

telespine

**Web-based Telehealth for Low Back Pain:
Higher Quality of Care, Better Outcomes, and Lower Cost**

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Introduction

Due to an incredible amount of pressure through the system, the healthcare industry is finding and adopting new ways to deliver care to more demanding, better-educated healthcare consumers. To the benefit of all stakeholders, individual healthcare providers and healthcare systems are employing “telehealth” technologies to more efficiently deliver and manage patient care. The use of telehealth is having a significant, positive impact on quality, cost-effectiveness, and the healthcare experience of individuals suffering from some of the most debilitating and costly conditions in this country. Providers and health systems are greatly benefiting by lowering the costs of delivering care and improving profitability while better serving the needs of their most important asset - the patient.

Telehealth, the marriage of technology and care delivery models, couldn't be better suited for low back pain (LBP), one of the country's most prevalent and costly conditions. What will be revealed in this white paper is not only that LBP is pervasive and over-medicalized, but is also one of the most preventable and treatable conditions, and one that can be treated effectively at significantly lower cost. For most cases, LBP is a relatively straightforward problem of posture, strength, and awareness. Unfortunately, the traditional care model for LBP is full of clinical and financial inefficiencies that drive up costs without a corresponding improvement in outcomes (Deyo 2007). Telehealth solves these problems by giving providers the capabilities they need to better support their patients and gives patients the personalized tools, information, and access to the professional guidance they need to more effectively self-manage their condition.

This white paper will address:

- The cost and prevalence of LBP
- The adoption and success of telehealth in treating costly conditions
- How telehealth is perfectly suited to treat LBP
- How telehealth empowers patients and enables better outcomes

Low Back Pain - Prevalence and Cost

"People with back problems cost 76 percent more on average than people without back problems each year." Brook Martin MPH, a leading research scientist in LBP at the University of Washington

In terms of costs, low back pain (LBP) is right up there with coronary heart failure COPD, asthma, and diabetes. The estimated cost of chronic diseases in the United States, including treatment and lost productivity in 2007 was \$1.7 trillion per year and is on track to more than double in the next decade (Andersson 1999). Unless this trend is reversed, by 2023 the cost will swell to \$4.2 trillion (Deyo 2007). LBP affects at least 80% of us some time in our lifetimes and 10% of us at any given time, which are roughly 33 million individuals. Unlike many conditions, it is usually recurrent (Wasiak 2009), and subsequent episodes tend to increase in severity and associated costs. When poorly managed, which is common in today's healthcare delivery model, it becomes chronic.

Low back pain is second only to upper respiratory problems as a symptom-related reason for visits to a physician (Andersson 1999 Hart 1995). In addition, once diagnosed, there is evidence of excessive imaging and surgery for low back pain in the United States (Carey 1996), and many experts believe the problem has been "over medicalized" (Hadler 1998) by treating it with expensive, invasive interventions that are of questionable value in terms of cost-effectiveness (Deyo 2001, Weinstein 2006). These interventions, including surgery, injections, and long term pharmaceutical use are generally ineffective, incur more risk, and are significantly more costly. Often, patients who receive these aforementioned interventions end up back in the emergency department (Deyo 2009).

Today, the yearly expenditures for this condition are roughly \$100 billion per year in direct and indirect costs and growing at about 8% per year. The cost of compensable low back pain was \$2,110 per episode back in 1986 (Webster 1990) and today the cost per episode is calculated at \$4,020 (Martin 2008). This figure does not include the average cost of lost worker productivity at \$1,900 per episode (AMA 2009).

Low Back Pain in the Workplace

Global estimates of work-related low back pain from the WHO World Health Survey show the prevalence was 38% of the total population and somewhat higher in wealthier countries at 42% (SangWoo 2006).

- Back pain is the most frequent cause of workers' compensation claims representing about 25% of all claims and about 33% of all compensation costs. It affects about 4.6% of the US workforce and is 2x more prevalent among white collar than blue collar workers (Anju 2005).
- This condition accounts for 40% of all sick time usage, second only to the common cold. As far back as 1990, In the United States, the direct healthcare cost for back pain was \$24.3 billion and the indirect cost in terms of productivity loss ranged from \$75-\$100 billion (Frymoyer 1991).
- Lumbar injuries result in approximately \$149 million in lost work days per year. Workers Compensation costs per low back pain episode were \$8,723 in 2002, adjusted at 8% growth/year it is today roughly \$13,607, which includes CPI inflation for medical costs and CPI inflation for wage replacement benefits (Silverstein 2005).

The tremendous costs associated with LBP in the work place include lost productivity and work absenteeism, the expense of medical, rehabilitation and surgical interventions, and quality of life decline associated with disabling pain and limited daily function. The costs for treatment and compensation for LBP is greater than the total amount spent on all other industrial injury types combined (Rainville 2009).

Recurrent back pain in the workplace is very high and accounts for the greatest compounded expense of the condition. The rate of recurrent care seeking was 33.9% and individuals with recurrence had significantly higher total length of work disability and higher medical and indemnity costs. Individuals who have recurrences may be an especially important target for secondary prevention efforts to lower cost and improve productivity (Wasiak 2006).

Mechanical LBP is Most Common

Mechanical low back pain is the most common types of low back pain and makes up 97% of all types of low back pain. Non-specific low back conditions, such as lumbar sprain or strain and caused by acute injury, repetitive trauma, and poor posture during activities, make up greater than 70% of all cases (Deyo 2001). These non-specific low back conditions are precipitated in most patients by de-conditioning and poor strength of the deep stabilizing muscles of the spine, the “core” muscles (Richardson 1999, Hides 2001). Of these mechanical causes, 10% are due to age-related degenerative changes in disks and facets, 4% are due to herniated disks, 4% are due to osteoporotic compression fractures, and 3% are due to spinal stenosis. All other causes, such as cancer, account for less than 1% of cases (Deyo 2001).

The Definition of Telehealth and Telemedicine

“The future of medicine is telemedicine.” C. Everett Koop, MD, ScD, former Surgeon General of the United States

The World Medical Association defines telemedicine as “the practice of medicine over a distance, in which interventions, diagnostics, treatment decisions, and recommendations are based on data, including voice and images, documents, and other information transmitted through a telecommunication system” (WMA 2010).

More broadly, telehealth can be described as the intersection between health and technology where healthcare is more accessible and convenient to patients, quality is raised, and costs are reduced. Telehealth can impact the entire range of activities that support and enable better patient health. Prevention, promotion, education, diagnostics, and treatment are all areas where providers using telehealth can play an important role (WMA 2010).

Health insurers, healthcare providers, and technology vendors are accelerating the use of telehealth solutions and services to make healthcare more accessible and convenient to patients, to raise quality of care and to reduce costs (Herrick 2007). As telehealth and telemedicine programs become readily available, patients and providers will find that telehealth supports and improves many aspects of healthcare delivery and the business of healthcare.

Telehealth Drives High Quality, More Cost-Effective Care

"The fields of technology and medicine are constantly advancing, and Mayo Clinic Health Manager will continue to evolve so our users will always have the best health information and tools." Sidna Tulledge-

Scheitel, Mayo Clinic Medical Director of Global Products and Services

Timely, accurate, and actionable information that can be shared via telehealth solutions is leading to significant cost-savings and healthier patients. Some examples are:

Automated Physiologic Monitoring

Collection of physiologic data can take a variety of forms. A recent study compared the effectiveness of daily self-monitoring with patients with Coronary heart failure (CHF) of weight, blood pressure, heart rate and oxygen saturation with home nurse visits. Physiologic monitoring was performed on patients in their homes with the information transmitted to a secure Internet site for review by the patients' cardiologists. There was a 40% reduction in heart failure admissions among the telemonitored group compared with the nurse home visit group. The daily cost of the telemonitoring intervention was reported to be \$2.87 and the 6 month cumulative readmission charges were \$223,638 in the telemonitoring group and \$500,343 in the group receiving nurse visits (Benatar 2003).

Patient Adherence and Cost

Research has shown that telemedicine can improve adherence to treatment protocols and increase convenience for patients with chronic ailments (Jan 2007). For example, patients with chronic obstructive pulmonary disease (COPD), researchers determined that telemedicine lowered readmission rates. Patients were trained in the use of an inhaler for drug therapy (to improve lung function) and the use of a spirometer to monitor airflow to and from their lungs. Of those monitored from home, only 49 percent were subsequently readmitted to a hospital compared to 67 percent of COPD patients who were not monitored remotely (Toledo 2006).

Evolving Care Delivery and Consumption Channels

Kaiser Permanente recently studied the impact of KP HealthConnect™, Kaiser Permanente's comprehensive health information system, on ambulatory patient care interactions. These included outpatient, urgent care and emergency department visits, scheduled telephone visits, and secure patient/provider email messaging. The study was based on Kaiser Permanente's 225,000 members in Hawaii and found that after the implementation of KP HealthConnect™ between 2004 and 2007, office visits per member decreased 26.2 percent, total scheduled telephone visits per member increased nearly 900 percent. Secure e-mail, which began in late 2005, increased nearly six-fold by 2007 (Chen 2009).

In addition to the convenience of fewer office visits and the benefits of faster resolution of health issues, e-mail messaging and scheduled telephone visits saved consumers the often overlooked out-of-pocket expenses for travel, parking, and time lost that would otherwise be spent at work or other pursuits (Reuters 2009).

Patient Satisfaction with Telehealth

Patient satisfaction with telemedicine is very high at 98.3% and for good reason (Gustke 2000). Reduced costs and more convenient access to personalized therapeutic content and provider guidance strongly encourage patients to adopt and utilize telehealth solutions.

A telepsychiatry study on patient satisfaction indicated “most consumers found that a video link with a psychiatrist moderately or greatly helped them in managing their treatment, with 98% of the preferring to be offered videoconferencing in combination with local services” (Janca, 2000).

Telehealth is safe, efficient, and convenient for both patients and providers. It is often cited as the method preferred by patients who demand timely access to their doctors. Many medical conditions and testing procedures do not require the physical presence of a physician or the time and expense of an office visit. Telehealth solutions answer the problems of cost, access, and convenience while achieving desired outcomes.

Telehealth solutions may in fact be the perfect vehicle to effect the greatest therapeutic change in patients and lower cost for all stakeholders. Telehealth closes the distance and collapses time between provider and patient and enables faster insight into the patient’s condition, progress, and ongoing needs.

Key Factors – Achieving More Cost-Effective LBP Outcomes

“There is a vicious cycle in which uncoordinated care contributes to further patient suffering- both for lack of integrated approach at the provider level and from patients’ own lack of knowledge and skills to help themselves.” Dr. James Schibanoff, Editor-in-Chief Milliman Guidelines

Research clearly shows that people with low back pain get better faster and have less pain when they consistently participate in healthy activities and do specific exercises that promote a healthy spine. The key word is participation, but how do we get patients to participate? Patients are classically poor performing partners in their own healthcare. They often do not fully participate, nor take responsibility for their own health. Compounding this problem is the nature of our healthcare system, which fragments continuity of care. The misalignment of incentives for all stakeholders lends to episodic care where providers are financially rewarded by a fee-for-service compensation. The current system is not supported by research which shows that ongoing support, guidance, and communication from a healthcare provider helps people with back pain get better faster. Web-based telehealth enables a more collaborative provider/patient relationship, promotes patient self-management, and can facilitate more successful clinical outcomes in patients with LBP and many other types of musculoskeletal conditions.

Key components of telehealth that drive more successful and cost-effective outcomes are:

- Early intervention
- Patient participation
- Implementation of an active plan of care

- Provider/patient communication
- Shared decision making
- Use of evidence-based protocols
- Patient monitoring and feedback

Telehealth solutions that integrate the entire compliment of key components are perfectly suited to address musculoskeletal conditions, such as LBP, where patient participation plays a critical role in outcomes.

The Importance of Early Intervention on LBP Outcomes

Due to the nature and progression of low back conditions, there should be a greater attempt in orthopedic rehabilitation models to prevent acute low back pain patients from becoming chronic patients with greater disability. Research on early intervention clearly indicates that high-risk acute LBP subjects who received early intervention displayed statistically significant fewer indices of chronic pain disability on a wide range of work, healthcare utilization, medication use, and self-report pain variables relative to the high-risk subjects who do not receive such early intervention.

In addition, the high-risk non-intervention group displayed significantly more symptoms of chronic pain disability on these variables relative to the initially low-risk subjects. Cost-comparison savings data were also evaluated. This data shows there are greater cost savings associated with the early intervention group versus the group that did not receive any early intervention (Gatchel 2003).

Logically, muscular support to the spine and function should be restored as soon as possible following an injury to the back. It is a common clinical belief and practice to prescribe rest and limited activities to individuals with acute LBP, which in the very short term, may prevent further injury (Kinkade 2007). In contrast to this standard approach, research shows that early motor training (specific strengthening exercises of the spine) is not harmful and very effective in returning proper function of the muscular system (Hides 1996). Early intervention and recovery from acute low back injury (defined as < 1 month) by training the deep spinal muscles can take only 2-3 weeks (Hides 1996), where as recovery from chronic low back pain (defined as >3 months) by training the deep spinal muscles can take 6-10 weeks. (O'Sullivan 1997). The evidence clearly shows that an early intervention approach giving patients an active and specific plan of care is safe and most effective.

Technology can also play a key role in early intervention shortly after care starts. The Cleveland Clinic and its patient-centric chronic care management program uses remote monitoring devices. These devices permit continuous health data transmission enabling its providers to adjust medications and therapeutic regimes on an ongoing basis. They have seen a reduction in hospitalizations, more robust health outcomes, and importantly, lower costs. Telehealth applications that allow for more real-time information to be shared between patient and provider as the condition changes can have a greater effect on the course of care, slow or halt the progression of disability, and promote a more timely resolution (Sarasohn-Kahn 2009).

The Value of Active vs. Passive Plans of LBP Care

“It is well established that the lifetime incidence of low back pain is extraordinarily high, but those who incur the majority of cost, both personally and financially, are the persons who suffer recurrent and persistent or chronic pain” Carolyn Richardson, PhD Department of Physiotherapy, University of Queensland, Australia, Pioneer in spinal stabilization exercise and research

There is evidence that manual ‘hands-on’ therapy treatment methods used by physical therapists and chiropractors can be effective for the relief of pain and restoration of motion in the short term (Anderson 1992), but these treatment methods have not met the challenge of lessening persistent and recurrent episodes of low back pain (Richardson 1999). As a component of musculoskeletal physical therapy, the spinal stabilization program (specific low back exercises) is more effective than manually applied therapy in treating chronic low back disorder over time (Goldby 2006).

Further, research has identified that with acute first-episode low back pain and subsequent untreated chronic low back pain the deep stabilizing muscles of the spine are immediately inhibited leading to a cascade of inefficient spinal structure compensations (Hides 1996, Hodges 1996). Introducing an active exercise program that specifically reactivates and train these important supporting muscles of the spine is critical for the return of function and reduction in pain (Jull 2000).

Deficits in the spinal stabilizing muscles have been identified in acute LBP patients and do not resolve spontaneously on resolution of painful symptoms and resumption of normal activity. The relation between this deficit and recurrence rate was investigated in the long-term. Patients were compared given two different intervention strategies (Hides 2001).

One group intervention consisted of exercises aimed at rehabilitating the spinal stabilizing musculature. The other was “medically managed” that included advice and use of medications. 1 year and 3 years after treatment, telephone questionnaires were conducted with patients. 1 year after treatment, specific exercise group recurrence was 30%, and control group recurrence was 84%. 2 to 3 years after treatment, specific exercise group recurrence was 35%, and the medical management group recurrence was 75% (Hides 2001).

Long-term results suggest that specific exercise therapy in addition to medical management and resumption of normal activity may be more effective in reducing low back pain recurrences than medical management and normal activity alone (Hides 2001).

Given the impact of the problem, there is a need for effective treatment interventions and delivery models in occupational healthcare aimed at the prevention of chronic disability and the speedy return to work (Rainville 2009). In the currently fragmented, reactive model of care delivery where 98% healthcare spending goes toward treating illness and only about 2% toward prevention and wellness, a proactive, early intervention approach is needed when treating LBP. Individuals with chronic or recurring LBP often experience difficulties returning to work due to disability. Given the personal and financial cost of LBP, there is a need for effective interventions aimed at preventing LBP in the workplace. An extensive systematic review was conducted to examine the effectiveness of exercise in decreasing LBP incidence, LBP intensity, and the impact of LBP disability. There is strong evidence that exercise is effective in reducing the severity and activity interference from LBP. (Bell 2009)

Exercise is a widely prescribed treatment for chronic low back pain and has demonstrated effectiveness in improving function and work tolerance. Exercise is safe for individuals with back pain and does not increase the risk of future back injuries or work absence. Substantial evidence exists supporting the use of exercise as a therapeutic tool to improve impairments in back flexibility and strength. Most studies have observed improvements in global pain ratings after exercise programs and many have observed that exercise can lessen the behavioral, cognitive, affect and disability aspects of back pain syndromes (Rainville 2004).

Dynamic and engaging exercise prescriptions for low back pain can be much more effectively and efficiently delivered via web-based telehealth. Both provider and patients can provide more responsive feedback about the active plan of care, make modifications to facilitate progression, and achieve more successful outcomes.

Provider/Patient Communication Improves LBP Care

Where the rubber hits the road in achieving the best possible outcomes in patients with low back pain, or any condition for that matter, is the communication and trust that exists in the provider/patient relationship. Jane Sarasohn-Kahn has described in her white paper (Participatory Health: Online and Mobile Tools Help Chronically Ill Manage Their Care) the benefit of near-continuous monitoring and communication. She states, “consider the time patients are not interacting with a provider. This has been referred to ‘rest of the time’ and creates a perfect opportunity gap that online healthcare solutions and services can bridge”.

Positive, thorough, and clear communication is critical. Studies have shown a great impact on functional and return to work (RTW) patient outcomes when the patient felt their provider took their problem seriously, explained the condition clearly, tried to understand job requirements, and gave advice to prevent re-injury has. Additionally, employees with work-related LBP place a high value on provider counseling and education, especially during the acute stage (<1 month) of treatment (Shaw 2005).

Patients rate “conversations with my doctor” as the #1 most valuable source of healthcare information amongst all available sources. Patients place the most value on this type of communication because of the trust, authenticity, and satisfaction associated with it (Eldelman 2008).

Telehealth applications provide a convenient, effective environment for patients and their providers to communicate in a timely manner. Payers like CIGNA and Aetna began offering “e-visits” as early as 2003 and expanded their network nationwide in 2008 (Christopher 2008). They are seeing more convenient access for their members, more efficient and effective use of the physician’s time, and improved physician-patient communication.

Evidence-Based Protocols and LBP

“Good doctors use both individual clinical expertise and the best available external evidence, and neither alone is enough” D.L. Sackett M.D., author of How to Practice and Teach EBM

The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence to make the best clinical decisions and achieve optimal outcomes. There is a large body of interventional evidence looking at treatment guidelines for most medical and chronic

musculoskeletal conditions. The evidence for treating both acute and chronic low back pain is clear and gives a simple roadmap to help patients get better in the most cost-effective way.

There is a strong correlation between adherence to evidence-based guidelines for active physical therapy care, clinical outcomes, and subsequent utilization (i.e. utilization of healthcare service 1 year after completion of physical therapy). Adherence to recommended active evidence-based care is associated with better clinical outcomes and decreased subsequent use of prescription medication, MRI, and injections. Patients receiving evidence-based care had fewer physical therapy visits with lower charges (a mean difference of \$167), and greater improvement in pain and disability (Fritz 2008). Simply put, using evidence-based protocols improves the cost-effectiveness of care for acute LBP.

In addition, the use of an evidence-based care models lead to greater adherence, better outcomes, and lower costs for patients receiving workers' compensation (Fritz 2007). Web-based telehealth provides a dynamic vehicle to deliver and instruct patients in an active plan of care they can then participate in anytime, anywhere.

Facilitating Healthy Behavior, Monitoring Progress, and Feedback

“Doing remote monitoring is a great idea, but in and of itself it’s not enough. Feeding back to the patient immediately is also necessary. Tools that absorb data and present it to a back-end, like home monitoring, don’t close the loop.” Mark Blatt, M.D. Developer of Intel’s Health Guide

Patients need to adopt healthy and/or therapeutic behaviors to get better. Telehealth applications that incorporate patient participation and progress monitoring can have a great impact on behavioral change. When patients know they are being monitored they are made more accountable to themselves, the process, and their provider. Also, when they are given progress feedback by using outcome measure tools such as the Oswestry Disability Index, providers can make personalized refinements to care and patients can better understand the benefits of their behavioral change.

Programs to manage chronic medical conditions are beginning to use remote monitoring to keep patients safer and out of the ER, achieve better clinical outcomes, and facilitate healthy self-management behavior. These involve training patients to collect and transmit data on their condition and allowing them to receive physician feedback. Research has shown such monitoring not only can improve patients’ adherence to protocols, but improve desired outcomes. (Herrick 2007)

In particular, care delivery systems without feedback mechanisms linking the patient back to a clinician or health coach may be effective in improving interim outcomes, but are not likely to achieve longer-term benefits (Sarasohn-Kahn 2009). Given the right tools, the patient is the most important agent of health status change. Telehealth monitoring applications and devices provide the timely, behavior-changing feedback patients need to successfully impact outcomes and lower costs.

Telehealth – Patient Empowerment and Better LBP Outcomes

“People want to be empowered to self-monitor their health to ensure that they are following their doctor’s care plan” Sidna Tulledge-Scheitel, Mayo Clinic Medical Director of Global Products and Services

Patient empowerment, and the benefits that come with it, requires giving patients capabilities that are not readily supported in the traditional healthcare model. Web-based telehealth addresses these deficiencies and views patient-centric care and empowerment as critical to the achievement of better outcomes.

Patient Education

With the proper patient education, care providers can improve their patients’ behaviors and help them become active participants in their own care, leading to an overall improvement in health and outcomes.

There is a vast amount of knowledge available on the Internet, which has led to dramatic changes in how people obtain information about health and medicine (Cristiano 2002). The number of “ehealth” consumers has more than doubled since 2002 reaching 146 million in the U.S. in 2008 (Manhattan Research 2008). Also, people with chronic health conditions, such as chronic LBP tend to use online health information more often than other adults (Fox 2009). For patients who are online and interested in understanding what’s wrong with them and how to get better, it would seem important that the information they receive is credible and relevant to their specific condition, set of symptoms, and health needs. The Mayo Clinic and Cleveland Clinic make patient portals available in conjunction with their PHR and communication applications to provide the most up-to-date information and fully engage their growing number of participatory patients.

For the injured worker, education and counseling regarding pain management, physical activity, and exercise can reduce the number of days off work for employees with fear-avoidance beliefs and acute low back pain. Employees with acute low back injury and fear-avoidance beliefs are at risk for remaining off work for an extended period of time. A study looking at low back injury education found that injured workers with low back pain who are educated about their condition returned to regular work duties within 45 days compared to workers not in the education program. One third of the participants in the comparison group (no education) remained off work at 45 days. There was a statistically significant difference between the groups with regard to the number of days before returning to work (Godges 2007).

Patient education is an effective method to empower patients through a process of assessment, education and skill development. Quantitative and qualitative outcome measures, including decreased pain and improvement in quality of life, are significantly better for patients who participate in educational programs (Tavafian 2007).

There is also strong evidence that LBP patients can benefit from individualized biomechanical treatment/ educational booklets, such as Treat your Own Back. Acute and even chronic LBP (patients with an average of 10.4 years of symptoms and extensive use of the medical system) greatly benefited after they finished reading the treatment booklet. 51.62% reported noticeable improvement in their pain. At a 9-month follow-up, there was statistically significant and clinically relevant improvement in reported pain magnitude, number of episodes, and perceived benefit. At an 18-month follow-up, these gains held or demonstrated even further improvement (Udermann 2004). This study’s results suggest that the Treat Your Own Back book may have

considerable efficacy in helping patients decrease their own low back pain and reduce the frequency of, or even eliminate, their recurrent episodes (Udermann 2004).

To better push health literacy information to patients, web-based and mobile telehealth platforms allow the sharing of relevant, clinically meaningful information that can be personalized to patients with low back pain. However, patient education should not be limited to just condition-specific articles, but also include other patient-centric data. David Cerino, general manager for the Consumer Health Solutions Group at Microsoft states, “when patients are armed with this information, such as their health data, performance, and outcomes, they are more engaged in their care and feel empowered by knowing the numbers” (Booz 2009)

The Fear Avoidance (FA) Problem

A potent and prevalent factor limiting a patient’s progression through a successful rehab program for low back pain is the fear of pain. Pain anticipated before and induced by physical activities has been shown to influence the physical performance of patients with chronic back pain and impede their confidence in overcoming discomfort and subsequent fear of pain doing their required activities. This perception of real or anticipated future pain is one primary reason patients with low back pain avoid physical activities and a return to daily activities, such as work. This is called ‘fear-avoidance’ which is a cognitive-behavioral problem that explains why a minority of acute low back pain sufferers develops a chronic pain problem (Leeuw 2007). It seems counter intuitive, but an exercise-oriented physical therapy program for chronic back pain can have a great effect on reducing anticipated and induced pain with physical activities. In addition, active programs improve physical performance levels and decrease global pain and disability ratings. These findings may help explain how exercise exerts a positive influence on chronic back pain and disability (Rainville 2004). It is also widely validated that patients with low physical activity (i.e. sedentary) have significantly higher scores in fear-avoidance beliefs and pain measures. It is critically important for physical therapists to measure levels of fear-avoidance beliefs and pain and is of real value for clinicians when making treatment decisions concerning physical exercise therapy for patients with chronic LBP (Elfving 2007).

Further research in a sub-set of FA known as kinesiophobia (fear of moving), which is a common component of acute and chronic low back pain, demonstrates that an education and quota-based exercise physical therapy program yields both clinically and statistically significant improvements in flexibility, strength, and lifting ability. The same degree of improvements in back pain, disability, and measures of kinesiophobia were also noted at discharge and maintained at 12-month follow-up. In this study, kinesiophobia decreased during an intensive physical therapy program in which exercises were performed in a quota-based manner. Following the successful performance of non-pain-contingent, quota-based exercise, patients’ fears of injury lessened and this had a positive influence on disability (Keman 2007). Therefore, an active progressive plan of care is better than one that promotes rest and being sedentary.

Telehealth applications can support an increase in patient confidence and the competence necessary to effectively self-management their low back condition. Telehealth very effectively supports quota-based exercise plans where patients can be given progressively difficult online exercise programs to reduce symptoms and achieve desired outcomes. Because web-based telehealth can be used monitor a patient’s progress at a distance and facilitate more immediate feedback, the therapist can respond appropriately and more immediately address any exhibited fear-avoidance behavior.

Goal Setting & Participation

Goal setting is a means by which provider can fully engage their patients and have them actively participate, measure progress, and improve the effectiveness of an active plan of care (Baker 2001). The Guide to Physical Therapist Practice recommends therapists should identify the patient's goals and objectives during the initial examination in order to maximize outcomes. A research study looked at the perceptions physical therapists and patients have of goal setting. Therapists stated they believed it is important to include patients in goal-setting activities and that outcomes will be improved if patients participate in the activity. Patients also indicated goal setting and participation is important. Goal setting in the clinical practice is a critical component of the care delivery process as it drives patient participation and adherence to practice guidelines (Baker 2001).

In a multitude of ways, telehealth applications provide the support necessary for patients to better participate. Given the opportunity, today's patient will collaborate with their healthcare provider to help define their treatment regimes and set meaningful attainable goals. Online collaboration through telehealth leads to more consistent, productive exchanges and gives insight to both parties that is not necessarily available with the traditional "office visit" model (Robert Wood Johnson Foundation 2009).

Promoting Patient Self-Management

"In our country, patients are the most under-utilized resource, and they have the most at stake. They want to be involved and they can be involved. Their participation will lead to better medical outcomes at lower costs with dramatically higher patient/customer satisfaction." Charles Safran, M.D. President American Medical Informatics Association

Patient self-management is an essential element in modern and effective care models for treating chronic conditions, emphasizing the patient's central role in addition to provider/patient collaboration that should be continuous, tailored, and actionable (Sarasohn-Kahn 2009).

Exercises are the most common self-management strategy used in physical therapy and reported in the literature for the treatment of chronic low back pain (CLBP). Research suggests that CLBP patients could better manage their condition if they were given self-management education and self-management support in the form of direct access, review appointments, or follow up telephone calls by their provider (Cooper 2008). Telehealth technology is advancing the way patients consume the therapeutic plans providers can make available online. Paper-based tools and pictures are highly inefficient and do not lend to effective replication and thorough exercise performance which the evidence shows leads to the best long term outcomes for LBP. Web-based telehealth takes patient self-management far beyond exercise plans by including all the components discussed throughout this paper. Communication, monitoring and feedback, education, reminders, evidence-based guidelines, progress tracking, and collaborative goal setting all play a role in patient self-management. They lead to an engaging, empowering healthcare experience that puts the patient in a position where they can effectively self-manage and achieve more successful, cost-effective low back pain outcomes.

Summary

Telehealth is not only here to stay, its prevalence and scope will increase dramatically in the coming years. Why? Because telehealth addresses many of the core problems associated with healthcare today including cost, access, and quality. By eliminating geographic dependencies (i.e. telehealth is as close as a mobile device or computer) and making the healthcare experience more patient-centric, more participatory and cost-effective, low back pain care can flourish. Telehealth best facilitates evidence-based LBP care models that improve outcomes, are less disruptive in terms of diagnostic, pharmaceutical, and surgical interventions, and are more empowering for the patient.

Most importantly, when using web-based telehealth as an integral part of LBP care—all stakeholders win.

Here's how:

1. Patients can have more convenient access to more engaging and cost-effective care.
2. Providers can better meet changing consumer demand, launch new revenue streams by providing innovative healthcare services, and deliver better outcomes.
3. Employers can reduce healthcare costs and provide more valuable healthcare benefits to their employees.
4. Insurers can reduce utilization of expensive interventions that have not shown to be cost-effective and increase member satisfaction.

Appendix

Highlights of Telehealth and Low Back Pain

- LBP affects at least 80% of us some time in our lifetimes and 20-30% of us at any given time which is roughly 33 million individuals. The yearly expenditure for this condition is roughly \$100 billion per year in direct and indirect costs and is growing at about 8% per year.
- The average cost per episode of LBP is \$4,020.
- Back pain is the most frequent cause of workers' compensation claims representing about 25% of all claims and about 33% of compensation costs. It affects over 4.6% of the U.S. workforce.
- Mechanical low back pain is the most common types of low back pain and makes up 97% of all types of low back pain. Non-specific low back conditions, such as lumbar sprain or strain make up greater than 70% of the overall condition caused by acute injury, repetitive trauma, and poor posture during activities. Telehealth solutions are safe and effective for the majority of LBP patients.
- Telehealth can be described as the intersection between health and technology used in innovative ways to make healthcare more conveniently accessible and cost-effective.
- Telehealth solutions have proven to have a significant impact on improving outcomes, raising quality, and lowering costs of care for many conditions. In coronary heart failure patients, there was a 40% reduction in heart failure admissions among telemonitored patients and more than a 50% reduction in costs.
- Spinal stabilization exercises are shown to be better than hands-on care for long term outcomes in patients with LBP. Using evidence-based active care protocols, recurrence rates drop to 30% from 84% and demonstrated greater improvements in pain and disability.
- Early intervention and recovery from acute low back injury by training the deep spinal muscles can take only 2-3 weeks whereas recovery from chronic low back pain can take 6-10 weeks with late or no training.
- The majority of LBP is a problem of posture, strength, and awareness. Telehealth solutions deliver to patients the tools, resources and information, and access to professional guidance needed to effectively self-manage this condition. LBP patients can get better quicker and at lower cost using telehealth solutions vs. relying on traditional care delivery models.
- 98.3% of patients who have used telehealth are satisfied with it.

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