



INSTITUTE FOR HEALTH AND PRODUCTIVITY MANAGEMENT

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Global Burden of Chronic Musculoskeletal Pain in the Workplace

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It results in being less productive on the job because of functional impairment, or exit from the workforce entirely because of disability. The great majority of chronic pain is musculoskeletal – especially low back pain (LBP) and osteoarthritis (OA) – although the precise proportion of either is rarely specified in studies.

Prevalence of Chronic Musculoskeletal Pain

The average global prevalence of LBP at any point in time – the “point prevalence” – is reported between 9.4 and 11.9 percent,^{1,2} while 23.2 percent of people worldwide experience such pain during any given month – the “period prevalence.”³

Among workers in the United States, the prevalence of LBP in any two-week period has been reported at 15 percent – with more than 40 percent of them experiencing exacerbations that increase the workplace impact and cost burden to employers – i.e., 50 percent more LBP-related lost productive time.⁴ Strikingly, after an initial episode of LBP, 50 to 75 percent of people suffer at least one relapse.⁵

Chronic LBP increases linearly from age 30 to age 60, reaching peak prevalence between ages 50 and 60.⁶ Based on Institute for Health and Productivity Management’s (IHPM) field work with employers, these are the most experienced, often most dedicated and productive employees in any organization – whom no employer wants to lose after investing many years in their training and development.

In Europe, the incidence of the first episode of LBP has been reported to range from 6.3 to 15.5 percent over a one-year period, with many patients having recurrent episodes. About one-third of workers who have been injured have a recurrence of LBP within a year.⁷

Elsewhere around the globe, estimates of the “point prevalence” of LBP vary widely:

- 6.3 to 11.1 percent in the United Kingdom⁸
- Chronic pain affects 10 to 20 percent of Japanese, with back pain the most prevalent at 72 percent⁹
- 10.5 percent on average for all of Latin America¹⁰

(studies in Brazil alone, reported in *Cadernos de Saude Publica*, ranged from 4.2 to 14.7¹¹ percent “with a high risk of bias”)

- A higher range was reported in a study of people age 50 and up, in “six less fully developed nations” – 22 percent in China, 36 percent in Mexico, 39 percent in India and South Africa, 41 percent in Ghana, and 56 percent in Russia – with three-quarters or more of sufferers in all the countries reporting “*moderate intensity*” of pain.¹²

The prevalence of LBP increased in every region of the world over the years 1990– 2010,² but especially in North America and Western Europe – where increasingly sedentary lifestyles have led to rising levels of obesity. Not surprisingly, Disability-Adjusted Life Years (DALYs) related to chronic musculoskeletal pain jumped from 58 to 83 million over the same 20 year period.²

Impact of Chronic Musculoskeletal Pain on Countries

In Europe, the presence of **moderate-to-severe** daily pain reduced the probability of working full-time by 10 to 20 percentage points – much greater than the impact of any other health status measure on labor force participation.¹³ The impact of pain on absenteeism and presenteeism also exceeds that of other health measures.¹³ In the United States, OA and LBP together have been found by the Centers for Disease Control (CDC) to account for one third of all work disability, in nearly equal shares of 17.5 percent and 16.5 percent, respectively.¹⁴

Musculoskeletal Pain in general accounts for 21.3 percent of total **Years Lost to Disability (YLD)** globally, second only to Mental and Behavioral Health conditions at 23.2 percent.¹⁵

“Low back pain by itself has become the single leading reason for YLD in every region of the world ...

... after significant increases in prevalence in most regions over the two decades from 1990 to 2010.”¹⁵

Economic Costs Associated with Chronic Pain

Reliable estimates of the overall economic costs of chronic pain in studies published to date are mostly available for the U.S. and the EU, and these vary considerably. The *Institute of Medicine*¹⁶ puts the total annual cost of chronic pain in medical care and lost productivity for all Americans at between \$560 and \$635 billion, with lost productivity accounting for \$297 to \$336 billion (2011). The cost of lost wages for employees was \$226 billion, while the actual cost to employers in lost work time from absenteeism (*not at work*) and ‘presenteeism’ (*functional impairment while at work*) was \$109 billion.

A study in *Journal of the American Medical Association*,¹⁷ that focused on LBP alone, estimated the cost for 26 million working-age Americans (20 – 64 years of age) to be \$86 billion. Another study in the *American Journal of Public Health*¹⁸ noted that LBP is the leading cause of workers’ compensation claims, adding additional employer costs. A third study in the *Journal of Occupational and Environmental Medicine*¹⁹ showed that arthritis and associated joint disorders resulted in higher health care, absence, prescription drug, disability and workers compensation costs totaling \$1,800 per employee – as well as a 4 percent reduction in productivity, equaling a 4 times greater revenue loss of \$7,454 per employee.

An associated cost of the rising prevalence of chronic pain – somewhat unique to the United States – is the widely reported “epidemic” of overuse and abuse of opioid painkillers. This often starts appropriately enough with a prescription intended for relatively short-term use, that can extend to longer-term inappropriate use of Rx drugs, and finally can cross the line into use of illegal synthetic drugs. Improved management of chronic pain – with appropriate use of opioids – would reduce the alarming human cost of abuse seen in daily headlines about deaths from overdose of these drugs, now estimated by the Centers for Disease Control (CDC) at more than 50,000 annually in the U.S. alone.²⁰ This issue has now received the attention of the nation’s political leaders.

In Europe, the estimated direct health care and indirect productivity loss costs of chronic pain disorders in EU member states has been estimated as high as €441 billion,²¹ or between 3 and 10 percent of GDP across the EU.²²

A few notable data points from other research conducted in the EU region:

- Musculoskeletal pain generally accounted for nearly half of all absences of three days or more,

and 60 percent of reported work incapacity.²¹

- Direct health care costs for LBP were €7,000 per affected patient in Germany, but 75 percent of total costs resulted from work absenteeism.⁸
- Indirect costs of OA from lost productivity greatly exceed direct medical care spending, ranging from 60 percent of total costs in Italy and Belgium to more than 80 percent in the Netherlands.²³

Data for Japan are not as abundant, but are the most complete and reliable numbers obtainable for Asia:

- LBP accounts for 62 percent of work-related disease that results in four days or more of “temporary retirement” from the work force;²⁴
- Differences in absence and presenteeism were large between employees reporting chronic pain and those without pain – 4.74 percent versus 2.74 percent reporting absence because of pain, and 30.19 percent compared with 15.19 percent reporting presenteeism because of pain – twice as many in both cases;²⁵
- Indirect costs of lost productivity for workers reporting moderate pain were the equivalent of US\$17,000 annually versus US\$9,500 for those without pain.²⁵

Impact of Chronic Musculoskeletal Pain on Employers

Figures 1 & 2 present the findings from an early IHPM Survey of 34 large multinational companies with a total of 1.2 million employees,²⁶ showing the leading health-related reasons reported for absence and presenteeism – with musculoskeletal (MSK) conditions leading the way:



FIGURE 2: Leading Reported Health Reasons for Presenteeism

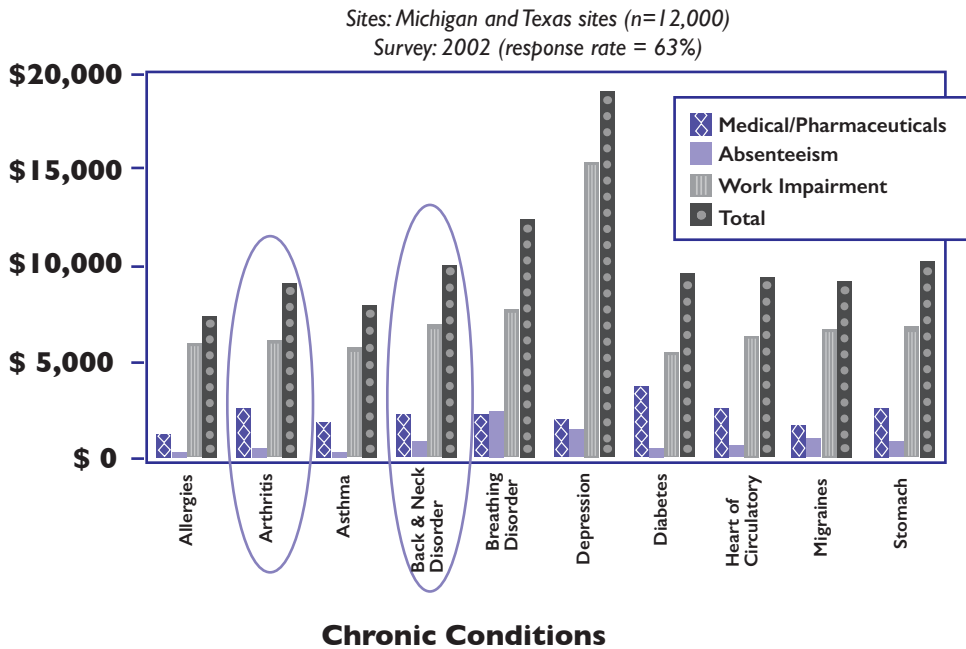


Figure 2 – Health & Productivity Management: Vol 1 No 3, of Health & Productivity Management, pages 4-6²⁶

- Musculoskeletal was the number one reported reason for absence from work, ahead of mental health and pregnancy
- Musculoskeletal was the number-two reported reason for presenteeism after mental health.

Figure 3 – published in the Journal of Occupational & Environmental Medicine²⁷ – depicts a landmark study carried out at the Dow Chemical Company.

FIGURE 3: The Impact of Presenteeism — Enormous!
The Dow Chemical Company



Conclusion: Presenteeism costs for each condition exceeded absenteeism and medical cost estimates by a factor of at least three in all cases but diabetes.

Source: J.Collins, C. Baase, et al, Journal for Occupational and Environmental Medicine, 6/05

This study found that about 80 percent of the \$10,000 per capita total cost burden of back and neck pain was accounted for by combined absenteeism and presenteeism (called in the study “work impairment”) – mostly the latter.

- These economic costs of lost productivity for back and neck pain were about 4 times the direct financial cost of medical care and pharmaceuticals.
- *Figure 3* also shows a similar situation concerning arthritis – with about 75 percent of the \$9,000 per capita total cost burden accounted for by absenteeism and presenteeism together – again, with the latter mostly responsible.

A survey on the impact of chronic pain on both absenteeism and presenteeism was conducted in the Big 5 European economies of Germany, the United Kingdom, France, Italy and Spain, with results published in the *Journal of Medical Economics*²⁸ that included the following key findings:

- Twice as many workers experiencing chronic pain reported absence from work, compared with those not reporting any pain – 18 percent versus 8 percent.
- A full two-thirds (68 percent) of workers experiencing chronic pain reported reduced

productivity while at work – presenteeism – compared with fewer than half of workers (44 percent) not reporting any pain.

- Presenteeism had a 3-times greater impact than absenteeism on reduced productivity for workers reporting chronic pain.

These European findings on the significantly larger impact of presenteeism than of absenteeism on the productivity of chronic pain sufferers reinforce the results in *Figure 3* above from the Dow Chemical study in the U.S.

A 2016 study of estimated absenteeism and presenteeism costs in the U.S. workforce by chronic condition, done by the *Center for Work Force Health and Performance at the Integrated Benefits Institute (IBI)*, August 2016²⁹, found that chronic back and neck pain resulted in the most lost work days – from absenteeism and presenteeism combined – and the highest lost productivity costs of any condition (roughly equal to arthritis and other chronic pain combined):

FIGURE 4: Center for Workforce Health and Performance at the Integrated Benefits Institute

	Percent of Workforce	Lost Work Days (millions)	Lost Productivity Cost (billions of \$)
Chronic back/neck pain	14.3	128.1	42.4
Other chronic pain	5.6	60.6	20.0
Arthritis	13.5	57.4	19.7

These three categories of chronic pain together accounted for 246 million lost-work-days from absence and presenteeism, and cost \$82 billion in lost productivity – 75 percent due to musculoskeletal pain.

**Chronic Lower Back Pain & Arthritis:
The Lockheed Martin Study**

**The Lockheed Martin Aeronautics
Employee Survey**

Condition	Prevalence	Average Productivity Loss	Aggregate Annual Loss
Migraine	12.0%	4.9%	\$434,385
Arthritis	19.7%	5.9%	\$865,530
Chronic lower-back pain (w/o leg pain)	21.3%	5.5%	\$858,825
Allergies or sinus trouble	59.8%	4.1%	\$1,809,945
Asthma	6.8%	5.2%	\$259,740
GERD (acid reflux disease)	15.2%	5.2%	\$582,660
Dermatitis or other skin condition	16.1%	5.2%	\$610,740
Flu in the past two weeks	17.5%	4.7%	\$607,005
Depression	13.9%	7.6%	\$786,600

Figure 5: Harvard Business Review

This table taken from the *Harvard Business Review*³⁰ shows the survey findings for prevalence of nine chronic conditions at Lockheed Martin Aeronautics, along with the average productivity loss and aggregate annual financial cost of presenteeism alone for each – and highlights the findings for Arthritis and Chronic Lower Back Pain (LBP)



Source: Hemp P. Presenteeism: at work – but out of it. *Harv Bus Rev.* 2004;10:49-58. ; Debra Lerner, William H. Rogers, and Hong Chang, at Tufts–New England Medical Center

- LBP and Arthritis are 2nd and 3rd, respectively, in prevalence after Allergies or Sinus trouble.
- They also are 2nd and 3rd in average productivity loss after Depression, and 2nd and 3rd as well in aggregate annual financial cost of lost productivity.

Figures 6.1-6.3 – Published in *Health & Productivity Management*, Vol. 4 No. 3 as an *IHPM Academy Brief* taken from the *Journal of Occupational and Environmental Medicine*. 2005; 47(7):658-670.³¹ These figures show the burden of chronic pain on productivity at Pitney Bowes Company, as measured by both absence from work and presenteeism, and also by the severity of the pain:

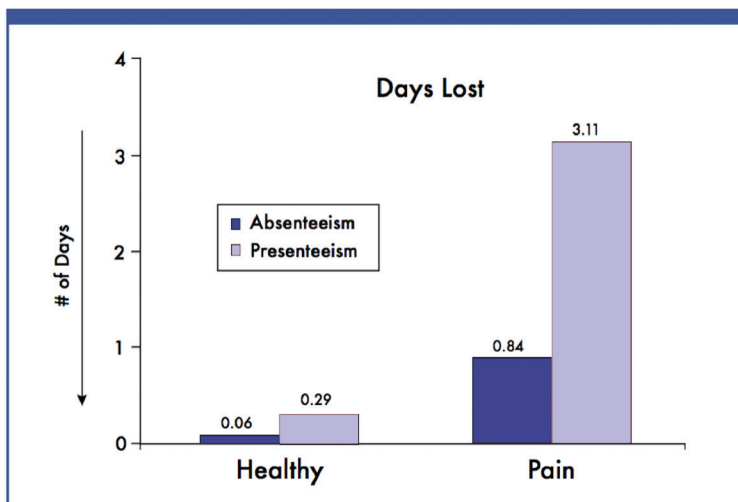


Figure 6.1: Pain and Workdays Lost to Health Problems: Last 4 Weeks

Employees suffering chronic pain lost the equivalent of four full days of work over the previous four weeks from absenteeism (.85) and presenteeism (3.11) combined – compared with one-third of a day for employees without pain.

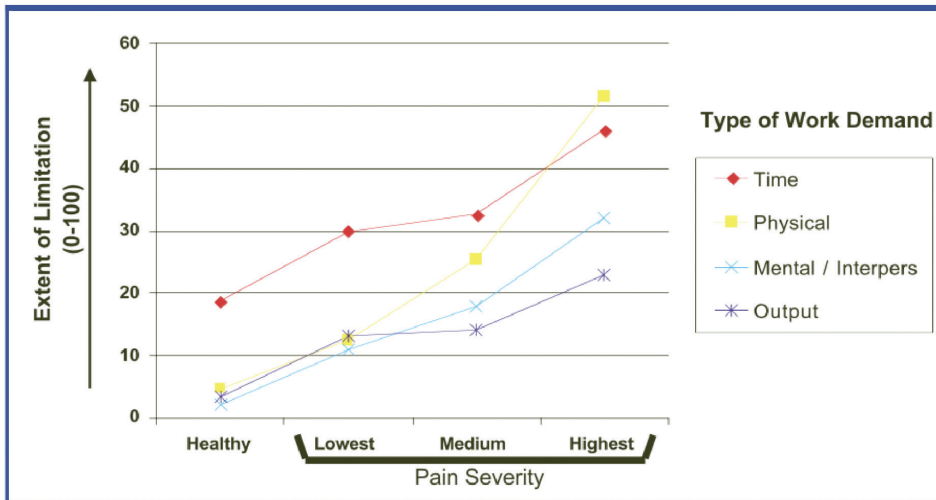


Figure 6.2: Burden of Pain on Performance at Work: Difficulty in Meeting Job Demands

The burden of chronic pain on performance at work increases dramatically with the severity of that pain, along all measurement scales of work limitation.

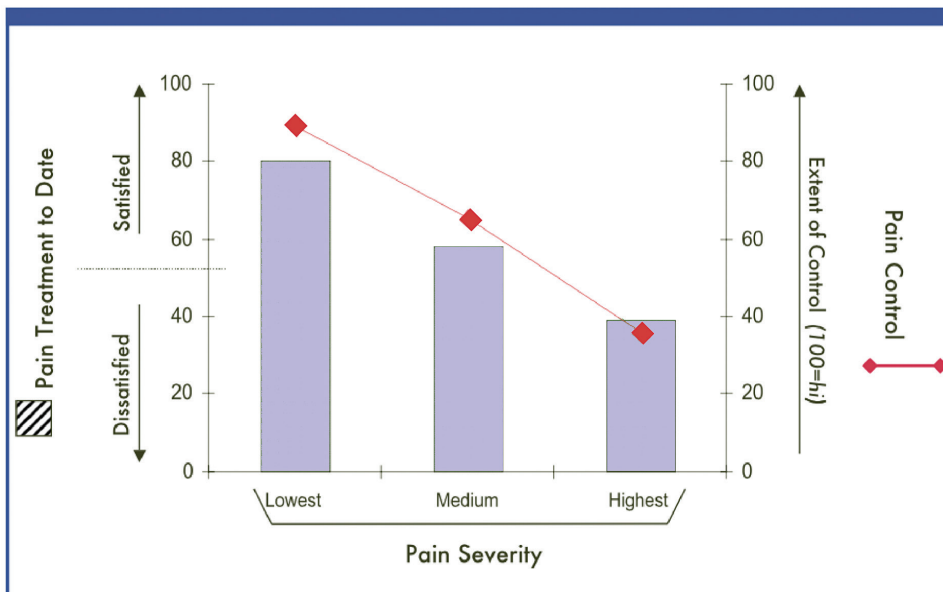


Figure 6.3: Management of Pain: Outcomes

Employees with the most severe chronic pain are least satisfied with their treatment to manage that pain – and will remain the most limited in their ability to perform the demands of their work.

In Conclusion

Musculoskeletal pain has a huge impact on the functional capacity to work – responsible globally for more than one-fifth of the total Years Lost to Disability (YLD),¹⁵ with Low Back Pain the single leading reason for YLD in every region of the world.¹⁵

In the United States, LBP and Osteoarthritis together account for one-third of all work disability.¹⁴ Chronic pain ranks at the very top in Europe,¹³ as well as the U.S., in its total impact on

day-to-day productivity – absence from work and presenteeism while at work – with suggestive evidence of similar impact in Japan.²⁵

Better management of moderate-to-severe chronic musculoskeletal pain presents an equally huge opportunity to improve the health and productivity of the workforce in all industrialized countries, as well as prevent the loss of prime-age skilled workers to early disability. It should be a public policy as well as a business health priority for the global workforce.

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