilment in their work, have been unable to accept this when faced with the notion that repetitious tasks (in which they are employed) cause injury. The powers of suggestion reinforcing this notion by sections of the press, trade unions, legal and medical professions and others, have been overwhelming”(p7). In early union published guidance, it was suggested that “Unions with members suffering from RSI should ensure that they receive swift and full financial compensation. Legal assistance should be sought with respect to claims for damages at Common Law” (69(p2)), all but creating a permanent disability. We now know an individual’s beliefs and expectations can significantly affect their musculoskeletal health outcomes (See for example: (70, 71–76)). Similarly, community views, legislation, health policy, compensation and political agenda have been suggested to play a role in low-back pain (77). This complex sociotechnological system no doubt has feedback loops which help sustain the negative beliefs and expectations within the system.

In the context of this sociotechnological iatrogenesis, the RSI epidemic can be seen as a nocebo effect on a national scale, where negative communication creates negative beliefs and expectations in the individual, which results in an adverse outcome (78, 79). The nocebo effect can result in altered neurological activity, biochemical changes and reduced motor performance (80), which could explain many of the symptoms associated with RSI. The nocebo effect also means that workplace interventions may, at times, increase the risk of injury or illness; by targeting hazards in the workplace we raise workers’ awareness and potentially focus their attention on the “hazardous” nature of their work, creating or reinforcing existing negative beliefs and attitudes. An even broader and deeper effect would result from labelling a whole industry as hazardous. A better approach, at least for musculoskeletal disorders, may be educating people that the physical activities of work are, on the whole, good for us (81, 82) and that odd aches and pains are a normal part of living. Understanding nocebo effects and limiting their influence has been flagged as an important consideration for models of care in the compensation arena (83). After all, one of the reasons we walk upright is to allow us to use tools and lift and carry things.

Today, we have a better understanding and acceptance of the significant role psychosocial factors have in the development of work-related musculoskeletal disorders (72, 84–92). However, considering “Dr Google”, social media and a move towards a more empathetic society, the questions remains whether our current systems would have dealt any better with the epidemic and to what extent are similar complex and interrelated forces working on conditions such as work-related stress

claims, chronic fatigue syndrome, post-traumatic stress disorder and electromagnetic hypersensitivity.

REFERENCES

1. Awerbuch, M. Repetitive strain injuries: Has the Australian epidemic burnt out? *Internal Medicine Journal*. 2004; (34):416–419; doi:10.1111/j.1444-0903.2004.00640.x.
2. Hadler, NM. Industrial rheumatology. The Australian and New Zealand experiences with arm pain and backache in the workplace. *Medical Journal of Australia*. 1986; 144(4):191–5. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/2935719>.
3. Australasian Faculty of Occupational Medicine. RSI Consensus Statement. 1995.
4. National Occupational Health and Safety Commission. *Interim Report of the RSI Ad Hoc Committee*. Canberra: Australian Government Publishing Service, 1985.
5. Ferguson, D. An Australian study of telegraphists' cramp. *British Journal of Industrial Medicine*. 1971; 28(3):280–85; doi:10.1136/oem.28.3.280.
6. Ferguson, D. Repetition injuries in process workers. *Medical Journal of Australia*. 1971; 2(8):408–12.
7. Lucire, Y. *Constructing RSI: Belief and Desire*. Sydney: University of New South Wales, 2003.
8. Bammer, G and Martin, B. Repetition strain injury in Australia: Medical knowledge, social movement, and de facto partisanship. *Social Problems*. 1992; 39(3):219–37. doi:10.2307/3096959.
9. Walker, J. Tenosynovitis. A crippling new epidemic in industry. *New Doctor Journal of the Doctors' Reform Society*. 1979; 13:19–21.
10. Pillemer, R. Tenosynovitis. *AMA Gazette*. 1979; 227:4.
11. Kiesler, S and Finholt, T. The mystery of RSI. *American Psychologist*. 1988; 43(12):1004–15. doi:10.1037/0003-066X.43.12.1004.].
12. Miller, MH and Topliss, DJ. Chronic upper limb pain syndrome (repetitive strain injury) in the Australian workforce: A systematic cross sectional rheumatological study of 229 patients. *The Journal of Rheumatology*. 1988; 15(11):1705–1712. Available from: <http://europepmc.org/abstract/MED/2976831>.
13. National Health and Medical Research Council. *Approved Occupational Health Guide — Repetition Strain Injuries*. Commonwealth Dept. of Health; 1982.
14. Cleland, LG. Medico-legal Iatrogenesis: A Kafkaesque Analysis. *Adel. L. Rev*. 1989; 12:225.
15. National Occupational Health and Safety Commission. *Repetition Strain Injury: A Report and Model Code of Practice*. Canberra: Australian Government Publishing Service, 1986.

16. Ferguson, D. The “new” industrial epidemic. *Medical Journal of Australia*. 1984; 140(6):318–9. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/6700485>.
17. Creighton, W and Micallef, E. Occupational health and safety as an industrial relations issue: The Rank-General Electric Dispute 1981. *Journal of Industrial Relations*. 1983; 25(3):255–68.
18. Taylor, R and Pitcher, M. Medical and ergonomic aspects of an industrial dispute concerning occupational-related conditions in data process operators. *Community Health Studies*. 1984; 8(2):172–180; doi:10.1111/j.1753-6405.1984.tb00441.x.
19. Malleon, A. *Whiplash and Other Useful Illnesses*. Montreal: McGill-Queen’s University Press, 2002.
20. Brooks, P. Repetitive strain disorder: Does not exist as a separate medical condition. *British Medical Journal*. 1993; 307:1298; doi:10.1136/bmj.307.6915.1298.
21. Zakaria, D, Robertson, J, MacDermid, J, Hartford, K and Koval, J. Work-related cumulative trauma disorders of the upper extremity: Navigating the epidemiologic literature. *Am. J. Ind. Med.* 2002; 42(3):258–69. doi:10.1002/ajim.10100.
22. Reilly, PA. ‘Repetitive strain injury’: From Australia to the UK. *Journal of Psychosomatic Research*. 1995; 39(6):783–8. doi:10.1016/0022-3999(95)00030-M.
23. Ross, IJK. Trends in repetition strain injury statistics in New South Wales. *Journal of Occupational Health and Safety — Australia and New Zealand*. 1985; 1(2):96–101.
24. Gun, RT. The incidence and distribution of RSI in South Australia 1980–81 to 1986–87. *Medical Journal of Australia*. 1990; 153(7):376–80.
25. Repetitive Strain Injury Task Force. *Report to the Public Service Board of Western Australia*; 1985.
26. Task Force on Repetition Strain Injury in the APS. *Repetition Strain Injury in the Australian Public Service*. Canberra, 1985.
27. Hocking, B. Epidemiological aspects of “repetition strain injury” in Telecom Australia. *Medical Journal of Australia* 1987; 147(5):218–22. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/3670169>.
28. Littlejohn, GO. Fibrositis/fibromyalgia syndrome in the workplace. *Rheumatic Diseases Clinics of North America*. 1989; 15(1):45–60. Available from: <http://europepmc.org/abstract/MED/2644678>.
29. Deves, L and Spillane, R. Occupational health, stress, and work organization in Australia. *International Journal of Health Services*. 1989; 19(2):351–363. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/2654040>.
30. Ewan, C, Lowy, E and Reid, J. ‘Falling out of culture’: The effects of repetition strain injury on sufferers’ roles and identity. *Sociology of Health & Illness*. 1991; 13(2):168–192; doi:10.1111/1467-9566.ep11340787.

31. Meekoshe, H and Jakubowicz, A. Repetition strain injury: The rise and fall of an 'Australian' disease. *Critical Social Policy*. 1991; 11(31):18–37; doi:10.1177/026101839101103102.
32. Ireland, DCR. Psychological and physical aspects of occupational arm pain. *The Journal of Hand Surgery: British & European Volume*. 1988; 13(1):5–10. doi:http://dx.doi.org/10.1016/0266-7681(88)90041-1.
33. Champion, DG, Cornell, J and Browne, CD. Clinical observations in patients with the clinical syndrome "repetitive strain injury". *Journal of Occupational Health and Safety*. 1986; 2:107–113.
34. Lucire, Y. Social iatrogenesis of the Australian disease 'RSI'. *Community Health Studies*. 1988; 12(2):146–50. Available from:
35. Bell, DS. Repetitive strain injury. *Medical Journal of Australia*. 1986; 145:117–118.
36. McDermott, FT. Repetition strain injury: A review of current understanding. *Medical Journal of Australia*. 1986; 144:196–200.
37. Smith, GE. Repetitive strain injury, or incipient skeletal fluorosis? *N Z Med J*. 1985; 98(785):710. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/3863039>.
38. Smith, GE. Repetitive strain injury (RSI) and magnesium and fluoride intake. *N Z Med J*. 1985; 98(782):556–7. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/3861970>.
39. Forsyth, JRL. "Repetition strain injury": An iatrogenic epidemic. *Medical Journal of Australia*. 1989; 151(10):598.;
40. Bell, DS. Repetition strain injury — An iatrogenic epidemic of simulated injury. *Medical Journal of Australia*. 1989; 151(5):280.
41. Reid, J and Reynolds, L. Requiem for RSI: The explanation and control of an occupational epidemic. *Medical Anthropology Quarterly*. 1990; 4(2):162–190. Available from: <http://www.jstor.org/stable/648972>.
42. Royal Australasian College of Physicians. Repetitive strain injury/occupational overuse syndrome. *Fellowship Affairs*. 1988.
43. Bammer, G and Martin, B. The arguments about RSI: An examination. *Community Health Studies*. 1988; 12(3):348–358; doi:doi/10.1111/j.1753-6405.1988.tb00596.x.
44. Browne, CD, Nolan, BM and Faithfull, DK. Occupational repetition strain injuries: Guidelines for diagnosis and management. *Medical Journal of Australia*. 1984; 140(6):329–332.
45. Taylor, R, Gow, C and Gorbett, S. Repetition injury in process workers. *Australian and New Zealand Journal of Public Health*. 1982; 6(1):7–13.
46. Yassi, A. Repetitive strain injuries. *Lancet*. 1997; 349(9056):943–7. doi:10.1016/S0140-6736(96)07221-2.
47. Chatterjee, DS. Repetition strain injury — A recent review. *Occupational Medicine*. 1987; 37(1):100–105; doi:10.1093/occmed/37.1.100.

48. Quintner, J and Elvey, R. The neurogenic hypothesis of RSI. In: *Discussion papers on the pathology of work-related neck and upper limb disorders and the implications for diagnosis and treatment*. National Centre for Epidemiology and Population Health working paper no. 24: National Centre for Epidemiology and Population Health, The Australian National University Canberra, Australia; 1991. pp 1–25.
49. Quintner, JL. The pain of 'RSI'. A historical perspective. *Australian Family Physician*. 1989; 18(8):1003–6, 1008–9.
50. Carette, S. Chronic pain syndromes. *Annals of the Rheumatic Diseases*. 1996; 55(8):497; doi:10.1136/ard.55.8.497.
51. Spillane, R. Medicalising work behaviour: The case of repetition strain injury. *Asia Pacific Journal of Human Resources*. 2008; 46(1):85–98; doi:10.1177/1038411107086545.
52. Ferguson, D. "RSI": Putting the epidemic to rest. *Medical Journal of Australia*. 1987; 147(5):213–4.
53. Cleland, LG. "RSI": A model of social iatrogenesis. *Medical Journal of Australia*. 1987; 147(5):236, 238–9. [cited Sep 07];
54. Hall, W and Morrow, L. 'Repetition strain injury': An Australian epidemic of upper limb pain. *Social Science and Medicine*. 1988; 27(1988):645–649; doi:10.1016/0277-9536(88)90013-5.
55. Ireland, DCR. Australian repetition strain injury phenomenon. *Clinical Orthopaedics and Related Research*. 1998; 351:63–73. Available from: http://journals.lww.com/corr/Fulltext/1998/06000/Australian_Repetition_Strain_Injury_Phenomenon_9.aspx.
56. Melhorn, JM. Cumulative trauma disorders and repetitive strain injuries. The future. *Clinical Orthopaedics and Related Research*. 1998; 351:107–126. Available from: http://journals.lww.com/corr/Fulltext/1998/06000/Cumulative_Trauma_Disorders_and_Repetitive_Strain.15.aspx.
57. Szabo, RM and King, KJ. Repetitive stress injury: diagnosis or self-fulfilling prophecy? *J Bone Joint Surg Am*. 2000; 82(9):1314–22. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/11005523>.
58. Wright, GD. The failure of the "RSI" concept. *The Medical Journal of Australia*. 1987; 147(5):233.
59. Grigor, J. RSI. *Medical Journal of Australia*. 1986; 145(2):116–117.
60. Helliwell, PS and Taylor, WJ. Repetitive strain injury. *Postgraduate Medical Journal*. 2004; 80(946):438–443; doi:10.1136/pgmj.2003.012591.
61. Gun, RT and Jezukaitis, PT. RSI: A perspective from its birthplace. *Occup Med*. 1999; 14(1):81–95, iv.
62. Lucire, Y. Neurosis in the workplace. *Medical Journal of Australia*. 1986; 145:323–327.
63. Brooks, PM. Repetition strain injury. *Lancet*. 1987; 2(8561):738–738. [cited Sep 26]; doi:10.1016/S0140-6736(87)91093-2.

64. Australian Safety and Compensation Council. *Type of Occurrence Classification System*, 3rd edn, Revision 1 2008.
65. Safe Work Australia. *Work-Related Musculoskeletal Disorders in Australia* 2006.
66. Safe Work Australia. *Statistics on Work-Related Musculoskeletal Disorders* 2016.
67. Willis, E. RSI as a social process. *Community Health Studies*. 1986; 10(2):210. Available from: <http://onlinelibrary.wiley.com/store/10.1111/j.1753-6405.1986.tb00102.x/asset/j.1753-6405.1986.tb00102.x.pdf?v=1&t=j2zm00ge&s=5192e19b80093aacd16cee8eb1321f4f11810903>.
68. Spillane, R and Deves, L. RSI: Pain, pretence or patienthood? *Journal of Industrial Relations*. 1987; 29(1):41–48.
69. ACTU-VTHC occupational health and safety unit. ACTU health & safety policy: prevention of repetitive strain injury. *Health and Safety Bulletin*. 1983; 29:1–4.
70. Coggon, D. Occupational medicine at a turning point. *Occup Environ Med*. 2005; 62(5):281–3. [cited May]; doi:10.1136/oem.2004.017335.
71. Beales, D, Smith, A, O'Sullivan, P, Hunter, M and Straker, L. Back pain beliefs are related to the impact of low back pain in baby boomers in the Busselton Healthy Aging Study. *Phys Ther*. 2015; 95(2):180–9. doi:10.2522/ptj.20140064.
72. Coggon, D, Ntani, G and Palmer, KT et al. Disabling musculoskeletal pain in working populations: is it the job, the person, or the culture? *Pain*. 2013; 154(6):856–63. doi:10.1016/j.pain.2013.02.008.
73. Buchbinder, R, van Tulder, M and Öberg, B et al. Low back pain: a call for action. *The Lancet*. 2018; doi:10.1016/s0140-6736(18)30488–4.
74. Balague, F, Mannion, AF, Pellise, F and Cedraschi, C. Non-specific low back pain. *Lancet*. 2012; 379(9814):482–91. doi:10.1016/S0140-6736(11)60610-7.
75. Solidaki, E, Chatzi, L and Bitsios, P et al. Work related and psychological determinants of multi-site musculoskeletal pain. *Scandinavian Journal of Work, Environment & Health*. 2010; 36(1):54.
76. Petrie, KJ and Weinman, J. Why illness perceptions matter. *Clin Med (Lond)*. 2006; 6(6):536–9. doi:10.7861/clinmedicine.6-6-536.
77. Main, CJ, Foster, N and Buchbinder, R. How important are back pain beliefs and expectations for satisfactory recovery from back pain? *Best Pract Res Clin Rheumatol*. 2010; 24(2):205–17. doi:10.1016/j.berh.2009.12.012.
78. Colloca, L and Finniss, D. Nocebo effects, patient-clinician communication, and therapeutic outcomes. *JAMA*. 2012; 307(6):567–568. doi:10.1001/jama.2012.115.
79. Hahn, RA. The nocebo phenomenon: concept, evidence, and implications for public health. *Prev Med*. 1997; 26(5 Pt 1):607–11. doi:10.1006/pmed.1996.0124.
80. Benedetti, F, Lanotte, M, Lopiano, L and Colloca, L. When words are painful: Unraveling the mechanisms of the nocebo effect. *Neuroscience*. 2007; 147(2):260–271. doi:http://dx.doi.org/10.1016/j.neuroscience.2007.02.020.

81. Waddell, G and Burton, KA. *Is Work Good for Your Health and Wellbeing?* London: The Stationery Office; 2006.
82. Waddell, G, Burton, K and Aylward, M. *Work and common health problems. J Insur Med.* 2007; 39(2):109–20. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/17941336>.
83. Beales, D, Fried, K and Nicholas, M et al. Management of musculoskeletal pain in a compensable environment: Implementation of helpful and unhelpful models of care in supporting recovery and return to work. *Best Pract Res Clin Rheumatol.* 2016; 30(3):445–467. doi:10.1016/j.berh.2016.08.011.
84. Vargas-Prada, S and Coggon, D. Psychological and psychosocial determinants of musculoskeletal pain and associated disability. *Best Pract Res Clin Rheumatol.* 2015; 29(3):374–90. doi:10.1016/j.berh.2015.03.003.
85. Bongers, PM, Kremer, AM and ter Laak, J. Are psychosocial factors, risk factors for symptoms and signs of the shoulder, elbow, or hand/wrist?: A review of the epidemiological literature. *American Journal of Industrial Medicine.* 2002; 41(5):315–342; doi:10.1002/ajim.10050.
86. Caruso, G. Biopsychosocial considerations in unnecessary work disability. *Psychological Injury and Law.* 2013; 6(3):164–182; doi:10.1007/s12207-013-9162-y.
87. MacDonald, W and Evans, O. *Research on the Prevention of Workrelated Musculoskeletal Disorders Stage 1 — Literature review.* 2006: Australian Safety and Compensation Council. Available from: https://www.safeworkaustralia.gov.au/system/files/documents/1702/research_prevention_workrelated_musculoskeletal_disorders_stage_1_literature_review.pdf.
88. Ring, D and Ayers, DC. Editorial comment: Symposium: Psychosocial aspects of musculoskeletal illness. *Clinical Orthopaedics and Related Research.* 2015; 473(11):3468–3469. doi:10.1007/s11999-015-4544-y.
89. Gorman, D. What can be learnt from the 1980s Australian and New Zealand work-related musculoskeletal pain epidemics? *Internal Medicine Journal.* 2014; 44(8):717–9; doi:10.1111/imj.12496.
90. Eatough, EM, Way, JD and Chang, C. Understanding the link between psychosocial work stressors and work-related musculoskeletal complaints. *Applied Ergonomics.* 2012; 43(3):554–563. [cited 2012/05/01/]; doi:10.1016/j.apergo.2011.08.009.
91. Lang, J, Ochsmann, E, Kraus, T and Lang, JWB. Psychosocial work stressors as antecedents of musculoskeletal problems: A systematic review and meta-analysis of stability-adjusted longitudinal studies. *Social Science & Medicine.* 2012; 75(7):1163–1174. [cited 2012/10/01/]; doi:10.1016/j.socscimed.2012.04.015.
92. Waddell, G. 1987 Volvo award in clinical sciences. A new clinical model for the treatment of low-back pain. *Spine.* 1987; 12(7):632–44. [cited Sep]; doi:10.1097/00007632-198709000-00002.