

Chronic Low Back Pain: A Spine Surgeon's Graveyard

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Abstract

Background: Chronic low back pain (cLBP) is a prevalent and debilitating condition. The World Health Organisation identified it as a major global health concern with the incidence rising by 50% between 1989 and 2019. It is projected that about 843 million people globally will suffer from cLBP by 2050. Despite its prevalence, the pathogenesis of cLBP remains poorly understood and its treatment fragmented. Almost 70% of cases are categorized as non-specific where the pain could likely be arising from dysfunction in ligament, muscles or joints. Degenerative conditions amount to 27% of cases, while non-spinal and sinister causes contribute to a smaller percentage. Psychosocial factors also play a significant role in both the onset and persistence of cLBP.

Discussion: The management of cLBP is multifaceted, focussing on non-surgical interventions such as pharmacological treatment, physical therapy, lifestyle modifications and complementary therapies. While non-steroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants provide symptomatic relief, physical and behavioural therapies are crucial in addressing the chronic nature of the condition. Surgical options are reserved for cases with specific patho-anatomic aetiologies such as spondylolisthesis or spinal stenosis. The management of psychosocial aspects through cognitive behavioural therapy (CBT) is pertinent in enhancing patient outcomes.

Conclusion: This article provides a comprehensive review of cLBP, encompassing its aetiology, natural history, evaluation and management strategies. The role of multi-disciplinary approach, patient education and lifestyle modification is important in treating this complex condition. By integrating evidence-based practices with individualized care, the clinician can improve quality of life of patients affected by cLBP.

Keywords: Chronic low back pain, Non-specific low back pain, Degenerative lumbar spine, Cognitive behavioural therapy, Ergonomics.

Introduction

Chronic low back pain (cLBP) is defined as non-radiating pain between the lower edge of the ribs and the buttock persisting for more than 3 months [1]. Korf has defined cLBP as back pain that is present for at least half the days within 12 months, in single or multiple episodes. This is as opposed to recurrent LBP where the pain occurs in multiple episodes and lasts for <half the days within a 12 month period [2].

The World Health Organization has identified LBP to be a leading cause of disability globally, amounting to 1 in 13 people affected in 2020. The global incidence of cLBP has increased by

50% from 1989 to 2019 and it is estimated that 843 million people will be suffering from cLBP by 2050 [3]. The prevalence of cLBP is 4.2% between 24 and 39 years, 19.6% between 40 and 59 years, and 25.4% in those >60 years of age. cLBP is 50% more common in women than in men [4].

Absenteeism from work due to LBP has increased 40-fold over the last 30 years with 30% of sick leaves lasting longer than 6 months [5]. It has been observed that only 50%, 30%, and 5% of patients return to work, after having been off work because of cLBP for 6 months, 1 year, and 2 years, respectively [6]. Globally, the cost of cLBP is estimated to be 12.2–100 billion dollars per year arising from treatment costs, absenteeism from work, prolonged loss of function, and disability payments [7].

This article aims to provide a comprehensive review of all aspects relating to cLBP with an overview of international recommendations, non-surgical management, and surgical strategies.

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Submitted Date: 25 Jul 2024, Review Date: 02 Aug 2024, Accepted Date: 12 Sep 2024 & Published Date: 10 Dec 2024

Journal of Clinical Orthopaedics | Available on www.jcorth.com | DOI: <https://doi.org/10.13107/jcorth.2024.v09i02.654>

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Table 1: Etiology of cLBP [8]		
Category	Percentage	Etiological factors
Non-specific	70	Poor bone health, muscle weakness, joint stiffness, ligament, and muscle injuries
Degenerative conditions	27	Disc and facet joint degeneration, spinal stenosis, spondylolisthesis, and scoliosis
Non-spinal causes	2	Ureteric/gallbladder stones, pelvic inflammatory disease, gastritis, and pancreatitis
Sinister causes	1	Infections, tumors, inflammatory arthritis, connective tissue disorders, and Paget's disease
Functional overlay	N/A	Psychosocial issues

cLBP: Chronic low back pain

spine that may result in disc herniation, lumbar canal stenosis, degenerative spondylolisthesis, and scoliosis, all of which result in LBP, sciatica, progressive loss of function, and independence. Concomitant changes include weakening of the axial musculature and shifting of the body's axial loading posteriorly.

Psychosocial factors

Psychosocial factors often play a role in the genesis and persistence of LBP. These

Etiology

About 70% of cLBP is labeled non-specific and probably arises from dysfunction of ligaments, weak and poorly conditioned muscles, and stiff joints. Weak bones due to osteoporosis and osteomalacia can also result in poorly localized, non-specific back pain. Poor posture, unhealthy diet, lack of exercise, and repetitive work stress play a major role in the genesis of non-specific cLBP. Approximately 27% of cLBP arises from the degenerative affliction of the lumbar disc, facet joints, and vertebrae. It is estimated that 2% of cLBP is non-spinal in origin and only 1% of patients with cLBP suffer from more sinister conditions including infections, tumors, inflammatory arthritis, connective tissue disorders, Paget's disease, etc. (Table 1) [8]. Psychosocial issues have been found to play a huge role in the genesis of cLBP. The pathogenesis of cLBP is poorly understood.

Muscle strain

Lumbo-sacral ligament sprain or muscle strain is a common cause of acute LBP. The acute component of muscle strain is considered to be a protective spasm. However, repetitive firing of the muscle end-plate action potential causes a fatigue element and leads to cLBP.

Degenerative disc disease (DDD)

As outlined by Kirkaldy-Willis, degeneration of the lumbar disc or facet joints sets into motion a cascade of events within the

patients can be divided into three groups: (1) Psychological group which includes anxiety or depression. These patients generally do not suffer from severe pain. (2) Social and socio-occupational group which include social support or compensation issues. (3) Cognitive-behavioral group which includes coping issues, fear avoidance, or maladaptive beliefs such as kinesiophobia and catastrophizing, all of which are related to unfavorable clinical outcomes in patients with LBP [9]. Growing evidence suggests that cLBP causes morphological changes within the central nervous system that are similar to those seen with neurodegenerative disorders which result in cognitive decline and brain fog.

Lifestyle and occupational factors

Smoking, obesity, physical inactivity, alcohol consumption, and disturbed sleep, among many others, have been found to be associated with cLBP [10]. There is no clear explanation with regard to the mechanism by which lifestyle factors lead to cLBP. It is common knowledge that poor ergonomic setup and jobs involving lifting heavy weights are known to cause axial LBP. Poor socioeconomic class, lesser education, heavy manual labor, and sedentary occupations are also risk factors for developing cLBP.

Natural History

cLBP in itself is a symptom complex. Although the pain is

Table 2: Red flag for LBP [5]
First episode of LBP in patients aged <20 years or >55 years
Bilateral sciatica, significant motor or sensory disturbance
Bladder or bowel dysfunction
Gait disturbances, imbalance
Thoracic pain, continuous pain, rest pain, and night cries
Morning stiffness and pain that improves with movement
Fever, weight loss, and anorexia
Recent significant trauma
Past history of Kochs, malignancy, HIV, steroids, inflammatory arthritis, uveitis, and enthesitis
IV drug abuser
Osteoporosis
LBP: Low back pain

Table 3: Yellow flags for functional LBP [5]
Unremitting pain, diffuse pain, hemibody pain, and whole-body pain
Location of pain varies and symptoms expand
Pain present for months without a clear supporting diagnosis
Abnormal behavior – anxiety, depression, irritability, hostility, and social withdrawal
Sleep disturbances, vertigo, migraine, and loss of libido
Difficulty at work, poor job satisfaction, and compensation issues
Lack of family/social support, and overprotective family
Financial issues
A belief that pain and activity are harmful and disabling
A belief that passive treatment rather than active participation is helpful
LBP: Low back pain

Table 4: Wadell's signs for diagnosing functional LBP [11]

Superficial tenderness
Non-anatomic tenderness
Axial loading
Hip rotation
Distraction straight leg raising test
Regional weakness
Regional sensory disturbance
Over-reaction
LBP: Low back pain

persistent, there are likely to be phases of exacerbation (recurrences) which are generally described as flare-ups. A flare-up is defined as a period of more severe pain, usually lasting for less than a week.

Evaluation

The diagnosis of cLBP begins with careful history taking and a thorough clinical examination. In most cases, sinister causes of back pain such as fractures, tumors, infections, and inflammatory arthritis can be ruled out by excluding the red flag signs for LBP on history and examination (Table 2) [5]. In addition, the yellow flag signs for LBP help identify individuals in whom psychosocial factors may play a role in the genesis and persistence of back pain (Table 3) [5]. Gordon Wadell described signs on clinical evaluation that may indicate that the back pain is of functional origin (Table 4) [11]. However, a number of subsequent studies have questioned the validity of Wadell's tests and suggested that they have been inappropriately used by clinicians to prove the absence of physical pathology.

The most common initial test performed in individuals with cLBP is plain radiographs. Although plain radiographs are non-specific for the diagnosis of cLBP and invariably show some features of lumbar spondylosis, they are useful in assessing global sagittal and coronal spinal alignment and identifying spondylolisthesis and spinal fractures. Dynamic X-rays may demonstrate segmental instability. Blood investigations may be acquired in patients suspected to be suffering from infections, tumors, inflammatory arthritis, and osteoporosis.

The second most commonly acquired investigation is a magnetic resonance imaging (MRI) scan. It is an extremely sensitive test that is useful in identifying fractures, infections, and tumors. It also helps to demonstrate pathological degenerative changes such as disc degeneration, herniation, facet joint synovitis and arthritis, and spinal stenosis which must be correlated with the patient's symptoms. However, for degenerative back pain, MRI is too non-specific to differentiate individuals with LBP from those without LBP. 1/3 of all asymptomatic individuals have degenerative changes and all patients >60 years have at least one disc bulge or herniation. In symptomatic patients, MRI findings often do not correlate with the severity of symptoms. Patients with few imaging abnormalities may have more pain and functional limitations

than those with worse imaging changes. In addition, patients may clinically worsen without any change in imaging or may improve despite radiographic progression.

Single photon emission computerized tomography scan (SPECT scan) is a sensitive tool to investigate treatment-resistant cases of cLBP. It highlights the precise location of increased tracer activity, thereby pinpointing the source of pain. A negative test also holds significant value in identifying a psychological basis for pain [12, 13].

In patients with persistent severe pains where a clear diagnosis has not been reached, provocative tests such as discograms, facet joint injections, and root blocks may be performed to identify the pain generator. However, these tests have a high false positive rate and must be interpreted with caution.

In cases where a non-organic cause of cLBP is suspected in isolation or as a cofactor, a psychological assessment is helpful.

Management

Being multifactorial in origin and with no clear pain generator being identified in a large number of patients, the treatment of cLBP is challenging, and often dissatisfying for both the patient and the treating clinician. There is no guarantee that the treatment of the potential causes of cLBP will make the pain go away. Hence, the treatment of cLBP involves educating the patient about the benign nature of their pain and helping them live a better quality of life despite their problem. Besides education, the treatment largely involves physical therapy and behavioral therapy with few medications and no bed rest. This is unlike acute LBP where inflammation plays a major role in the pathogenesis and treatment involves anti-inflammatory medications and a short period of rest.

Non-operative treatment

Pharmacological treatments

Non-steroidal anti-inflammatory drugs (NSAIDs) are recommended as the first-line medication for the pharmacologic treatment of cLBP. This should be employed respecting the rule of 'the lowest effective dose for the shortest possible period' considering the drug toxicity and patient risk factor profile [14]. NSAIDs are deployed mainly to tide over the acute flare-up of cLBP so as to open the door to other conservative treatment options becoming feasible from the patient compliance point of view. With respect to the choice of NSAIDs, the North American Spine Society has reported insufficient evidence to make a recommendation for or against the use of a particular drug [15].

Weak opioids are recommended as a second-line treatment, in association with acetaminophen or not, when NSAIDs are contraindicated, not tolerated, or have failed [14]. A Cochrane review by Chaparro et al. has partially supported the role of opioids for short-term relief in cLBP. However, they concluded

that opioids are not more effective than NSAIDs or antidepressants. Thereby they should be used with caution considering the side-effect profile [15].

Muscle relaxants have been widely used for flare-ups of cLBP. They act by reducing the spasm of muscle which is often a protective mechanism by the body to prevent further harm. A short-duration use of commonly used muscle relaxants such as thiocolchicoside benefits in restoring function. However, there is no benefit in the long-term use of muscle relaxants in cLBP.

Tricyclic antidepressants such as amitriptyline or serotonin-norepinephrine reuptake inhibitors (SNRI) such as duloxetine help by the release of neurotransmitters in the spinal cord. They also help in ameliorating the patient's perception of pain by treating underlying depression and improving sleep. A meta-analysis undertaken to understand its effectiveness found that antidepressants have a beneficial role in reducing the severity of pain. However, they do not influence the functional status of cLBP [16]. Studies have recommended the use of antidepressants in patients suffering from anxiety or depression along with cLBP.

Physical therapy and rehabilitation

Physiotherapy is part of the main-stay in conservative management of cLBP. Rehabilitation techniques are variable in different studies. Paraspinal muscle strengthening programs, spinal stabilization exercises, McKenzie directional exercises, and core strengthening exercises are some of the exercise regimes routinely used by physiotherapists. Massages and mobilization of soft tissues are commonly recommended, but only as part of multimodal treatment with active rehabilitation. Other techniques such as transcutaneous electrical nerve stimulation work by acting on the pain gate pathway but there is no consensus on their role in cLBP.

Lifestyle modifications

Ergonomic awareness and instituting workplace adjustments not only have a role in preventing acute and cLBP but also have contributory benefits for patients to recover from cLBP. Standing desk, chair with supported back, armrests, and good thigh support; feet planted on the ground are some of the simple cost-effective measures that the patient can incorporate into their routine. Many individuals benefit from understanding appropriate manual handling techniques and it should become the responsibility of not only the employee but also the employer that these are instituted as part of the standard operating procedure in their setting.

A person's body weight has a direct relation to the stress on the spinal motion segment and the lumbar facet joint. In a study conducted on the Korean population, weight gain was found to be significantly associated with cLBP. In fact, the greater the amount of weight gain, the stronger the association with an

increased risk of chronic LBP. Thereby weight management should be part of patient education and preventive care. However, clinicians should carefully monitor weight gain in LBP patients to help lower the risk of progression to cLBP.

Complementary and alternative therapies

Yoga, Pilates, or Tai Chi are complementary exercise regimes that have varying degrees of recommendation. Yoga may offer medium-term improvement in both pain as well as function; however, patient selection and motivation are crucial [14]. If yoga has been previously useful for the management of myofascial pain in a patient for up to 2 years, then returning to yoga for cLBP is worthwhile [17].

Alternative therapy modalities such as acupuncture and chiropractic care have been utilized by many patients in managing their cLBP. Acupuncture is based on the stimulation of the central nervous system to release endogenous opioid peptides for the development of an analgesic effect. In a 2013 study, acupuncture has been found to reduce pain intensity and bothersomeness as compared to sham controls in patients with cLBP. Thereby, it may be utilized largely for its symptomatic management of cLBP. There is limited evidence with regard to the role and effectiveness of chiropractic care in the management of cLBP. However, a pilot study of 72 patients undertaken by Haas et al. concluded that chiropractic treatments have a positive and clinically important effect on cLBP with regard to pain intensity and disability at 4 weeks; however, the study was limited by a small sample size [18].

Patient education and self-management strategies

cLBP is a condition where educating the patient about the disease process and natural history is highly beneficial. Techniques such as involving the patient in shared decision-making help in better awareness, motivation, and compliance with treatment [35]. This helps the patient feel oriented to the condition, supported, and heard which is essential considering the social burden of the disease. It also allows treatment to be focused on the needs of the patient. Sharing patient information leaflets or online information website links to content related to cLBP does have an impact on compliance with treatment.

Expression of pain on social platforms such as small groups of individuals or on social media may also be a good self-management strategy. It may be related to the personal burden of the disease or related to the need for validation. A report has noted that when patients do not feel validated, there is a greater disability. Encouraging patients to engage in self-expression is thereby likely to improve satisfaction.

Consultation feeling rushed and patients not feeling validated are important cues that have emerged in a study assessing patient response to LBP. Enhancing clinical communication with minor tweaks in practice such as the use of a mix of open

and closed questions, seeking permission, explaining the rationale for different approaches, or using the person's own narrative and experiences to reflect back are effective tools.

Interventional treatments

Local infiltration of steroids with local anesthetic is commonly used to combat inflammation associated with acute LBP and radicular leg pain. However, in cLBP where the primary pathology does not involve inflammation, facet joint blocks, epidural injections, and intradiscal steroids have little or no role and are not recommended.

Median branch blocks have been used to alleviate facet joint pain. Although they offer reasonable short-term pain relief, they are mainly used to identify painful facet joints that may benefit from radiofrequency ablation (RFA) of the median branch to the facet joint. Care pathways have recommended that RFA should only be considered in lumbago resistant to usual treatments with at least two positive diagnostic facet joint blocks [5]. They provide satisfactory pain relief in selected patients. However, pain often tends to reappear after months or years.

A spinal cord stimulator (SCS) is a device inserted surgically for the treatment of persistent back pain. It modulates pain by sending electrical signals from its electrodes to the spinal cord. Traeger et al. in their systematic review comprising 13 studies and 699 participants found that in the mid to long term, SCS does not improve back pain, leg pain, or health-related quality of life [19].

Platelet-rich plasma (PRP) is an injectable biological product which has a higher concentration of platelets in a small amount of plasma as compared to peripheral blood. The broad tenet for the use of PRP arises from the fact that it has numerous growth factors in platelet granularities which may be helpful in tissue repair, pain relief, and regenerative processes. There is a lack of high-quality clinical research regarding its effectiveness in the management of cLBP but anecdotal references have described a favorable role in the management of acute back pain.

Surgery

Once a patient suffering from cLBP has exhausted all forms of non-operative treatment, surgery can become an option in carefully selected patients. The clinician should make every effort to establish a pathoanatomic etiology with the diagnostic modalities available. Surgical intervention should be approached cautiously and after detailed consultation with the patient to establish realistic goals and expectations.

Indications for surgery include:

- Spondylolisthesis
- Lumbar spinal stenosis
- Facet joint arthropathy with fluid-filled facets and instability
- Degenerative lumbar spinal scoliosis.

Surgery for cLBP secondary to DDD or facet joint arthritis must be avoided as far as possible, because of the inability to identify the pain generator and the significant problem of functional overlay, both of which may compromise outcome. Boos and Webb (1996) reported relief in cLBP in only 50% of 5601 patients undergoing fusion for DDD. About 20% of the patients were no better and 30% reported worse pain without any significant change in disability [20]. The initial success with surgery deteriorates with time presumably due to degeneration at adjacent levels resulting in recurrence of LBP over time.

Surgical options include decompression for simple lumbar canal stenosis without instability and decompression + spinal fusion for complex stenosis associated with instability, spondylolisthesis, and scoliosis. To overcome the problem of adjacent segment degeneration associated with spinal fusion, non-fusion devices such as dynamic stabilization and artificial disc and facet joint replacement have been used but with results similar to fusion in the long term.

Management of psychosocial aspects

Cognitive behavioral therapy (CBT) is a form of psychotherapy that helps in treating anxiety, insomnia, depression, addiction, and other mental disorders. In addition, it has been utilized in the treatment of cLBP [21]. The major goal of CBT is to replace maladaptive patient coping skills, emotions, and behaviors with more adaptive ones. CBT alone does not address all of the important variables potentially contributing to cLBP (e.g., biological factors), but may improve care for patients with psychological comorbidities. It should be administered by licensed mental health professionals.

There is a strong consensus on the beneficial role of CBT in the treatment of patients with cLBP. Coping strategies such as minimizing negative and self-defeating thoughts can lead to a decrease in distress which in turn can lead to a reduction in pain experience. CBT is not a stand-alone treatment. It is most effective when combined with other relevant treatment options described.

Conclusion

cLBP is a symptom of a disease complex. Treatment requires a multi-disciplinary approach. A spine surgeon encounters such patients from early in his career, right up to the last days of practice. The chronicity of the condition causes alterations in the neural architecture, thereby making improvement in symptoms slow and gradual. It is essential that the treating doctor hand-holds the patient through this journey and emphasizes the need to be patient. It becomes equally important to treat the other spinal and non-spinal comorbidities in conjunction. Finally, a focus on improving lifestyle and ergonomic factors would delay the onset of LBP.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of Interest: NIL; **Source of Support:** NIL

References

1. Rozenberg S. Lombalgie chronique, définition et prise en charge [Chronic low back pain: Definition and treatment]. *Rev Prat* 2008;58:265-72. [French]
2. Korff M. Studying the natural history of back pain. *Spine (Phila Pa 1976)* 1994;19:2041S-6.
3. Available from: <https://www.who.int/news/item/07-12-2023-who-releases-guidelines-on-chronic-low-back-pain>
4. Meucci RD, Fassa AG, Faria NM. Prevalence of chronic low back pain: Systematic review. *Rev Saude Publica* 2015;49:1.
5. Bailly F, Trouvin AP, Bercier S, Dadoun S, Deneuille JP, Faguer R, et al. Clinical guidelines and care pathway for management of low back pain with or without radicular pain. *Joint Bone Spine* 2021;88:105227.
6. Chou R. Low back pain (chronic). *BMJ Clin Evid* 2010;2010:1116.
7. Fatoye F, Gebrye T, Ryan CG, Useh U, Mbada C. Global and regional estimates of clinical and economic burden of low back pain in high-income countries: A systematic review and meta-analysis. *Front Public Health* 2023;11:1098100.
8. Shokri P, Zahmatyar M, Falah Tafti M, Fathy M, Rezaei Tolzali M, Ghaffari Jolfayi A, et al. Non-spinal low back pain: Global epidemiology, trends, and risk factors. *Health Sci Rep* 2023;6:e1533.
9. Smuck M, Kao MC, Brar N, Martinez-Ith A, Choi J, Tomkins-Lane CC. Does physical activity influence the relationship between low back pain and obesity? *Spine J* 2014;14:209-16.
10. Yoshimoto T, Ochiai H, Shirasawa T, Nagahama S, Uehara A, Muramatsu J, et al. Clustering of lifestyle factors and its association with low back pain: A cross-sectional study of over 400,000 Japanese adults. *J Pain Res* 2020;13:1411-9.
11. Waddell G, McCulloch JA, Kummel E, Venner RM. Nonorganic physical signs in low-back pain. *Spine (Phila Pa 1976)* 1980;5:117-25.
12. Dolan AL, Ryan PJ, Arden NK, Stratton R, Wedley JR, Hamann W, et al. The value of SPECT scans in identifying back pain likely to benefit from facet joint injection. *Br J Rheumatol* 1996;35:1269-73.
13. Farley T, Stokke J, Goyal K, DeMicco R. Chronic low back pain: History, symptoms, pain mechanisms, and treatment. *Life (Basel)* 2024;14:812.
14. Hall H, McIntosh G, Melles T. A different approach to back pain diagnosis: Identifying a pattern of pain. *Can J Contin Med Educ* 1994;6:31-42.
15. Chaparro L, Furlan AD, Deshpande A, Mailis-Gagnon A, Atlas S, Turk DC. Opioids compared to placebo or other treatments for chronic low-back pain. *Cochrane Database Syst Rev* 2013;2013:CD004959.
16. Lee CA, Jang HD, Moon JE, Han S. The relationship between change of weight and chronic low back pain in population over 50 years of age: A nationwide cross-sectional study. *Int J Environ Res Public Health* 2021;18:3969.
17. Kreiner DS, Matz P, Bono CM, Cho CH, Easa JE, Ghiselli G, et al. Guideline summary review: An evidence-based clinical guideline for the diagnosis and treatment of low back pain. *Spine J* 2020;20:998-1024.
18. Haas M, Group E, Kraemer DF. Dose-response for chiropractic care of chronic low back pain. *Spine J* 2004;4:574-83.
19. Hao Q, Walter M. Platelet-Rich Plasma Injections for Lower Back Pain: CADTH Health Technology Review. Ottawa, ON: Canadian Agency for Drugs and Technologies in Health; 2023.
20. Boos N, Webb JK. Pedicle screw fixation in spinal disorders: A European view. *Eur Spine J* 1997;6:2-18.
21. Hanscom DA, Brox JI, Bunnage R. Defining the role of cognitive behavioral therapy in treating chronic low back pain: An overview. *Global Spine J* 2015;5:496-504.

Conflict of Interest: NIL
Source of Support: NIL

How to Cite this Article

Shah P, Zaveri G. Chronic Low Back Pain: A Spine Surgeon's Graveyard. *Journal of Clinical Orthopaedics* July-December 2024;9(2):29-34.