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How to Reduce the Other Two Thirds of Your Back Pain Losses

George Brogmus, MS, CPE, M.Erg.S.
Technical Director - Ergonomics
Liberty Mutual Group
Burbank, California

Abstract

Back pain is responsible for more workers compensation costs than any other type of injury. A promising new theory is that the pain is due to noxious or inflammatory effects of proteoglycans leaking through cracks in the outer layers of the disc. The leaks are more likely to occur during the hours after waking and during bending activities. Even the most effective back pain reduction approach, task redesign, can only reduce about one third of all back pain claims. That means that two thirds of the claims will persist. Future success in back pain claim and disability reduction lies in a multifactorial approach, including task redesign, but emphasizing self-care for back pain and enhancing supervisor response to injured workers.

Introduction

Back pain is responsible for about one third of all workers compensation costs, greater than any other type of injury or illness (Liberty Mutual, 2006; Hashemi, et al., 1997; Webster and Snook, 1994). A recent estimate of the cost of low back pain to the US is between $90 billon to $600 billion annually (Dagenais, et al., 2008). It has been said that the cost of low back pain is three times the cost of all forms of cancer combined (Jonsson, 2000). Over 90% of back pain is classified as idiopathic or nonspecific (Waddell, 2004) and no one knows for sure what causes it (Snook et al., 1998; Deyo and Weinstein, 2001; Campbell and Muncer, 2005). It is this nonspecific back pain that will be the focus of this paper.

For some time we have known that the most effective approach to reducing back injury claims is ergonomic task redesign – eliminating or reducing the exposure to heavy manual tasks and risk factors. Among “strenuous” manual materials handling tasks, task redesign can be expected to reduce two thirds of the associated injuries (Snook, et al., 1978). However, because not all manual tasks fall into a “strenuous” category, if task redesign were applied to eliminate all “strenuous” tasks, it is estimated that only one third of all back injury claims would be eliminated

(Snook et al., 1978). While this is good, it is not great, considering that two thirds of the claims would remain.

Despite this knowledge that task redesign can be very effective if directed toward strenuous tasks, and advances in safety and medicine, Snook (2004b) points out that there is no indication that back pain has decreased in recent years and that many researchers do not believe the pain itself can be prevented. These researchers have come to believe "that low back pain is an unavoidable consequence of life that will afflict most people at some point in their lives." (Snook, 2004b).

In this paper I will review some of the opinions of leading researchers on the efficacy of medical back pain interventions and, combining it with ergonomics research and what we now believe about the source of pain, I will suggest a strategy for reducing back pain disability.

Categories of Pain

While we can categorize back pain according to some functional markers such as impairment (some activities are limited), disability (some work activities are limited), claim (with insurance company), or compensation (replacement wages for time off work), the pain itself is subjective and the point at which an individual enters into any of these categories depends not only on physical work demands, but on a complex set of work and personal psychosocial factors (Volinn, 2006; Waddell and Burton, 2001; Waddell, et al., 2002). When a comprehensive view of the current research on back pain is considered, I believe these two factors, physical work demands and psychosocial factors suggest a rather clear strategy for reducing disability and compensation, and in some situations pain, impairment, and claims. I will describe this strategy and then support it with reference to recent research findings.

The Strategy

While increasing degrees of back pain is somewhat correlated to Impairment, Disability, Claims and Compensation, the threshold of when back pain becomes Claims, Disability, and Compensation is largely dependent on how painful it is to do the <u>work tasks</u> and how the worker <u>feels</u> about his/her company. An effective intervention strategy should, therefore involve:

1. Making really strenuous tasks easier.
2. Improving the way workers "in pain" are treated and facilitating early return to work.
3. Educating workers on what causes back pain and what they can do about it themselves.

Making Really Strenuous Tasks Easier

We know that task redesign is most effective among really strenuous tasks, reducing two thirds of the associated back pain claims. If we can make these strenuous tasks easier, it is less likely that a worker with back pain will feel as compelled to go off work due to the pain. To be effective and efficient at making really strenuous tasks easier, we need to be equipped with knowledge in the following areas:

1. Know what doesn't work.
2. Be able to identify really strenuous tasks.
3. Know what does work (and apply it to the really strenuous tasks).

Know What Doesn't Work

In our strategy we would not want to waste time on approaches that do not work. When it comes to back pain there are several approaches that are popular but have been shown to be ineffective at reducing back pain claims (and disability).

Hsiang et al. (1997) point out that one of the most frequently encountered administrative controls to reduce back pain claims is training in safe lifting technique. Unfortunately, what is taught about lifting technique is often not correct (Hsiang et al., 1997; Sedgwick and Gormley, 1998) and even the best programs have been shown to be ineffective (Daltroy et al., 1997; Snook et al., 1978; Martimo et al., 2008).

Another popular approach to reducing back pain claims has been to use a back belt. Consistently, good quality research has demonstrated that as a preventative approach, use of back belts are ineffective (Jellema et al., 2001; van Poppel et al., 1997, 2004; Waddell and Burton, 2001; Wassell et al., 2000).

Although there are benefits for considering implementation of worksite exercise programs for general fitness (Proper et al., 2003), there is only weak evidence that this has any effect on low back pain (Karsh et al., 2001; van Poppel et al., 1997, 2004). Recreational exercise may have an effect on reducing pain and disability (Hurwitz et al., 2005), after the initial episode. When the research documenting worksite exercise programs as a preventative approach for back pain are closely examined, the only studies that show an effect are aerobic exercise programs to nurses and firefighters (Karsh et al., 2001; van Poppel et al., 1997, 2004), and even these studies show a week effect and have methodological problems that cast doubt on their conclusions. Very few occupations have a work environment (and available time) that allows for on-site provision of aerobic exercise programs, nurses and firefighters being a notable exception.

Archaic worker placement techniques such back x-rays and subjective estimates of strength have been shown to be ineffective at reducing low back pain claims (Snook et al., 1978). However, even more current placement techniques have failed to demonstrate a proven benefit (Waddell and Burton, 2001). While a history of back pain is the best predictor of a future episode of back pain, there is strong evidence that use of MRIs (and x-rays) and "back function testing machines (isometric, isokinetic or isoinertial measurements) have no predictive value for future LBP [Low Back Pain] or disability" (Waddell and Burton, 2001). Furthermore, any placement approach will run into legal and practical issues. Even if there were good predicative value in a placement technique, inevitably you will still have some workers who will develop back pain and associate it with their work – despite all the investment made in placing the worker properly. At the same time some workers will be rejected from placement into jobs for which they might never have developed back pain and you will have potentially lost a great contributor to that job.

Training in generic lifting technique, mandatory use of back belts, worksite exercise programs, and various placement techniques should not be a central part of an effort to reduce back pain claims or disability. While some of these approaches may have some limited direct and/or

peripheral benefits, the abundance of evidence shows they are not effective at reducing back pain and disability. Therefore they can be a waste of an organization's time and resources.

Be Able to Identify Really Strenuous Tasks

What is meant by a "strenuous" task? Several methods have been developed to identify strenuous tasks. Using a psychosocial methodology and a detailed analysis of 191 compensable low back pain claims, Snook et al. (1978) found that when less than 75% of the industrial population could perform a manual material handling task without subjective overexertion there was three times the risk of a low back claim.

NIOSH's Lifting Equation used this 75th percentile (for females) criterion (from Snook and Ciriello, 1991) as their basis for the "best case" lift, setting the load constant at 51 pounds. NIOSH also incorporated a biomechanical criterion of 3.4 kN of compressive force on the L5/S1 disc and a physiological criterion of 2.2 to 4.7 kcal/min, depending on certain task parameters (Waters, et al., 1993). Marras, et al., (1999) found that the revised NIOSH Lifting Equation was able to identify 73% of the jobs associated with a high rate of back injuries, but only 55% of the low risk jobs, while the psychophysical approach (Snook and Ciriello, 1991) was able to identify 40% of the jobs associated with a high rate of injuries and 91% of the low risk jobs. The 40% may seem too low at first inspection (as Marras argued), but if the goal is to identify strenuous tasks WITHOUT misclassifying low risk jobs (that really should NOT be redesigned), then the psychophysical approach is far more advantageous since it results in far fewer unnecessary redesign efforts.

Know What DOES Work and Apply It To Strenuous Tasks

As mentioned previously, by redesigning strenuous tasks so they are not considered strenuous we can expect to eliminate two thirds of the back pain claims associated with these strenuous tasks (Snook, et al., 1978). A detailed review of task redesign principles is beyond the scope of this paper, but the reader can refer to books by Ayoub and Mital (1989) and Marras and Karwowski (2006) as well as numerous NIOSH and OSHA publications on practical ways to redesign manual handling tasks through ergonomics. Essentially, an effective redesign will attempt to:

1. Reduce weights and forces.
2. Reduce significant body motions such as low bending, high reaching and far (horizontal) reaching out.
3. Reduce or mitigate the effects of high frequency handling tasks.

The goal is to accomplish the above, through engineering and administrative controls, to the point where the task could be expected to be performed by 75% or more of the industrial population without overexertion.

Improving the Way Workers in Pain Are Treated and Facilitating Return to Work

If all we did was to redesign strenuous tasks to make them easier, then there would still be about two thirds of the existing back pain claims (Snook, 1978). To go beyond that, we must intervene in the realm of psychosocial factors. While there are several psychosocial factors that have been

linked with increased low back pain disability (Volinn, 2006; Waddell and Burton, 2001; Waddell, et al., 2002), controlled study interventions to address these factors have been few (Shaw, et al., 2006). Recall that the second phase of our strategy was to improve the way workers in pain are treated and to facilitate return to work. Low supervisory support is a known risk factor for low back pain (Elfering et al., 2002).

Shaw et al. (2006), picking up on this risk factor of supervisor support and combining it with an ergonomics-based work modification training program reported dramatic drops in claims in an intervention study. In a large food processing plant half the supervisors were given four hours training emphasizing:

- Communication skills
- Respect of Injured workers
- Ergonomic Accommodations for Injured Workers

The other half of the supervisors was used as a cross-over control group, receiving the training after 7 months of data collection. In the period after the initial training, lost time claims dropped by 47% and indemnity costs dropped 25% after the first 7 months and 76% after the second 7 months (for the first group trained). For the second group trained, there was a drop of 19% of lost time claims after the training and a corresponding drop of 36% in indemnity costs.

In a review of intervention studies, Frank et al. (1998) found that:

> There is substantial evidence indicating that employers who promptly offer appropriately modified duties can reduce time lost per episode of back pain by at least 30%... newer studies of guidelines-based approaches to back pain in the workplace suggest that a combination of all these approaches, in a coordinated workplace-linked care system, can achieve a reduction of 50% in time lost due to back pain, at no extra cost and, in some settings, with significant savings.

These results reveal a strong mitigating effect of supportive supervisor attitude combined with knowledge of how to make ergonomic accommodations for workers in pain so they do not have to leave the workplace. While there are many additional helpful things that can be done to facilitate staying on the job and/or returning injured workers promptly, these two elements, positive supervisory response and ergonomic accommodations, appear to be the critical elements for success.

Educating Workers On What Causes Back Pain And What They Can Do About It Themselves

The “extra” effort to keep workers with back pain in the workplace does not have as its sole motivation the desire to reduce employer costs associated with lost time. In the case of nonspecific low back pain (about 90% of all back pain cases), staying on the job is simply the best avenue for successful recovery. There are many myths and misconceptions about what causes low back pain and workers need to be better informed on the best way to deal with back pain when it occurs.

What Causes Low Back Pain?

By definition, nonspecific low back pain has no clear cause. Past theories on what causes back pain have been proven to be largely false. Despite it's prevalence in diagnosis (70%, Deyo and Weinstein, 2001), sprain or strain as a cause has not been proven. Depending on age and definition, up to 70% of people WITHOUT back pain have herniated discs, giving strong evidence that the presence of a herniated disc means precisely and only that – that they have a herniated disc (Deyo, 1998; Deyo and Weinstein, 2001; Waddell and Burton, 2001).

A relatively new theory that has implications for treatment and intervention is that idiopathic (nonspecific) low back pain is due to the noxious or inflammatory effect of proteoglycans (a protein substance found inside the intervertebral disc) leaking through cracks in the fibrous outer layers of the disc. Recent evidence indicates that proteoglycans can leak out of the nucleus (the jelly-like substance in the middle of the disc) and irritate the nerve endings in the outer third of the disc, causing low back pain (Snook et al., 1998) - or leak out of the disc entirely and irritate nerve roots in the surrounding tissue, causing sciatic pain felt in the lower back, buttock, and/or various parts of the leg and foot.

The leakage of the disc has time- and stress-dependent components. Under greater stress, more leakage can occur. During the hours immediately after waking, most of the fluid leaves the disc after having imbibed fluid from the surrounding tissues through osmosis due to lower pressure in the disc while lying down during sleep. When one wakes up, because of the extra fluid in the disc, the bending stress on the disc are estimated to be three times greater than later on in the day (Snook et al., 1998). So in the hours immediately after waking, you not only have most of the fluid transfer out of the disc, but your disc is also more susceptible to injury due to the increased fluid in it.

Furthermore, because it takes time for the inflammatory and/or noxious effect of the nuclear disc material to occur, associated pain can occur hours or even days later. This may be why back pain sufferers often report things like, "I felt something funny when I lifted that box and then the next day my back was in excruciating pain." Oftentimes pain suffers cannot identify a specific event that triggered the pain, or only do so because they believe they will not receive medical attention if they cannot identify a triggering event.

Different Treatment Approaches Are Equally Ineffective

A fair amount of research has been done to evaluate the effectiveness of back pain treatments. They all essentially have equal ineffectiveness, with some researchers concluding that little to no medical intervention is the best option. Although guidelines exist for physicians on how to deal with patients presenting with back pain, there is not good adherence to these guidelines, resulting in overdiagnosis and overtreatment.

Carey, et al. (1995) found that among patients with acute low back pain, the outcomes are similar whether they receive care from primary care practitioners, chiropractors, or orthopedic surgeons. However, primary care practitioners provided the least expensive care for acute low back pain. Cherkin, et al. (1998) found that for patients with low back pain, the McKenzie method of physical therapy and chiropractic manipulation had similar effects and costs. ***Patients receiving these treatments had only marginally better outcomes than those receiving the minimal intervention of an educational booklet.*** However, whether the limited benefits of these

treatments are worth the additional costs is questionable. Hurwitz, et al. (2002) found that chiropractic care and medical care for low back pain were comparable in their effectiveness. They also found that physical therapy may be marginally more effective than medical care alone for reducing disability in some patients, but the possible benefit is small. In a meta-analysis of research, Assendelft, et al. (2003) found that there is no evidence that spinal manipulative therapy is superior to other standard treatments for patients with acute or chronic low back pain.

In a Cochrane review of research, Engers, et al. (2008) found that for low back pain patients with symptom duration less than 12 weeks (acute and subacute), 2.5 hours of individual oral instruction was "as effective as non-educational interventions on long-term pain and global improvement." Specifically, in studies where 2.5 hours of patient education was provided, "Individual education appeared to be equally effective to interventions like chiropractic manipulation and physiotherapy for patients with acute or subacute LBP." This included therapies such as McKenzie therapy, cognitive behavioral group therapy, interferential therapy, heatwrap therapy, group exercise therapy, and "manual therapy and exercise."

The conclusions of the most recent European guidelines for the management of low back pain recommend that unless there is a clear symptomatic indication otherwise, for both acute (van Tulder, et al., 2006) and chronic (Airaksinen, et al., 2006) nonspecific low back pain, conservative treatments to reassure the patient, provide pain medication, encourage activity and exercise, and avoid bed rest are recommended. These guidelines recommend strongly against extensive diagnostic and treatment options, including surgery. The most recent US guidelines (Chou, et al., 2007) have similar recommendations, emphasizing self-care. They also point out that, "For most patients, first-line medication options are acetaminophen or nonsteroidal anti-inflammatory drugs." (The latter of these must be cautiously recommended because of association "with well-known gastrointestinal and renovascular risks.") The use of opioids in the treatment of low back pain, even when controlling for covariates such as injury severity, have been associated in a dose-response manner with longer disability, medical costs, and risk of surgery (Webster, et al., 2007).

Overdiagnosis results in overtreatment (Snook 2004a; Waddell 2004) which has been acknowledged (Deyo, et al., 1991; Frank, et al., 1998; Snook, 2004b) as iatrogenic (contributing to or causing disability). A few researchers (Cherkin, 2002 and Hrudey, 1991) have pointed out that much back pain disability is iatrogenic and to reinforce the importance of the medical provider providing coping counseling rather than over-treatment have quoted Voltaire (François-Marie Arouet, 1694 –1778): "the art of medicine consists of amusing the patient while nature cures the disease" (Hrudey, 1991)

Health care providers who follow accepted evidenced-based guidelines are preferred (Snook, 2004b and McQuirk, 1991). The European and US guidelines for the medical management of low back pain draw upon the best evidenced-based research that has been done and so have the best chance of resulting in reduction of pain and disability. Yet historically, not all physicians closely follow these guidelines. Webster et al. (2005 and 2006) surveyed 720 physicians on how they would diagnose and treat low back pain with and without sciatica (neither with red flags such as cauda equina syndrome). Their treatment responses were compared with the then-current US guidelines for treatment (Bigos, et al., 1994) from the Agency for Health Care Policy and Research (now named the Agency for Health Care Research and Quality [AHRQ]). For the scenario without sciatica:

- 23% overall did not follow diagnostic recommendations
- 45% of General Practitioners did not follow diagnostic recommendations
- Depending on specialty, 50-67% selected bed rest within the first 3 days (not recommended)
- Depending on specialty, 25-60% recommended Opioids for pain reduction (not recommended)
- 16% Overall Recommended Referral to a Specialist (not recommended)
- 7% of General practitioners indicated they would consider surgical referral!
- General practitioners and Physicians who had practiced longer were less likely to follow the guidelines.

For the scenario with sciatica:

- Two-Thirds overall did not follow diagnostic recommendations
- Over 70% of General Practitioners did not follow diagnostic recommendations
- Depending on specialty, 17-31% selected extended bed rest – greater than 3 days (not recommended)
- Exercise (which is recommended) was only recommended by 45% of physicians
- 83% Overall Recommended Referral to a Specialist (not recommended)
- Nearly half of the physicians indicated they would consider surgical referral! (not recommended)
- General practitioners and Physicians who had practiced longer were less likely to follow the guidelines.

Accepted medical management guidelines for idiopathic low back pain emphasize minimal diagnostic and treatment procedures. These treatment procedures largely fall under the category of self-care recommendations. It seems that even if evidenced-based medical treatment does make a substantial reduction in pain and disability (for which there is some evidence – McQuirk, 2001), it is hard to discriminate it from self-care. Furthermore, the recommended diagnostic and treatment guidelines are often not even being closely followed, muting the potential benefit of medical intervention.

Advocates for Self-Care

If medical treatment beyond self-care does not reduce disability (or may, in some cases prolong it – e.g., recommendations of bed rest), then what *can* be done to speed recovery? Some leading researchers have concluded that self-care (or educational instruction) may be the best option for people suffering from nonspecific low back pain.

Deyo (1998) has said, "The good news is that most back-pain patients will substantially and rapidly recover, even when their pain is severe. This prognosis holds true regardless of treatment method or even without treatment."

Deyo and Weinstein (2001) have said, "For most patients, the best recommendation is a rapid return to normal activities, with neither bed rest nor exercise in the acute phase [first three weeks]."

Waddell (2004) has stated that, "There is even an argument that we should discourage any health care for most low back pain and instead encourage people to deal with it themselves" and

“Clinical impression and psychological studies suggest that patients who accept personal responsibility for their pain do better than those who leave it to others. Those who feel it is entirely up to doctors or therapists or someone else to cure them do worse.”

Carey et al. (2002) in their review of the effectiveness of primary care physicians, chiropractors and orthopedic surgeons to manage back pain state that, “For acute low back pain, the best care may be minimal care.” Carey et al. then ask the question, “Do our findings simply reflect the natural history of acute low back pain, with essentially no modification by medical or chiropractic care?”

Biering-Sørensen and Bendix (2000) have said, “Patients, health-care providers, and employers should be aware that neither sick-leave nor inactivity with bed-rest benefits recovery from low back pain. All involved in therapy of low back pain need to shift emphasis from dependence to self-management strategies.”

Dr. James N. Weinstein, editor-in-chief of the journal Spine, in commenting about the importance of patient responsibility for health care decisions has said (Weinstein 2000):

> …if I had an acute backache, I would want to take two aspirin and try to keep moving. I would not want to go to the emergency room, I would not want a prescription painkiller, and I would not want to undergo radiography or magnetic resonance imaging. My decision about the management
> of my own backache would be strongly influenced by my beliefs, as an orthopedic surgeon specializing in backs, about the efficacy of invasive management for back pain, my aversion to the risks of surgery, and my conviction that aspirin and movement are as likely to be as effective
> in relieving my symptoms as surgery, at a fraction of the cost to me and to the health care system.

Snook (2004a) sums up the research by saying, “One of the messages for low back pain patients and their doctors is that sometimes less [medical] care is better - better for the patient and better for society.”

Interestingly, many physicians agree that back pain generally gets better on its own without medical intervention. Werner, et al. (2005) surveyed physicians, physical therapists and chiropractors as well as their patients in three Norwegian countries and found the responses given in **Table 1**.

Health Care Provider Belief/Patient Belief	"Back pain recovers best by itself"	"In most cases back pain recovers spontaneously in a couple of weeks, no matter what we do"
Physicians	74.6/24*	85.5/46.5
Physiotherapists	38.0/15*	54.2/30*
Chiropractors	0/7*	4.8/38*
Did Not Seek Care	NA/29*	NA/53.1

* Estimated from the published graphs (not quantitatively described in the text).

Table 1. Percent of respondents who agreed with the statements indicated. (Werner et al., 2005)

But can self-care work? There is some evidence that it can. In 1997 a campaign (Buchbinder, et al., 2001a, 2001b) was started in Victoria, Australia to alter pubic (and physician) opinions about back pain. The Australian state of New South Wales was used as a control group. In each state, data were collected via phone surveys and workers compensation claims. In each state over 2,000 surveys were collected from the public and over 1,000 from general practitioners. The campaign cost was estimated at about $3 million campaign (TV commercials, adds, billboards, seminars, evidenced-based info to health care providers, etc.). The content emphasis was on staying active, exercising, not resting for prolonged periods, and continuing with work. During the two and one half years of the campaign the state of Victoria experienced a 15% decline in back pain claims and a 20% reduction in claim medical costs. Days lost per claim also declined. The control state of New South Wales did not have these reductions. The researchers estimated they saved over $40M in direct costs for a $3 million investment (BackLetter, 2001). Three years after the campaign back pain belief improvements were still present (Buchbinder and Jolley, 2004, 2005).

Red Flags

Before reviewing the specifics of recommended self-care, it is important for individuals to be aware of "red flags" for which they should contact their doctor. The following is from Medline Plus (2008):

Call 911 if you have lost bowel or bladder control. Otherwise, call your doctor if you have:

- Unexplained fever with back pain.
- Back pain after a severe blow or fall.
- Redness or swelling on the back or spine.
- Pain traveling down your legs below the knee.
- Weakness or numbness in your buttocks, thigh, leg, or pelvis.
- Burning with urination or blood in your urine.
- Worse pain when you lie down or pain that awakens you at night.
- Very sharp pain.

Also call if:

- You have been losing weight unintentionally
- You use steroids or intravenous drugs.
- You have never had or been evaluated for back pain before.
- You have had back pain before but this episode is distinctly different.
- This episode of back pain has lasted longer than four weeks.

It should be pointed out that these recommendations say "call" your doctor; your doctor will advise you if a visit is necessary.

Self-Care Recommendations

Dr. Stover Snook, while a lecturer at Harvard's School of Public Health, has said, "The data are not perfect, but there is sufficient evidence in the literature to suggest the following self-care guidelines. Depending upon the degree of compliance, the guidelines should provide assistance for most people with nonspecific low back pain." (Snook, 2004a). His recommendations for self-care are summarized as follows:

- Nonprescription analgesics for pain relief. (Heed mfg warnings and instructions.)
- Remain as active as pain permits. Do not stay in bed.
- Ask your doctor if the McKenzie extension exercises are right for you. (McKenzie, 1997)
- Use ergonomic aids to reduce bending
- Take personal responsibility for managing your pain – don't expect others to fix you.
- Prevent the next episode by reducing heavy handling tasks and unnecessary bending.
- Reduce early morning bending (lumbar flexion).

This last point, I believe, is the key to more rapid recovery and deserves further elaboration..

Reducing Early Morning Flexion

Recall that the most current theory to explain idiopathic (nonspecific) low back pain is that the proteoglycans irritate and/or inflame the innervated outer third of the intervertebral disc and surrounding tissues by leaking through fissures in the disc. This leakage is most rapid in the hours immediately after one gets out of bed after sleep. Because of the "extra" fluid in the disc when one gets up after sleep, the back is more prone to increased bending stresses as well as subject to the noxious/inflammatory effects of the proteoglycans. If this theory is true, it would be expected that back pain would decrease if you could limit the amount of stress on your back during the hours immediately after getting out of bed after sleeping.

To test this theory, a very high quality research study was undertaken (Snook et al., 1998, 2002). Approximately 100 subjects were recruited who were:

- Experiencing Persistent or Recurring Low Back Pain
- Between 20 and 60 years old
- Not under health practitioner care
- Never had back surgery
- Not filed a WC claim for back pain
- Not pregnant

Half of the subjects (Treatment Group) were taught to control early morning flexion (bending); the other half (Control Group) were given a placebo ("sham") treatment of exercises known to have no effect on back pain. The instructions to reduce bending lasted about 45 minutes and were detailed, including specific instructions of how to get out of bed, how to rearrange morning activities to eliminate the need for bending, toilet instructions and how to get dressed. No bending whatsoever was recommended during the first hour. Restrictions on bending continued up to 6 hours after waking. A back-scratcher and a pinching extended handle gripping tool was provided to each subject so they could reach things without bending. Even with over 90% of the subjects reporting difficulty in complying with the instructions, significant reductions in pain, impairment and medication need were achieved. A baseline of pain and other measures were recorded on daily diaries for 6 months before the treatment and placebo instructions. After 6 months from the initial training, the control group was taught early morning flexion control and tracked for another 6 months. Sixty subjects completed the entire 18 months, with the results summarized in **Table 2**.

Measure	**Reduction at 6 Months (Initial Experimental Group)**	**Reduction at 12 Months (Initial Experimental and Control Groups Combined)**
Mean Pain Intensity	29%	36%
Mean Pain Days	23%	31%
Mean Impairment Days	43%	64%
Mean Medication Days	38%	39%

Table 2. Percent Reductions In Pain, Impairment and Medication Need.

In addition to the results summarized in **Table 2**:

- 35% of subjects reduced their pain by more than 50% after 6 months!
- 80% of the subjects said they intended on continuing early morning flexion control
- Benefits of early morning flexion control were the same for young and old, male and female, w/ or w/o leg pain, and w/ or w/o high psychological overlay (e.g., depression).
- As might be expected, those who perform heavy physical work on their jobs did not benefit as much as those with moderate or light jobs.
- A follow-up study, 3 yrs after the end of this one, found that subjects who continued the treatment (50 subjects) reduced their number of pain days per month by 56%!

Conclusions

While it continues to be a priority to reduce the strenuousness of manual handling tasks, in order to make a meaningful reduction in back pain disability, the benefits of supervisory support for injured workers and self care must be applied. Many approaches to reducing back pain claims have failed to prove effective. Even the most effective and practical approach, task redesign, can only reduce about 1/3rd of all back pain claims if directed toward the most strenuous physical tasks. But that still means that 2/3rds of the claims will persist. Future success in back pain claim and disability reduction lies in a multifactorial approach, but the keys to this success lie in:

- Redesigning the really tough manual tasks so they are easier.
- Embracing the best theory on back pain causation (Proteoglycan fluid effects).
- Recognizing the importance of controlling early morning flexion.
- Supporting worker education on the natural etiology of back pain and the essential role of self-care.
- Complementing worker education with supervisor training on responding positively to injured workers.

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