

## Prevention of occupational Back Pain

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### ABSTRACT

This paper reviews scientific research on occupational back pain and focuses on prevention of this problem. It discusses some of the challenges of translating the evidence of this multi-factorial condition into policy. Medical science is currently unable to clearly distinguish between back pain caused by work and that possibly due to other causes but which affects the individual's capacity to work. Back pain affects the vast majority of people at some point in their lives and is very costly to both the health care system and the industry. Evidence suggests that heavy lifting, driving, and vibration of the whole body are linked to occupational back pain. Once the risk factors for occupational back pain are identified, an otherwise chronic and disabling condition can be prevented in the majority of patients. As explained in this article, three levels of prevention for occupational back pain have been reported as effective. Failure to implement preventive measures may lead to a high incidence of occupational back pain.

**Key words:** Back pain, occupation, prevention

### INTRODUCTION

Back pain is a complex phenomenon that, despite a range of interventions to reduce its impact, continues to be a major health burden on individuals, employers, and the society. It is estimated that between 60% to 80% of any population will experience back pain at some point in their lives.<sup>[1-8]</sup> Population surveys indicate a high prevalence of back pain as many people do not report their pain, take time off from work, or seek medical treatment.<sup>[9-12]</sup>

Prevalence data on back pain generally rely on musculoskeletal symptoms, surveys, or questionnaires. Therefore, there is a lack of standardized methodology and reporting by researchers in this field. It has been estimated that back pain among health care workers range from 47% to 70%, with a point prevalence of 30%, and these figures differ from one country to the other.<sup>[13-19]</sup> Back pain is very costly to the health care system. Furthermore, with time taken off work, the

direct cost approaches more than 25 billion US dollars while indirect costs vary widely to a total of 100 billion US dollars per year.<sup>[20-23]</sup> It is reported that on average, back pain claims in the USA cost \$6,807 per case.<sup>[24-26]</sup> Back injury rates are highest in industry and occupations involving manual labor such as in construction and manufacturing industries.<sup>[27-30]</sup>

The causes of back pain are multi-factorial and must be investigated during clinical assessment. Failure to undertake a comprehensive approach to a patient with backache can lead to mismanagement and chronicity. It is known that any structure that involves the spine is a potential source of back pain. Consequently, it is considered to be a symptom of a wide range of possible injuries. For example, the spinal nerves can be pinched by a slipped disk. Sudden unfamiliar or unexpected movements are the most frequent cause of muscular back pain. Other causes of back pain include poor posture, excess weight, lack of exercise, and others as explained below. It should be noted that it is extremely difficult to differentiate between nonoccupational and occupational back pain from the clinical point of view.<sup>[31,32]</sup>

This paper reviews scientific research on occupational back pain and focuses on preventing the condition. Physicians can play a major role in reducing the chronicity and recurrence of backache if they implement these preventive measures.

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## RISK FACTORS FOR OCCUPATIONAL BACK PAIN

Studies of physical risk factors at work involve indirect measurement tools through self-reported questionnaires rather than direct measurement of exposure.<sup>[33,34]</sup> There is evidence to suggest that heavy lifting, driving, and vibration of the whole body are linked to occupational back pain.<sup>[35-45]</sup> There is also a significant increase in the risk of a work-related backache from prolonged bending and twisting on the job.<sup>[34-45]</sup> A past history of back pain is believed to be the most important single factor in predicting a future recurrence of back injury.<sup>[35-45]</sup> However, growing evidence links psychosocial risk factors to occupational back pain, particularly monotonous work, perceived high workload, pressure of time, lack of decision-making authority, and job dissatisfaction.<sup>[46-48]</sup> Smoking and obesity have both been linked to nonoccupational back pain in epidemiological studies.<sup>[49-50]</sup>

## PREVENTION OF OCCUPATIONAL BACK PAIN

Prevention can be difficult because the risk factors and causes of back pain injury are poorly understood. However, prevention of occupational back pain can be on three levels, all of which have been reported as effective.

### Primary prevention (before incidence)

Primary prevention of back pain in the workplace is usually the most common strategy utilized by employers. Many cases of back pain could be prevented by changes in the workplace that focus on reducing the incidence of new episodes of occupational back pain.<sup>[51-55]</sup> The aim, in this case, is to increase the resistance to back pain by teaching workers about causes, risk factors, management, and prevention.<sup>[56]</sup>

Teaching of “proper” lifting techniques to material handlers has been proven to be effective in reducing occupational back pain.<sup>[57,58]</sup> Another is to aim at reducing the physical demands of work through the design of the workplace. For instance, mechanical hoists are used in hospitals to reduce the load of patient lifting for nurses. The National Institute of Occupational Safety and Health (NIOSH) developed a lifting equation in 1981 which was then revised in 1991 in an attempt to determine recommended weight limits for workers. Although the NIOSH guidelines are frequently utilized in industry, applying the equation in many jobs is difficult. There is still no universally accepted method of determining safe lifting capacity for workers. Some researchers have recommended a maximum lifting weight of 23 kg if the object is within 18 cm in front of the body.<sup>[59,60]</sup>

Preplacement strength testing as a screening method and physical examination for back disorders are controversial; even radiological screening has added no significant predictive value to screening for future back pain.<sup>[61-70]</sup> Furthermore, abdominal belts have been proven by randomized clinical trials to be ineffective at preventing back pain. No definitive conclusion has been reached on the clinical significance of back schools (an educational program that teaches practical information about back care, posture, body mechanics, back exercises, and how to prevent chronic back).<sup>[71,72]</sup>

Interventions to reduce the physical demands of the workplace have proven effective. However, a number of factors should be taken into account when discussions take place on the effectiveness of such preventive initiatives as a redesign of the workplace (redesigning the workplace can be expensive). A good example is designing workplace in the office “ergonomics” in such a way that tasks fit the capabilities of the workers. These include eyes to the source (monitor), hand to input devices (keyboard and mouse), body to chair and feet to the floor. Without the commitment of the management and the involvement of workers, the impact of the changes in the workplace the aim of which is to prevent back pain will be negative. It is difficult to determine exactly what needs to be changed, and how to measure outcome is uncertain.

There is good scientific evidence that primary preventive interventions against occupational back pain are cost-effective.<sup>[21]</sup> However, more studies of workplace interventions are needed. The role of psychosocial and organizational factors, in particular, need to be better examined.<sup>[22,27]</sup>

### Secondary prevention (of chronicity and recurrence of symptoms)

There is considerable promise for minimization of pain and disability in already symptomatic patients through secondary prevention. After decades of international research, very little is known about who does and who does not get better quickly, and why recovery time varies so greatly for people with back pain. Risk factors identified to date, such as age, and previous back problems are immutable. There is good evidence in medical literature that the majority of patients (80%) in the acute phase (symptoms of back pain last 3–4 weeks) will have good prognosis even with minimal investigation and treatment.<sup>[17,19]</sup> Indeed, research indicates that over-treatment at this phase with excessive rest<sup>[73]</sup> can increase sickness behavior through deconditioning of the body muscles.<sup>[74]</sup>

In the sub-acute phase (4–12 weeks after symptom onset) if the patient is still off work, measures targeted at the

physical demands of the worker's job can be both effective and cost saving. It is well-documented in the literature that the longer these patients are away from work, the harder it is to get them back to work.<sup>[45,74]</sup>

As for patients in the chronic phase (>3 months after symptom onset) there are few, if any, well-controlled trials that demonstrate chronic back pain treatment, but multi-disciplinary approaches appear to be effective. Studies to date indicate the effectiveness of the early provision of modified work in improving outcome. On the other hand, intervention by the health care system through the provision of fairly clear guidelines on the management of back pain has proved to be effective. There are scientifically substantiated, well-documented international guidelines in the medical literature for the management of backache. These guidelines are challenging to implement since their aim is to standardize physicians' clinical practice. It is becoming increasingly clear that optimizing the management of back pain will bring significant improvement in the worker's recovery and reduce time lost off work.<sup>[73-78]</sup> It is important to implement the following guidelines<sup>[73-78]</sup> which are benchmarked against international standards:

- The key points for acute and subacute back pain (<3 months):
  - Discourage bed rest or limit to a maximum of 2 days in severe cases
  - Stay active (exercise)
  - No radiological investigations except when there are red flags (age <20 years or >50 years, significant trauma, spinal infection, and cauda equina syndrome).
- For chronic back pain (>3 months):
  - Refer to physiotherapy (for assessment and exercise)
  - Investigate for psychosocial factors also called yellow flags (use a published questionnaire or refer to psychiatry).

Indeed, exercise (swimming or walking 45 min 3–4 times a week) appears to have a beneficial effect for the prevention of back pain. The greater the intensity of exercise, the greater the benefit to the individual.<sup>[79,80]</sup> Studies have reported that exercise improves the symptoms of back pain, reducing sick leave and making possible an earlier return to work.<sup>[79-82]</sup>

### Tertiary prevention (reducing disability)

Prompt return to work has a clear impact in reducing disability.<sup>[74]</sup> However, this requires flexible modified work for the employee with back pain. This can be difficult for small companies. Disability resulting from back pain is

multidimensional and challenges our familiar paradigms of illness and health and even our social and medical decision-making structures.<sup>[83,84]</sup> We must also acknowledge the limits and legitimate contributions of rehabilitation programs in the management of chronic back pain.<sup>[85,86]</sup> It is worth mentioning that this level of prevention is difficult to achieve unless the patient is motivated to enroll in a rehabilitation program, and the psychosocial factors of occupational back pain are dealt with in a multidisciplinary manner.

## CONCLUSION

Occupational back pain is a multi-factorial condition commonly encountered in outpatient clinics. It is very costly for the healthcare system and industry. It can easily be prevented, and physicians can play a major role in this regard to stop it from becoming chronic and disabling. Physicians must standardize their clinical approach to the patient with occupational back pain by implementing clinical guidelines for this condition. In particular, any patient with acute back pain should not have imaging studies done unless there is evidence of red flags. Bed rest must be discouraged and limited to a maximum of 2 days in severe cases with early return to work on modified jobs where there is no lifting or climbing or bending (avoid risk factors), and a follow-up for further intervention if necessary.

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