THE MANAGEMENT OF LOW BACK PAIN
IN INCARCERATED ADULT MALES

by

Franklin P. Brown

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STATEMENT BY AUTHOR

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APPROVAL BY MASTERS REPORT DIRECTOR

This has been approved on the date shown below:

_____________________________  _______________________
Dr. Donna McArthur            Date
Clinical Professor College of Nursing
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DEDICATION

This work is dedicated to my wife who has spent countless hours editing, coaching, encouraging and providing the moral support needed when I could not see the light at the end of the tunnel. She has kept me rooted firmly to the task, but allowed me to fly away to my dream.
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ABSTRACT

Low back pain (LBP) is a common and disabling condition estimated to affect 15% of the US population. It represents the second most common cause for visits to a primary care provider and is the most common reason for visits to orthopedic surgeons, neurosurgeons, and occupational medicine physicians. It ranks third among indications for surgery. Most individuals will suffer from LBP at least once in their life, and many will experience more than one episode. The pain may subside and disappear for a period, recurring or reappearing a few months or years later.

Inmate population health care needs mirror those of society in general. LBP is the second most common cause inmates seek medical attention. Since the inmate population is predominantly male, only this gender will be addressed. This project explores and discusses current treatment and recommendation for future guidelines in the management of this prevalent problem.
CHAPTER I

Low back pain (LBP) is truly a non-respecter of persons. LBP is found across ages, genders, and ethnic groups. Numerous definitions exist for low back pain. Nachemson and Bigos (1984) proposed that LBP exists in two forms: acute and chronic. Von Korff (1994) expanded the taxonomy by defining transient back pain, recurrent back pain, chronic back pain, acute back pain, first onset, and flare-up. The study by Kent and Keating (2004) found that primary care clinicians, the first line providers in diagnosing, monitoring, and treating LBP, tend to use the taxonomy of acute and chronic in diagnosing and managing LBP.

Problem Statement

Next to the common cold, LBP is the second most prevalent reason that inmates seek medical attention in a small rural jail (Mohave County Jail Medical Statistics, 2005). Following a low back (LB) injury complaint, inmates often seek medical attention for three commonly sought after remedies from the clinician; prolonged periods of bed rest with release from their work detail, an additional mattress, and narcotics. However, clients examined by the clinician are encouraged to remain active, perhaps at a less physically demanding task, and are encouraged to continue the use of the medium firm mattress that is used in the correctional setting. A more conservative pharmacological protocol assists the patient to achieve comfort and yet remain alert and active.

Purpose

The purpose of this project is to develop a standardized procedure for clinicians to use in the evaluation and management of LBP in incarcerated adult males. In addition, a
low impact, low intensity aerobic conditioning program will be introduced to improve overall muscle tone and prevention of injury and re-injury. Through standardized procedures the inmates will receive defined evaluations using an algorithm and pharmacotherapy that will lead to improved management, and cost effectiveness.

*Background & Significance*

Many problems are associated with LBP. The first of these consists of the cost involved in evaluating, diagnosing and treating this medical condition- not only the cost in health care dollars, but also time lost from work and time spent by clinicians in treatment and prevention. The associated problems of low back pain, missed work, medical cost, and expensive diagnostic imaging, which exist in society in general are also prevalent in the correctional climate. In the incarcerated environment where inmates are prone to experience LBP there appears to be a lack of specific guidelines in evaluating, diagnosing, treating and preventing further injury. A lack of a systematic approach in the management of LBP adds to the escalating cost, through inappropriate testing, repetitive evaluations, and mismanagement of pharmaceuticals. Due to the many variables, the exact economic cost of LBP is difficult to quantify.

*Correctional Environment*

The term “jail” is often used to describe a physical facility that holds detainees, commonly referred to as inmates, for short periods of time while they are being processed through the legal system. Inmates may be in the pre-trial, trial or post-trial phase of the judicial process. Due to the over-crowded conditions at state prisons, some inmates may also be serving short sentences up to 18 months within the jail facility. The National
Commission on Correctional Health Care (NCCHC) guide and direct most jails in managing inmate populations. Part of the responsibility mandated is the physical and medical care of those within its custody, (National Commission on Correctional Health Care Guidelines, 2003). The jail environment, out of necessity, is quite controlled. Inmates are required to awaken at a specific hour and also retire on command at a given time. Their diets are mandated and contain 3,100 to 3,300 Kcal per day per inmate without individual selection or choice. Their physical activities are variably controlled by the physical facility design, and by specific correctional staff. The NCCHC guidelines mandate that the inmates be required to receive a given amount of large muscle exercise outside of their housing unit per week, held in what is referred to as a yard. Yard activities range from stretching and walking to impromptu games of extremely physical basketball and football contributing to episodes of LBP.

The correctional environment presents as a unique atmosphere. Many inmates are remanded to custody from a fairly physically inactive lifestyle. A significant number of offenders have been recently homeless, living on the street or in shelters. Once in custody, they may be assigned to work units that are physically demanding, in a manner to which the inmate may not be accustomed. Most of these jobs require repetitive bending, stooping and lifting of heavy objects, such as mopping floors and loading bundles of laundry into commercial size washing machines and dryers. A large number of the inmates also may be free from the influence of illegal substances, alcohol, and tobacco for the first time in several months or years. This substance withdrawal is often replaced with a renewal and interest in physical fitness and/or physical activity. Inmates
often have long hours of inactivity between work details which they fill with sleeping, social interaction or physical activities. Increased physical activity serves as a deterrent to boredom and to help expend energy generated by confinement and withdrawal. Inmates that know they may be going to or returning to prison often spend many hours a day physically “buffing up” through intense workout routines to prevent being considered weak and susceptible to physical assaults. Many of the work-out routines are often of a high-risk nature for injury, such as performing push-ups with another inmate sitting or lying across their shoulders or lower back, and performing inverted sit-ups while hanging by their ankles from upper tier guardrails.

*Housing.* The housing environment can contribute to the occurrence of low back pain. With limited space, bunk beds are a necessity and many of the inmates are unaccustomed to having to climb or crawl, this often is awkward, especially for the aged and obese. Most housing areas have limited seating arrangements with two or three round tables and connected stools that offer no back support. Inmates often sit on steps or lie on the floor within the common area. To maximize available space, many jail facilities construct housing units of two or more tiers, requiring inmates to climb numerous steep stairs when moving from cells to common areas. With the recent explosion in development of the rural and urban areas of Arizona, many small correctional facilities have become dramatically overcrowded. When overcrowding takes place, jails are left with inadequate sleeping arrangements requiring the overflow inmate population to sleep on concrete floors sometimes without a mattress or pillow. The climbing of stairs, concrete floors and limited seating takes its toll on the aged, obese and
those who have been relatively physically inactive. (M. Mastakas, M.D., personal communication, January 25, 2005)

**Definitions for Project**

**Jail.** As already stated, the term jail refers to a physical facility that temporarily houses inmates that are working their way through the judicial system. Jails vary in size and structure; and house anywhere from 5 to 10,000 inmates at a single time. They are often owned and operated by a municipality. However, jails are also owned and operated by the military and federal government. In large urban areas, a jail may have multiple sites with numerous physical facilities within the same system that serve various populations. For the purpose of this project, the term “jail” will refer to a single entity owned and operated by a county municipality.

**Inmate.** Refers to an adult male that is being held within the confines of a jail. The majority of the inmates incarcerated today in the nation’s jails are predominately male, both men and women are often held in the same facility. Female inmates are a rapidly expanding population that present special health care issues during incarceration. Most jails are struggling to provide adequate health care for their female inmates. Though they too suffer from LBP, acute episodes for incarcerated females are less frequent.

**LBP.** Indicates an episode of low back pain lasting for more than 24 hours, preceded and followed by a period of at least one month without low back pain (de Vet et al., 2002). This will exclude chronic LBP in which the client may have had a predisposing condition such as arthritis, sciatica, nerve root compression, or degenerative
disc disease. It will include a new flare up of previously controlled or relieved acute condition.

**Clinician.** In the correctional setting, clinician refers to a physician, nurse practitioner, or physician assistant. For the purpose of this project, clinician will refer to either a physician or nurse practitioner. Physician assistants have been excluded because they are restricted from independent practice separate from their physician supervisor. Clinicians are typically the first line providers of health care to inmates, who then may refer the inmate to specialists, dependent upon necessity of care.

**Correctional Staff.** This is the professional manpower that operates and maintains the jail. Most often, the correctional staffs are employees of the municipality and work under a paramilitary hierarchy similar to the military with captains, lieutenants, sergeants, and corporals. Their main function is to provide care, protection, and custody of the inmates while they are incarcerated. They control the environment, inmate movement and to a large degree the function of the facility.

**Health care.** Prior to the 1970s, health care in correctional settings was largely non-existent. Because of lawsuits initiated often by inmates or in their behalf (Newman v. Alabama), correctional health care today is on par with care provided to the general population, rivaling that of most HMO’s. In this project, health care refers to the care provided by all the medical staff, including physicians, nurse practitioners, psychiatrists, nurses, dentists, mental health workers, and social workers.
Summary

LBP is a universal health problem most often defined by clinicians as acute or chronic. The correctional environment often leads to the occurrence of LBP. In the present correctional setting there appears to be a problem in diagnosing, evaluating and treating LBP. The lack of specific guidelines results in monetary loses and increased time spent managing and treating LBP. Through implementation of improved guidelines, lower level providers at a cost savings to the system may initiate treatment. Many of the associated problems of LBP in the correctional setting may be reduced or even prevented by implementation of the conditioning program. Standardization of treatment will discourage overuse of the medical system for secondary gain, again providing a cost savings to both the medical department and the institution.
Chapter II

This chapter will present a theoretical basis and a review of literature related to the prevalence, ethnicity and gender dominance of low back pain. In addition this chapter will explore the differences between non-organic and organic pain and examine changes in treatment modalities as it relates to low back pain.

Theoretical Framework.

The theoretical underpinnings for this project are based upon a pathophysiological response to injury. The vertebral column is held in place by numerous layers of striated and unstriated muscles, ligaments, tendons and fascia. In the absence of a disease process the spinal column has a range of motion between 75 to 90 degree of flexion, 30 degrees of hyperextension and lateral bending to 35 degrees bilaterally (Seidel, Ball, Dains & Benedict, 2003). Injury to any one of the multiple muscular levels, bony vertebral processes or nervation will result in the loss of range of motion and development of pain.

Tissue injury occurs in the muscle, ligament, tendon or fascia and may result in any multitude of acute or predisposing factors. The result is pain, tenderness, and inflammation manifested by restricted movement and the loss or reduction of function. When this occurs the client/inmate, seeks out medical attention from the clinician. The clinician’s responsibility is to assist in restoring the client to a pre-injury state of health in the most expedient and safe method possible and to assist the client in preventing further injury through education and practical demonstration.
Diagnosis of LBP.

Primary care providers (PCPs) are faced with three distinct problems in treating patients presenting with LBP. First, most patients will have uncomplicated back pain. Therefore, identifying the small group with complicated low back pain is often clinically difficult. Second, PCPs face two populations with low back pain, one that is likely to improve, and a smaller group that is prone to develop chronic low back pain despite the best interventions. And last, the assessment and management of LBP must be made within the context of a time-limited patient visit (Deyo & Phillips, 1996).

Acute Low Back Pain. Acute LBP has been defined as an “episode of low back pain lasting for more than 24 hours, preceded and followed by a period of at least one month without low back pain” (de Vet et al., 2002, p.2409). The epidemiology of injury in LBP is diverse. LBP most commonly results from the straining or pulling of the muscles and ligaments in the lower back that support the vertebral column (Manchikanti, 2000) as opposed to the dislocation of a disc or compression of a vertebrae. Dislocation or degeneration of a lumbar disc leading to nerve root compression and spinal stenosis has long been held as the primary causative factor of LBP. However, Kauppila, Eustace, Kiel, Felson and Wright (1998) indicated that though degenerative disc disease was prevalent in back disease, it was not associated with increased daily back pain. Predisposing causative factors to injury include lifting of heavy objects, improper body mechanics, obesity, repetitive bending, psychosocial events, the physical environment and occupational and recreational participation (Eriksen, Bruusgaard, Knardahl, 2004; Yip, 2004).
Literature Review

Prevalence of LBP. Interesting enough, Picavet and Schuit (2003) found that gender, (males) and age, (between 25-60 years) are related to a higher incidence of LBP, though physical inactivity does not increase the risk. In contrast, Jacob, Baras, Zeev, and Epstein (2004) conducted a community-based study, observing 3350 individuals, finding that different dimensions of physical activity yield different relationships to LBP. High occupational activity demands contributed to increased LBP prevalence, and, conversely, high sporting activity participation contributed to a decline in LBP. Their study also concluded that those who participated in high physical activities also were less likely to smoke and not participate in high occupational activity demands. The relationship to smoking and LBP appears to be one of a healthier lifestyle choice. In this study those who participated in a more active lifestyle also avoided smoking.

Ethnicity of adults with LBP. Few studies have examined patterns of ethnicity in patients with LBP. Several studies explored LBP within a particular ethnic group (Cakmak, Yucel, Ozyalcn, et al., 2004; Yip & Chan, 2001) yet the frequency of occurrence of LBP between ethnic groups has not been thoroughly studied. While LBP appears to be more common in men than women, the difference may be one of occupation coupled with economics. Jobs that are physically demanding and repetitive in nature are often low paying and are often held by men. Harkness, Macfarlane, Nahit, Silman & McBeth (2003) found that new employees who were required to participate in heavy lifting, kneeling, squatting and other predictive causative factors were more likely to experience LBP than more seasoned employees.
Gender related LBP. One study indicated an increase in LBP for women during pregnancy. Ostgaard, Roos-Hansson, & Zetherstrom (1996) found that one in nine women would experience LBP during the course of their pregnancy. The study also concluded that the intensity and frequency of LBP during pregnancy was a reliable predictor of occurrence of LBP following delivery. Outside of the realm of pregnancy, LBP appears to continue to occur more frequently among men. The work of Taylor et al. (2005) concluded that females experiencing LBP were more likely than males to have imaging tests ordered by clinicians, conversely, males were significantly more likely to have surgery recommended to them by clinicians than females.

Non-Organic Pain. Separating acute LBP from symptoms of psychological stress or nonorganic pain in the correctional setting is not always clear-cut. Malingering is a key element in evaluating and diagnosing of LBP. Inmates may feel that they gain special privileges, receive medications, or be issued additional items of comfort through feigning an injury. Due to the magnitude of the problem, several recent studies (Chansirinukor, Maher, Latimer & Hush, 2005; Engers et al. 2005; Pande, Tripathei, Kanoi, 2005) have focused upon the development and evaluation of assessment tools for the diagnosis and management of LBP. Most clinicians, in evaluating LBP within the correctional setting (Prison Health Services Newsletter, 2003), continue to utilize the diagnostic tool developed by Waddell (1980) in making the clinical judgments (Table 1) along with a focused neurological and orthopedic exam. Gaines & Hegmann (1999) found that patients exhibiting any of Waddell’s nonorganic signs had a four times longer period of time for return to unrestricted work and also had greater use of physical therapy
and lumbar tomographic scans resulting in increased cost of care. Waddell’s signs have recently come under question with an increased understanding of neuropathic pain (Centeno, Elkins & Freeman, 2004) often associated with myalgia pain. Others (Takala & Viikari-Juntura, 2000) have questioned the predictive value of functional tests with mixed reviews. Waddell’s signs continue to assist the clinician in determining nonorganic states of pain through simple reliable maneuvers. In the correctional setting where psychosocial stress may be elevated or exaggerated, Waddell’s signs have proven to be an essential diagnostic tool. Numbness, muscle weakness, loss of function and prolonged unrelieved LBP are “red flags” that would prompt the clinician to refer the patient to the service of a specialist for further diagnostic procedures and monitoring. Non-organic pain or malingering is diagnosed when the client is positive for 3 out of the 5 major areas of the Waddell’s signs. Waddell’s signs are easily reproduced and require less than 5 minutes to perform in their entirety.
Table 1

Waddell’s signs

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<td>Tenderness</td>
<td>Superficial: light pinching causing pain = positive</td>
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<tr>
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<td>Nonanatomic: deep tenderness over a wide area = positive</td>
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<tr>
<td>Simulation</td>
<td>Axial loading: downward pressure on the top of the head causing low back pain = positive</td>
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<td>Rotation: examiner holds shoulders and hips in same plane and rotates patient, pain = positive</td>
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<tr>
<td>Distraction</td>
<td>Straight leg raise causes pain when formally tested, but straightening the leg with hip flexed ninety degrees to check Babinski does not.</td>
</tr>
<tr>
<td>Regional</td>
<td>Weakness: multiple muscles not enervated by the same nerve root = positive</td>
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<tr>
<td>Overreaction</td>
<td>Excessive show of emotion = positive</td>
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(Reproduced from Spine, 1980)

Change In Treatment Modalities.

The last two decades have seen a major paradigm shift in the way back pain is understood and treated. Modern treatment favors an approach that is conservative but active, and aims both to restore function quickly and prevent future episodes (Shiple, 1997). In the past, LBP was treated with long periods of immobility, pain was controlled with narcotics, and surgery seemed to be the inevitable end point with about 1% of the
population having surgical interventions. Research now supports a quick return to activity with assistance of a conservative pharmacological plan reserving narcotics for refractory LBP, and a prescribed exercise program that helps restore function and prevents further injury. Staal et al. (2002) performed a literature review of interventions that increased the return of function and resumption of work following a lower back injury. The study results indicated that physical exercise, behavioral modification, and education concerning mechanism of injury and prevention improved the return to work. Kool et al. (2004) further support these findings noting that exercise in a study of factory employees significantly reduced the overall number of sick days utilized by individual employees due to LBP and accelerated the return of the employee to work when LBP did occur.

*Bed rest for LBP.* Traditionally, bed rest was considered a standard of care following a LB injury. Patients were advised to limit their activity and lie flat on their backs for long periods of time. Historically, hospitalization treatments consisted of 48 to 72 hours of bed rest with lumbar traction of varying weights. Extensive bed rest has been found to provide no advantage, and in most cases, actually delays recovery (Malmivaara et al., 1995) in patients with LBP. The study by Deyo, Diehl, & Rosenthal (1986) found patients who were given 2 or more days of bed rest for LBP had longer recovery periods than the control group who were told to continue ordinary activities as much as possible. The control group that remained active required fewer analgesics and returned to work in less time.
Mattress Firmness. Along with bed rest was the commonly held belief that in a LB injury a hard firm surface was best to support the back during periods of rest. Patients were encouraged to place a board or some other hard flat material under their mattresses to increase firmness, while others yet where encouraged to sleep on the floor to relieve symptoms of LBP. In a recent study (Kovacs et al., 2003) the use of a medium firm mattress for the recovery of LBP injuries is supported. The researchers found that by sleeping on a medium firm mattress, patients have less pain while supine and less reported pain upon rising.

Pharmacological Therapies. For decades, narcotics had been used as the mainstay of analgesic treatment for the acute LBP. More recently, several studies have supported the use of Non-Steroid Antiflammatory Drugs (NSAIDs), antispasmodic medications, and muscle relaxants in the treatment of LBP (Cherkin, Wheeler, Barlow, & Deyo, 1998; Griffin, Tudiver & Grant, 2002). NSAIDs have proven efficacy in addition to being cost efficient. Initial drug treatment for acute LBP is ibuprofen in a dosage of 600 to 800mg three times per day or, alternatively, acetaminophen in a dosage of 650 to 1,000mg four times a day during the acute phase of injury. There is no benefit from using the more expensive brand name NSAIDs over the generic. The newer cyclooxygenase-2 (COX-2) inhibitors provide similar results to ibuprofen or acetaminophen in treating acute LBP (Phojolainen, Jekunen, Autio, & Vuorela 2000); however, the cost excludes their use in many restrictive formularies.

Antispasmodic & Muscle Relaxants. During the acute phase of the injury, antispasmodic medications and muscle relaxants have proven to be beneficial. Along
with the ibuprofen or acetaminophen regimen, methocarbamol 500mg three times per day
or cyclobenzaprine 10mg three times per day for 2-4 days can be used. In their
independent study of medications prescribed for low back pain in the primary care
setting, Cherkin, Wheeler, Barlow, and Deyo (1998) discovered that 69% of patients
were prescribed NSAIDs, 35% muscle relaxants, 12 % narcotics and 4% acetaminophen,
29% received no medications. Patients that reported severe symptoms to their clinician
were more likely to receive narcotics or muscle relaxants. In a more recent study
replicating the work of Cherkin and associates Bernstein, Carey, & Garret (2004)
discovered that clients (n=1633) seen by physicians and non-physician providers in a
rural area for acute LBP were more inclined to receive muscle relaxants (64%) by
physicians than (49%) by non-physicians. The study by Chrubasik, Condradt, & Black
(2003) indicated that general clinicians (primary care providers) tended to use more
NSAIDs and COX-2 inhibitors for LBP while specialists (orthopedists) preferred more
“esoteric” and expensive treatments such as nerve blocks and manual and electrical
therapy.

Narcotics. Narcotics have tremendous therapeutic value when used appropriately
and should be reserved for those that are in severe pain or in the patient that may not be
responding to more conservative therapy (Schofferman, 2000). In the correctional
facility the use of narcotics must be done very judiciously. Due to the addictive
behaviors of many of the inmates, narcotics are highly sought after and are frequently
requested on medical visits to the clinician. Medications, in general, and narcotics, in
particular, are often used as a form of jailhouse “currency”. The more potentially
addictive the medication is perceived to be the higher the currency value of the drug. Medications may be traded for extra food from another inmate or to secure the better shower times or other favors. Within the correctional setting all medications are prescribed for a specific time period, when the prescription expires it requires the inmate to return for evaluation before the medication is renewed or continued. Other policies established by the medical staff guide how and when the medications are given to the inmate (Policy & Procedure Manual 2005, Medical Department Mohave County Jail).

Exercise. In 1996, the U.S. Preventive Services Task Force found insufficient evidence to recommend either for or against exercise as a preventative or therapeutic modality for LBP. More recent studies examining the benefits of exercise in prevention and rehabilitation of LBP indicate that exercise is, in fact, of tremendous value. Carpenter & Nelson (1999) found that isolated lumbar extension resistance training significantly improved lumbar muscle strength, endurance and joint mobility, as well as the relief of pain and associated symptoms. Muscle strength and joint mobility are key factors in the prevention of future injuries or reinjuries. The work of Hayden, van Tulder, Malmivaara, & Koes (2005) indicated that “graded-activity” programs, exercise programs that were designed around the workers LB injury, improved absenteeism and prevented further work-place injuries, thus increasing productivity. An additional study by Rok, Wyrtazek & Bilski (2005) examined the outcomes of therapeutic low intensity exercises in low back pain of nurses, concluding that exercise was efficacious, uncomplicated, and provided measurable relief. Shiple (1997), in a literature review of six studies that investigated exercise treatment protocols for the treatment of LBP,
reported that all six studies had positive benefits for treating LBP. Two of the studies reported better results with intensive exercising than normal activity after three to six months on follow-up. The author concluded that exercise logically seemed to be the strategy of choice in the management of all phases of back pain and prevention of exacerbations and reinjury. Though there are numerous studies indicating the benefits of exercise in the prevention and rehabilitation of LBP, no single exercise program has been shown to be more effective than another is. One current randomized controlled study by Sherman, Cherkin, Erro, Miglioretti and Deyo (2005) compared yoga to exercising, and self-care treatment. They concluded that yoga was slightly more beneficial than exercise, which was more beneficial than self-care treatment. Length of exercise programs varied from six weeks to six months. One barrier faced by clinicians in recommending patient participation in exercise programs in LBP is the fear that by doing so the patient may have increased pain and incur additional injuries (Rainville, Carlson & Polatin, 2000).

*Educational Information.* Nordin (1995) claimed that when patients with nonspecific low back pain were given information concerning injury mechanism, such as detailed steps to recovery and pharmacology use by their primary care provider, they were found to be more satisfied at the first visit and required less health care over the course of the injury. Roberts et al. (2002) demonstrated that written advice specific to the LB injury and management of their condition given to patients was a contributing factor in changing behaviors that improved the management of acute back pain. Patients that had received information from their primary care provider perceived themselves as more able to control their low back pain. Furthermore, they reported lower levels of anxiety
and higher levels of satisfaction on the way their back pain was being managed. Additionally, Mendez and Gomez-Conesa (2001) findings support the theory that programs involving practical demonstration and motivational strategies had significantly greater outcomes compared with programs that transmitted information only in the treatment of LBP. The study used a two group experimental design: the control group, where an independent instructor provided information concerning prevention and management of LB injuries. The experimental group received the same information but was additionally instructed and provided with practical demonstrations that involved the group members, which also was lead by an independent instructor.

Research on Incarcerated Men. In a MEDLINE search for studies on incarcerated males the bulk of the information is found within three concentrated areas; mental health issues, communicable disease with diagnosis and treatment, and legal issues as they relate to the health care of inmates. One study by Cropsey, Villalobos & St. Clair (2005) did establish that about half of all inmates meet the DSM-IV criteria for dependence on drug and/or alcohol at the time of their arrest and required substance use treatment or detoxification. McNiel, Binder & Robinson (2005) estimated that 18% of inmates arrested had a mental disorder and that 16% of those arrested were homeless. Seventy-eight percent of the homeless inmates with a mental disorder also had co-occurring substance abuse related disorder. As of mid-year 2004, 713,990 individuals were held in the nation’s local jails (Bureau of Justice Statistics, 2004) or 243 per 100,000 U.S. residents. Therefore, there appears to be a gap in the literature related to the management
of LBP in incarcerated men opening an area of continued research as of yet remains grossly untapped.

*Current Practice Protocols.* Current practice therapy for the treatment of LBP in Mohave County Jail relies upon a standardized clinician protocol (Table 2). Standardized protocols have been established to create the uniformity and documentation of care. Presently in Mohave County Jail, educational literature is limited and underutilized. Additionally, the medical staff does not provide practical demonstrations concerning prevention and rehabilitation for LBP. Thus, inmates are seen numerous times for the same complaint or re-occurring injury. A preventative injury program at this time does not exist. Clinicians are often found trapped because of limited options into giving medications that include narcotics for long periods of time. Many inmates continue to experience injury and reinjury with lack of information or a preventative treatment program.
Table 2

MOHAVE COUNTY JAIL
TREATMENT PROTOCOL

Backache

S: Ask the patient and document the following:
1. What caused the pain (i.e., lifting, fall, old injury)?
2. How long has the pain been present?
3. Describe location and pattern of pain, does it radiate? Any numbness? What worsens the pain?
4. How severe is the pain? What makes it worse?
5. What color is your urine?
6. Presence of fever, chills, night sweats, dysuria?
7. Allergies?

O: Examine the Patient

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1. Note appearance, distress or pain with movement, any gait disturbance?
2. Observe change from sitting to standing, difficulty bending?
3. Inspect local area for swelling, redness, bruises, tenderness to touch, limitation in movement
4. Is urine cloudy, red, dark yellow?
5. Assess lung sounds; are lower lobes congested, wheezing?

A:

P: Refer: If difficulty walking, numbness, severe pain or accompanied by abdominal pain or dark bloody urine, loss of normal ROM, swelling, foot drop, discolorization or if no relief after 48 hour treatment of protocol.
1. Tylenol 650mg PO BID, or Motrin 400mg PO BID x 3 days
2. Percogesic 2 tabs PO BID x 3 days
3. If indicated, bed rest x 24 hrs. 48hrs
4. Ice pack to area x 24 hrs if injured

Patient Teaching
1. Avoid weight lifting, push-ups, etc.
2. Proper body mechanics
3. Back exercises
4. Hot showers
5. Safety measures, lifting with legs
6. Return to clinic if symptoms persist or worsen
7. Acknowledges understanding of specific taught.

(Mohave County Jail, 2005)
Summary

Primary Care Providers continue to be the first line providers in diagnosing and treating acute LBP which, has been defined as an “episode of low back pain lasting for more than 24 hours, preceded and followed by a period of at least one month without low back pain” (de Vet et al., 2002, p.2409). Though more prevalent in males between the ages of 25-60, LBP is found in men and women of all ages and ethnic groups. LBP is not associated with inactivity; however, participation in levels of high activity does diminish the occurrence.

Making the diagnosis of LBP in the correctional setting is often difficult due to the effects of malingering by the inmates. Waddell’s signs, though controversial, continue to prove useful value in the correctional environment in separating the non-organic pain from the true LBP. The last two decades have seen a major paradigm shift in the treatment of LBP. In the past, LBP was treated with bed rest on a firm surface and often patients were encouraged to sleep on the floor for relief. Some patients with LBP were treated in hospital using lumbar traction with varying amounts of weight. Narcotics and complete physical rest rounded out the treatment of the past. Today research indicates that patients, who remain active though participation in a moderate exercise program, use a medium firm mattress and are treated conservatively with NSAIDs’ and muscle relaxants, recovery quicker, return to work sooner and use fewer analgesics. Clients appear to be more satisfied and motivated with their care when their PCP provide them with written information and practical useful demonstrations. Research information
concerning LBP in incarcerated male adults appears to be almost non-existent, leaving many clinicians in the correctional setting to practice with outdated clinical modules.
CHAPTER III

This chapter will describe the development and implementation of the interventions. The diagnostic algorithm, medication guidelines, and preventive exercise leaflet will be discussed and explored in relationship to inmate healthcare. Finally, a conditioning program developed for use within the correctional setting utilizing two different DVDs will be introduced.

Intervention

The purpose of the proposed changes to the LBP guidelines is to improve care and prevent further injuries through proper management, education and introduction to a preventative/rehabilitation exercise program that will assist the inmates in conditioning and strengthening muscle tone. These outcomes will result in cost savings to both the medical department and facility. Four interventions were developed. The first intervention, the introduction of an algorithm, will assist the clinician in making clinical judgments related to LBP. The second will be aimed at utilization of medications that have proved to be both therapeutic and cost effective. The development and use of an educational leaflet on low impact exercises will be provided to the inmates along with practical demonstrations by the medical staff to improve recovery and prevent further injury. Last a facility wide conditioning program through use of videos that will be broadcast over the television system at scheduled intervals throughout the day for the inmate’s use. The interventions can be easily disseminated to other institutions, which may have larger, or smaller inmate populations. Though the majority of inmates confined today are men, the number of women incarcerated each year continues to grow. The interventions outlined apply to either gender, and include adults of all ages.
There are four essential groups of participants in this program that must recognize the value of changing the current LBP guidelines. First, clinicians must recognize that the program will improve care, reduce patient load, minimize paper work and hopefully improve client satisfaction. Second, the medical staff also must recognize that the program will improve care, reduce patient load, minimize paper work, improve client satisfaction and understand their role in educating and demonstrating to the client varying elements of the program. Third, the correctional staff must recognize the benefits of the program making their respective jobs easier to perform. For correctional staff the results would be fewer movements of the inmates transporting them back and forth to the medical department, reduction in the number of high-risk activities that often lead to LBP injuries, and overall improved security though additional organized inmate activity. The medical staff will recognize the benefit of change from the reduction in the number of inmates seen for LBP, decreased amounts of medication used, and fewer inmates on narcotics. The last group is the inmates themselves. A few of the benefits they will receive include an additional scheduled exercise program that will hopefully, improved muscle tone and overall conditioning giving the added benefit of improved health as well as decreased visits to the medical department. Since most correctional facilities today now charge the inmates for visits to the medical department, fewer visits result in fewer charges to the inmates.
Diagnostic Algorithm

When the inmate first appears for evaluation of LBP the clinician will place a copy of the diagnostic algorithm (Table 3) in the client’s medical chart with the inmate’s name and date of evaluation along with the clinician’s detailed history and physical assessment. On each subsequent follow-up visit the clinician can update clinical notes, and refer to the algorithm for treatment progression. The diagnostic algorithm guides clinical practice, but does not replace clinical judgment. Clients that present with questionable symptomology require a detailed history and physical including a careful neurological exam.

Medication Guidelines

Pharmaceuticals for the relief of symptoms continue to play an essential role in the relief of pain and recovery from LBP. The following is a standardized protocol (Table 4) that has been developed from literature research and practice expertise for the use of medications that have proven to be therapeutic and cost effective. Clinicians often feel trapped by demanding and manipulative clients into giving a wide range of medications, often ones that have little therapeutic value or are specialized drugs such as antidepressants or benzodiazapines. Upon first evaluation for LBP a copy of the medication guidelines will be placed in the inmates’ medical chart, along with the clinician’s prescriptive order. Due to the specific population consideration must be given to the inmate with impaired liver and/or kidney function, before implementing pharmacological therapy.
Table 3

Diagnostic Algorithm for Clinicians
Initial Visit for LBP

- Adults with low back problems and no underlying serious condition
  - Provide reassurance & education about back problems
  - Does patient require help relieving symptoms?
    - Yes
      - Recommend/ prescribe comfort options based on risk/benefits and patient preference (see medication table)
    - No
      - Follow-up Visit
        - Change in symptoms?
          - Yes
            - Review history and physical findings (Waddell’s Sign)
          - No
            - Provide reassurance that recovery is expected. Recommended activities to avoid debilitation and reduce risk of recurrence (morning stretch program). Support return to work or required daily activities. Can begin muscle-conditioning exercises after a few weeks
              - Has reasonable activity tolerance returned within 4 weeks?
                - Yes
                  - Return to Normal Activity
                - No
                  - ANY RED FLAGS? (Numbness, Weakness, Loss of sphincter control)
                    - Yes
                      - Additional diagnostic testing. Consider referral if condition warrants.
                    - No
                      - Return to Normal Activity
Table 4  Medication Guidelines

<table>
<thead>
<tr>
<th>Symptom Control Methods</th>
<th>Recommended</th>
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<tbody>
<tr>
<td><strong>Nonprescription analgesics</strong></td>
<td></td>
</tr>
<tr>
<td>Acetaminophen (safest) (no inflammatory properties) NSAIDs</td>
<td>* Tylenol 650mg PO QID x 3 days or Motrin 600mg PO TID x 3 days. Exercise Leaflet to strengthen and tone muscles.</td>
</tr>
</tbody>
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<table>
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<tr>
<th>Prescribed pharmaceutical methods</th>
<th>Prescribed physical methods</th>
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<tbody>
<tr>
<td><strong>Muscle Relaxants</strong></td>
<td></td>
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<tr>
<td>Cyclobenzaprine 10mg PO TID x 3 days, or Methocarbamol 500mg PO TID x 3 days.</td>
<td></td>
</tr>
<tr>
<td>Other NSAIDs or Other Muscle Relaxants</td>
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</tbody>
</table>

**Options**

**Opioids (Reserved for pain unresponsive to NSAIDs and Muscle Relaxants)**

*Tylenol # 3 1-2 tabs PO TID x 3 days, or Propoxyphene/APAP 100/650mg PO TID x3 days, or Hydrocodone/APAP 10/650mg PO TID x3 days |

Consider further diagnostics; refer for any “red flags”

*Inmates that may have impaired liver function due to Hepatitis B or C, or impaired renal function will require reduced medication dose and/or frequency and may require more intense medication monitoring through evaluation of liver and kidney function.

**Preventative Exercise Leaflet**

The development of a LBP handout (Illustration 1) will assist in the recovery and prevention of further LB injuries. Inmates can perform most of the recommended exercises in the common room of their housing unit. Though space is limited, the exercises are concise and do not require the inmate to have additional equipment in order to fully participate in their recovery. Upon their initial evaluation for LBP, the inmate
will be given the preventative exercise leaflet and the clinician, along with the medical staff, will discuss and demonstrate the exercises for that particular inmate.

Illustration 1

Low Back Pain Exercise Guide

Regular exercises to restore the strength of your back and a gradual return to everyday activities are important for your full recovery. The medical staff recommends that you exercise 10 to 30 minutes a day one to three times a day for one week during your early recovery. They may suggest some of the following exercises

**Heel Slides** - Lie on your back. Slowly bend and straighten knee. Repeat 10 times.

**Ankle Pumps** - Lie on your back. Move ankles up and down. Repeat 10 times.

**Abdominal Contraction** - Lie on your back with knees bent and hands resting below ribs. Tighten abdominal muscles to squeeze ribs down toward back. Be sure not to hold breath. Hold 5 seconds. Relax. Repeat 10 times.
**Wall Squats** - Stand with back leaning against wall. Walk feet 12 inches in front of body. Keep abdominal muscles tight while slowly bending both knees 45 degrees. Hold 5 seconds. Slowly return to upright position. Repeat 10 times.

**Heel Raises** - Stand with weight even on both feet. Slowly raise heels up and down. Repeat 10 times.

**Straight Leg Raises** - Lie on your back with one leg straight and one knee bent. Tighten abdominal muscles to stabilize low back. Slowly lift leg straight up about 6 to 12 inches and hold 1 to 5 seconds. Lower leg slowly. Repeat 10 times.
**Single Knee to Chest Stretch** - Lie on your back with both knees bent. Hold thigh behind knee and bring one knee up to chest. Hold 20 seconds. Relax. Repeat 5 times on each side.

**Hamstring Stretch** - Lie on your back with legs bent. Hold one thigh behind knee. Slowly straighten knee until a stretch is felt in back of thigh. Hold 20 seconds. Relax. Repeat 5 times on each side.

**Hip Flexor Stretch** - Lie on your back near edge of bed, holding knees to chest. Slowly lower one leg down, keeping knee bent, until a stretch is felt across top of the hip/thigh. Hold 20 seconds. Relax. Repeat 5 times on each side.

**Piriformis Stretch** - Lie on back with both knees bent. Cross one leg on top of the other. Pull opposite knee to chest until a stretch is felt in the buttock/hip area. Hold 20 seconds. Relax. Repeat 5 times each side.

Conditioning Program

As previously discussed, the jail environment presents a unique atmosphere. All of the televisions within the housing units are connected via a central cable system. Programming is controlled through one central unit. To show a program to the entire population, the video must be loaded via the central programming video unit resulting in the same program being shown in all of the housing units. Each morning, and periodically scheduled throughout the day, workout videos (see Illustration 2) can be played facility wide to encourage stretching, conditioning and proper body mechanics to help prevent LBP.

The following two DVD’s are good examples of low impact exercise routines that can be performed with minimal pre-conditioning, do not require additional equipment, can be completed within a very limited space, and afford the ability to be broken up into multiple workouts. In addition, the DVDs feature low impact aerobic exercises that emphasize slow, fluid movements designed to build overall strength, improve muscle tone and bring inner peace.

Illustration 2
Conditioning DVD.
CHAPTER IV

The purpose of this chapter is to outline how the interventions will be implemented into the routine of the jail facility. It also examines how the interventions will be evaluated, in addition to examining the strengths and limitations to the project. And finally what is the significance of the project to nursing and to the organizations to which the project will effect.

First, the occurrence of LBP continues to represent a significant burden on health care and society, not only in the monetary expenditure, but also the loss of productivity in the work place, in addition to the time clinicians spend in evaluating and re-evaluating the patient. Second, the correctional setting is quite unique. Clinicians face many challenges in evaluating, diagnosing, and managing LBP in a population that may have alternative motives. The opportunity of this project is multifaceted. The purpose is to revise and improve a systematic method of evaluating and treating LBP, in addition to instituting new programs that will improve the rehabilitation of LBP as well as prevent the initial occurrence though a simple conditioning program.

Implementation of the Plan

Implementation of the plan begins with clearance by the facility commander. The commander must have a firm understanding of the project with its benefits and possible risks. Key features to be highlighted are the benefits to the inmates and correctional staff in addition to the cost savings for the facility. The commander must assign time slots as to when the video will be played throughout the day. Once the time slots are determined then the central video unit can be pre-programmed for those time frames. Upon
clearance by the facility commander, the next step toward implementation will be the integration of the plan into the medical department. This can be accomplished in two steps. First, to in-service the clinicians with appropriate question and answer sessions, followed by in-servicing the rest of the medical staff, again with appropriate time for questions and answers. The Preventative Exercise Leaflet, Diagnostic Algorithm, and Medication Guidelines need to be refined and printed ready for distribution and inclusion into the inmates’ medical charts. Once the medical staff has developed an understanding of the interventions, the next step into complete implementation is the introduction of the concept to the correctional staff. This requires multiple in-servicing sessions to cover staggered shift rotations. Included in all in-service meetings will be handouts of all printed materials and a short presentation of the videos used for the conditioning program. Again, once all questions have been answered and there appears to be a firm understanding of the interventions, the project can begin to be presented to the inmates. Inmates currently being treated under the old guidelines will not experience a change in medication. Upon the next follow-up visit, established patients with LBP will be provided with the Preventative Exercise Leaflet and receive appropriate instructions and encouragement by the medical staff to participate in the conditioning program. All new LBP presentations will be treated under the new program after complete implementation.

Evaluation

Given that Mohave County Jail and other similar facilities continue to track health care visits by inmates, statistics are produced annually, if not monthly. For example, in the year 2005 there were approximately 6,000 visits by inmates to the medical
department. Of those 6,000 visits approximately 900 visits or 15% were for the primary
diagnosis of LBP or associated related problems (Mohave County Jail Medical Statistics
2005). One method and perhaps the most reliable evaluation tool to determine the
effectiveness for the proposed project would be indicated by a reduction in the number of
health care visits to the medical department for LBP and related problems. If the
clinician sticks strictly to the proposed formulary for LBP there would also be a reduction
in the number of medications used, representing an additional cost savings to the facility.
Since the correctional setting is controlled by extrinsic influences unrelated to the
medical department, a change in the attitude and behaviors of the correctional staff may
also reduce the number of LBP related injuries, for example restricting high-risk
activities of the inmates. Inmates continually seek to have a voice heard concerning their
opinion. A simple questionnaire determining participation in the conditioning program
and self-report of program overall muscle tone and conditioning could be used. Most
inmates cycle through the jail’s legal system every 3-4 months, therefore, the
questionnaire could be randomly issued quarterly. Based upon results measured by
reduction in the number of visits to the medical department, decreased medication use
and satisfaction recorded through the questionnaire the intervention would need to be
evaluated annually to determine overall effectiveness.

Perceived Strengths of Project

One of the key strengths of the project is the ability to apply it with minimal
disturbance to the established routine either to the inmates or to the correctional staff.
The inmates do not have to get up earlier or require special transportation in order to
participate. Likewise, the correctional staff will not require additional manpower or involve more paper work to oversee the project. Another strength is that the project does not require additional equipment, with the exception of providing educational literature. The preventative exercises in the leaflet are easily understood and can be demonstrated by the nursing staff with minimal time expenditure. Mohave County Jail houses approximately 500 inmates and is considered a medium-small facility. The intervention has the ability to be adaptable to larger and smaller size facilities and have the same beneficial results. Though most of the inmates today are males, the project can easily be adapted to the growing female population that is incarcerated. And finally, the changes in behaviors that can be obtained through improved physical conditioning will have a lasting positive effect on the health of these men and women which ultimately impacts quality of life and economic productivity.

Perceived Limitations of Project

A major barrier to implementing this intervention is accepting change, by the clinicians, medical staff, correctional staff, and the inmates. Changing the mindset to prevention instead of treatment after the injury may be difficult. The positive benefits of the project must constantly be reinforced to the inmates, clinicians, medical staff and correctional staff. Instead of high-risk exercises that occur injury, exercises that condition, tone and improve mobility with the benefit of weight loss and joint flexion. The intervention may not be readily applicable to practice outside of the correctional setting. The intervention was designed around an environment that by nature can be manipulated yet controlled. In the research, exercise programs that had proven benefits
were all attached to an institution or a specific facility that addressed a limited population. The vast majority of research and exploring LBP, injuries and benefits of exercise were performed in the European community. It appears that America continues to treat injuries and use pharmacological therapies instead of investing into prevention.

**Significance for Nurse Practitioners**

Nurse practitioners who practice within the correctional setting have the ability to make major life altering changes in their clients who find themselves within the confines of the judicial system. Nurse practitioners, because of their education and training, are uniquely qualified to make clinical decisions based upon the presenting elements of the disease process. They have the ability to systematically assimilate information provided by the client, perform in-depth physical examinations and then create a plan of care in cooperation with the client that will restore the client to a state of improved health.

LBP continues to be a dramatic health disparity both within and outside of the correctional setting, costing society millions of dollars in health care expenditure each year (Williams, Feuerstein, Durbin, Pezzullo 1998). Nurse practitioners can inform and educate their clients as to causation and steps to prevention of the injury. Through their clinical skills nurse practitioners can then institute appropriate management techniques, whether it is medication administration or modalities that will improve muscle tone and strength. In the advanced clinical role, nurse practitioners would also refer those clients who present with known red flags symptoms, in addition to the client that may not be responding to therapy, to specialists.
Through on-going research and keeping abreast of developing therapies nurse practitioners can remain prepared to best intervene in behalf of their clients. Working collegially with the medical and correctional staff, the nurse practitioner can play a key role in changing of behaviors and lifestyles that will not only improve the health of the client, but also the community at large.

The significance of the project may not be quite so evident in the targeted population. While there will be a reduction in the number of injuries, resulting in the decrease number of visits to the medical department, reducing the amount of medication used. The benefits to the inmates may be more subtle. Over a period of time if the inmates participate in the exercise program they will experience improved health benefits of weight control, improved mobility, flexibility and improved cardiovascular conditioning.
REFERENCES


