IN THE NAME OF GOD

# Pharmacologic treatment in Low Back Pain

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**Low back pain is a symptom, not a disease, and has many causes**

**It is extremely common.**

**Approximately 40% of people say they have had low back pain within the past 6 months,**

**Most episodes resolve with or without treatment and the great majority of people who have back pain do not seek medical care.**

**Studies have shown approximately 90% of people who develop acute LBP experience a resolution of the symptoms within 6 weeks.**

# Nonspecific Low Back Pain

**Nearly 85% of those who seek medical care for low back pain do not receive a specific diagnosis.**

**The majority of these patients are likely to have a multifactorial cause for back pain, which includes deconditioning; poor muscle recruitment; emotional stress; and changes associated with aging and injury such as disk degeneration, arthritis, and ligamentous hypertrophy.**

**This type of back pain can be given many names; nonspecific low back pain, simple backache, mechanical low back pain, lumbar strain, and spinal degeneration are a few of the common names for this condition.**

**The history and physical examination do not suggest a more specific diagnosis, and diagnostic tests used to exclude other likely causes of the symptoms are negative.**

## *Treatment of Low Back Pain*

Most studies of the various treatments for low back pain, particularly chronic low back pain, unfortunately have shown **limited efficacy**.

Even the most commonly prescribed treatments, such as medications, exercise, and manipulation, in large trials tend to show improvements of only **10 to 20 points** on a 100-Point Pain Visual Analog Scale.

For this reason, most clinicians use **multiple treatments** on a particular patient to sufficient pain relief and an improvement in symptoms

## *Reassurance and Patient Education*

## Behavioral treatment/ cognitive behavioral approach

# Pharmacotherapy
# Management strategies

**Includes management of the underlying disease process causing the pain and symptomatic treatment..**

**Pharmacotherapy is the first way to pain control in LBP .**

**It is essential to individualize the pharmacotherapy because the effect, side-effect and toxicity profile for each drug shows marked variation from person to person.**

**Each medication is given in adequate doses for the appropriate length of time.**

**Once adequate pain relief is obtained, the dose should be maintained for 2 to 3 weeks, while encouraging appropriate exercise and normal activity.**

**If pain control is not achieved with adequate doses of a drug, it is advisable to discontinue that drug.**

## Summary of the groups of medications to treat low back pain based on the types of pain.

| Type of pain | Drug class | Drug group-options |
|---|---|---|
| Nociceptive / Somatic<br>• back pain with or without referred pain | Simple analgesics | Paracetamol |
| | Compound analgesics | Paracetamol + codeine |
| | NSAIDs | Diclofenac |
| | COXIBs | Celecoxib, Etoricoxib |
| | Opioids | Tramadol |
| Neuropathic / radicular pain<br>• Burning back pain<br>• Radicular leg pain | Anticonvulsants | Gabapentin, Pregabalin |
| | Antidepressants<br>- TCAs<br>(Tricyclic antidepressants.) | Amitriptyline, Prothiaden |
| | - SNRIs<br>( Serotonin and norepinephrine reuptake inhibitors) | Venlafaxine, Duloxetine |
| | Opioids | Tramadol, Oxycodone |

# Analgesics

- Simple analgesia Paracetamol is the first line of treatment especially if back pain is mild as it is has few side effects and is widely available. **Do not exceed> 4g / day**

- If simple analgesics are not effective, compound analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs)/COX-2 selective inhibitors can be used.

- In view of the long-term side-effects of NSAIDs, these drugs should only be used for **short-term duration (up to three months) or during flare-ups**.
- There is insufficient data on the use of NSAIDS in **chronic low back pain ?**

# NSAIDS

- **NSAIDS are not more effective than paracetamol or other drugs for ALBP.!**
- **No single NSAIDS overcome the others in terms of effectiveness also COX 2 inhibitors.**
- **strong evidence that various NSAIDS are equally effective .**
- **Silghtly more effective than placebo in CLBP.**
- **Cox2 inhibitirs associated with increased cardiovascular risk.**
- ***American pain society : short term efficacy with moderate effect for ALBP.***

| Drug class | Drug | Recommended dosage | Side effects | Cautions and contraindications | Comments |
|---|---|---|---|---|---|
| Simple analgesic | Paracetamol | 0.5-1 g every 4-6 hours to a max of 4g daily | Rare | Hepatic impairment, alcohol dependence | - Preferred drug particularly in elderly patients<br>- Liver damage following overdosage |
| NSAIDs | Mefenamic acid | 500 mg 8 hourly | Peptic ulcer, GI bleed, Platelet dysfunction, Renal failure, Hypertension, Allergic reaction in susceptible individuals, Increase in CVS events. | Gastroduodenal ulcer, Asthma, Bleeding disorder, Renal dysfunction, Ischaemic heart disease, Cerebrovascular disease, Inflammatory bowel disease, | **Current data suggest that increased CV risk may be an effect of the NSAID/coxib class. Physicians and patients should weigh the benefits and risks of NSAID/coxib therapy.** |
| | Diclofenac | 75-150 mg daily in 2-3 devided doses | | | |
| | Naproxen | 500 mg initially then 250 mg 8 hourly | | | |
| | Meloxicam (Mobic®) | 7.5 – 15mg daily | | | |
| COX-2 inhibitor | Celecoxib (Celebrex®) | 200 mg daily<br>400mg daily in acute pain | Renal impairment, Allergy reaction in susceptible individuals, Increase in CVS events. | Ischaemic heart disease, Cerebrovascular disease, Contraindicated in hypersensitivity to sulphonamides | Associated with a lower risk of serious upper Gastrointestinal side-effects |

# Opioids

- **Weak opioids such as Tramadol (an atypical opioid ) where the use of NSAIDs are contraindicated or not effective**
- **To be helpful for short-term treatment of chronic low back pain , and may be slightly better than NSAIDS in decreasing pain, there is no evidence to show it improves function.**

- **The use of opioids for chronic nonmalignant pain is much more controversial**

- **In elderly patients, chronic opioid therapy may have fewer lifethreatening risks than long-term daily use of NSAIDs/ COX-2 inhibitors.**

- **The use of intermittent injections of potent opioids such as pethidine for chronic back pain is strongly discouraged as it can lead to the development of dependency.**
- **side effects occur in more than half the participants. include nausea, constipation, somnolence, dizziness, and pruritus.**
- **A maximum 7-day supply on prescriptions for opioids .**

# Muscle relaxants

- **The use of muscle relaxants remains controversial.**
- **One reason is that it is unclear what role muscle "spasms" play in low back pain. *Despite this controversy, They seem to be effective.!!***
- ***American pain society : short term efficacy with moderate effect for ALBP.***
- ***These medications fall into three classes of drug: benzodiazepines, the nonbenzodiazepines that are antispasmodics, and antispasticity medication***

# Benzodiazepines

- **The mechanism of action : enhancement of gamma-aminobutyric acid (GABA) inhibitory activity.**
- **Effective for both acute and chronic low back pain for short-term pain relief (trials generally lasted from 5 to 14 days).**
- **Adverse effects sedation, dizziness, and mood disturbances. Rapid withdrawal can cause seizures.**
- **Have serious abuse and addiction potential,**
- **not recommended for low back pain except in unusual cases for a short time.**
- **No evidence exists to support that they are more effective than other muscle relaxants such as cyclobenzaprine.**

# Nonbenzodiazepines/ Antispasmodics

Medications with **multiple mechanisms** of action.
Cyclobenzaprine : structure similar to that of tricyclic antidepressants , act in the brainstem.

Methocarbamol , mechanism of action is not known, could be central nervous system depression.
Effective for **acute low back pain for short-term** pain relief (usually 2 to 4 days' duration.

**Side effects :** drowsiness and dizziness.
No evidence shows that one is more efficacious than another.

**Little literature for chronic pain**.

# Non benzodiazepines/ Antispasticity drugs

- Baclofen: GABA derivative, inhibits transmission at spinal cord and brain , effective for short term pain relief in acute LBP .?

- Dantrolene: works on the muscle , may be effective in acute LBP, side effect :hepatotoxicity.

- Tizanidine: centrally acting alpha 2 agonist , may be effective in acute LBP ( multiple trials ),

# Antidepressants

**Tricyclic antidepressants ( amitriptyline) are an effective treatment for many painful conditions, such as diabetic neuropathy, postherpetic neuralgia, fibromyalgia, and headaches.**

**No adequate data for the treatment of acute low back pain.**

**For chronic low back pain ??.**

**Side effects : dry mouth, blurry vision, constipation, dizziness, tremors, and urinary disturbances.**

**The selective serotonin reuptake inhibitors, SSRI ( fluxetine) are not effective in chronic low back pain,**

**The selective serotonin and norepinephrine reuptake inhibitors, SNRI ( duloxetine)are effective for chronic LBP.**

# Antidepressants

| | | | | |
|---|---|---|---|---|
| TCA (Tricyclic antidepressant) | Amitriptyline | Start with 10-25 mg nocte. Increase weekly by 25 mg/d to a max of 150 mg/d | Anticholinergic effects eg. Dry mouth, drowsiness, urinary retention, arrhythmias | Not recommended in elderly patients and patients with cardiac disease, glaucoma, renal disease |
| SNRI (Serotonin and norepinephrine reuptake inhibitor) | Duloxetine | Start with 60mg once daily, increase to a maximum of 120 mg/ day in evenly divided doses. | GI disorders, excessive sweating, CNS disorders eg. dizziness, fatigue, insomnia, somnolence, blurred vision, dysuria | Concomitant use with MAOIs, potent CYP1A2 inhibitors. Hepatic or severe renal impairment. Uncontrolled narrow-angle glaucoma |

# Anti-convulsants

**gabapentin and pregabalin, are widely used for neuropathic pain.**
**Trials have not yet been conducted with these medications for the treatment of low back pain.**
**One study of topiramate showed small improvement in chronic low back pain. Side effects include sedation and diarrhea.**

| | | | | |
|---|---|---|---|---|
| Anti-convulsants | Gabapentin (Neurontin®) | 300-3600 mg/d.<br>Day 1 : start at 300mg nocte.<br>Day 2 : 300 mg bd.<br>Day 3 : 300 mg tds.<br>Thereafter, increase by 300 mg/d every 1-7 days | Drowsiness, Dizziness, GI symptoms and mild peripheral oedema | Dose adjustment needed in renal impairment |
| | Pregabalin (Lyrica®) | Start with 150mg/d (in 2 divided doses). If needed increase to 300mg/d after 3-7 days intervals, if needed increase to 600mg/d after 7-day interval. | Drowsiness, Dizziness, GI symptoms and mild perpheral oedema | Dose adjustment needed in renal impairment |

# Systemic Steroids

- IV, IM or Oral
- Not to be effective for axial (nonradicular) low back pain.

- In radicular LBP single IM dose or tapered oral dose of CS have not been found to be superior to placebo.

- IV bolus of 500 mg methylprednisolone provided a small and transient improvement in leg pain during first 3 days.

- Side effects: arythmia, circulatory collapse with IV methylprednisolone > 500 , flushing , hypertension , hyperglysemia.

## Herbal Medicines

Several herbal medicines **are used** in the treatment of low back pain. Literature studies in this area tend to be of **low quality**, but several herbal preparations seem to **reduce pain more than placebo**, including *Capsicum frutescens (cayenne) in a topical preparation, Salix alba (white willow bark), and Harpagophytum procumbens (devil's claw).*

# Topical medication

- Topical NSAIDs are effective for acute musculoskeletal disorders. However, there is no evidence supporting its long term use.

# conservative management of lumbosacral radiculopathies

- **Nonsteroidal anti-inflammatory drugs (NSAIDs) reduce inflammation and to provide pain relief. (small effect size)**
- **No definite support exists for oral steroids in the treatment of acute radiculopathy. Moderate quality research in the short term.**
- **The neuropathic pain agents (anticonvulsants and tricyclic antidepressants): small improvements in pain scores.**

- **chronic radiculopathy,( meta-analysis) : NSAIDs, corticosteroids, tricyclic antidepressants, and anticonvulsants, no efficacy over placebo.**

- **Opioids : In acute radiculopathy have limited effectiveness, should be used only in severe cases.**

- **Tumor necrosis factor alpha inhibitors, no significant pain relief, limited clinical; value.**
- **Epidoral steroid injection**

**Pharmacological treatments for low back pain in adults: an overview of Cochrane Reviews**

Aidan G Cashin, Benedict M Wand, Neil E O'Connell, Hopin Lee, Rodrigo RN Rizzo, Matthew K Bagg, Edel O'Hagan, Christopher G Maher, Andrea D Furlan, Maurits W van Tulder, James H McAuley
Authors' declarations of interest

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- **Seven Cochrane Reviews that included 103 studies (22,238 participants) six medicines or medicine classes: paracetamol, non-steroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, benzodiazepines, opioids, and antidepressants**

# An overview, phamacotherapy

- Acute LBP:
- **Paracetamol: No effectiveness**
- **NSAIDs : Small between group difference**
- **Muscle relaxants & benzodiazepines: Small between group difference**
- **Opioids: Not identified for acute LBP**
- **Antidepressants : Not identified for acute LBP**

- Chronic LBP:
- **Paracetamol: Not identified for acute LBP**
- **NSAIDs: Small between group difference**
- **Muscle Relaxants & benzodiazepines : Low evidence for small between group difference**
- **Opioids: Medium between group difference for tramadol**
- **Antidepressants: No difference compared to placebo**

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Systematic Review

# Guideline summary review: an evidence-based clinical guideline for the diagnosis and treatment of low back pain

D. Scott Kreiner, MD*,[a], Paul Matz, MD[b], Christopher M. Bono, MD[c],

**Anticonvulsant: insufficient data**
**Antidepressants: not recommended**
**Non selective NSAIDs : fair evidence for effectiveness**
**Selective NSAIDs : insufficient data**
**Oral or IN steroids :not effective**
**Opioids for short term : fair evidence for effectiveness**
**Topical treatments:**
**Lidocaine patch :insufficient data**
**Topical capsicum: effective**

**THE NORTH AMERICAN SPINE SOCIETY , NASS**