

MULTIPLE SCLEROSIS AND PAIN: A COMPREHENSIVE LITERATURE REVIEW OF DEVICES, DRUGS, AND EMERGING THERAPIES (2015-2025)

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Introduction

Pain in MS arises from neuroinflammatory, neurodegenerative, musculoskeletal, and psychosocial factors, creating a complex burden.

Expanded Therapeutic Landscape (2015-2025):

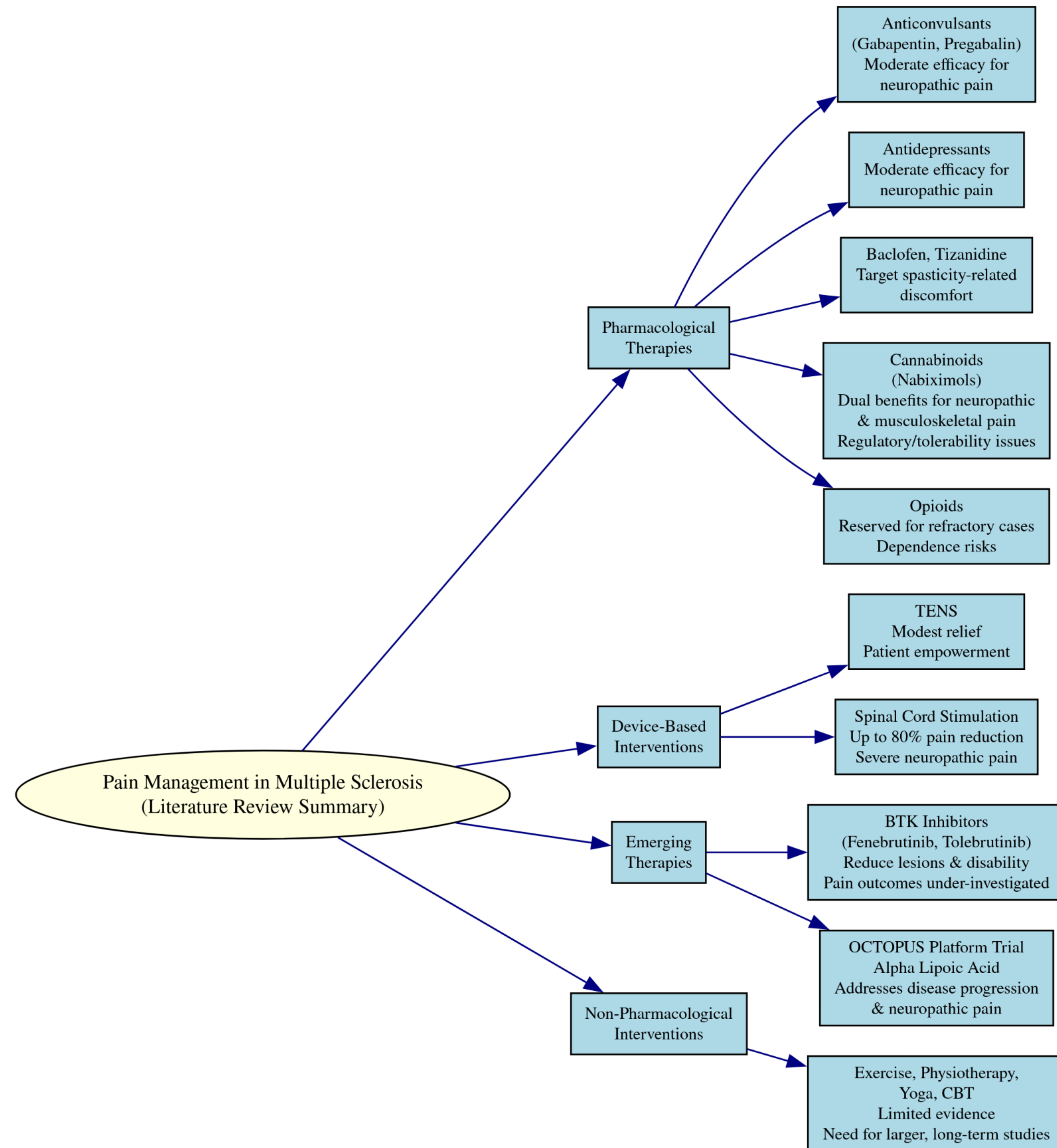
- **Pharmacological Treatments:** New and improved medications targeting pain relief.
- **Device-Based Interventions:** Neurostimulation devices introduced to alleviate pain.
- **Non-Pharmacological Approaches:** Holistic strategies, such as physical therapy and psychological support, integrated into treatment plans.
- **Emerging Disease-Modifying Therapies (DMTs):** Novel therapies aimed at altering disease progression and reducing pain.

Methods

A structured literature review of peer-reviewed articles, clinical guidelines, and trial data published between 2015 and 2025 was undertaken, emphasizing both symptomatic management and novel disease-targeting approaches.



Outsmarting MS Pain's Game: A Decade of Devices, Drugs, and Breakthroughs (2015-2025)



Results

Pharmacological Therapies:

- Anticonvulsants (gabapentin, pregabalin): Moderate neuropathic pain relief.
- Antidepressants: Moderate neuropathic pain relief.
- Baclofen, tizanidine: Target spasticity pain.
- Cannabinoids (nabiximols): Neuropathic & musculoskeletal pain relief; regulatory/tolerability limits.
- Opioids: For refractory cases; dependence risks.

Device-Based Interventions:

- TENS: Modest relief, patient empowerment.
- Spinal cord stimulation: Up to 80% pain reduction for severe neuropathic pain.

Emerging Therapies:

- BTK inhibitors (fenebrutinib, tolebrutinib): Reduce lesions & disability; pain outcomes unclear.
- OCTOPUS trial (alpha lipoic acid): Targets disease progression & neuropathic pain.

Non-Pharmacological Interventions:

- Exercise, physiotherapy, yoga, CBT: Limited evidence; need larger, long-term studies (2018 Cochrane review).

Discussion

- Effective MS pain management requires a multidisciplinary approach, integrating pharmacological, device-based, emerging, and holistic interventions.
- Future research should focus on pain-specific outcomes in DMT trials, enhance evidence for non-pharmacological therapies, and develop precision strategies for tailored interventions.
- Addressing these research gaps could connect symptomatic relief with disease modification, enhancing patient quality of life.

References

1. Neuropathic Pain Secondary to Multiple Sclerosis: A Narrative Review - PubMed, accessed September 14, 2025, <https://pubmed.ncbi.nlm.nih.gov/38962595/>
2. Rapisarda A, Ioannoni E, Izzo A, D'Ercole M, Montano N. Is There a Place for Spinal Cord Stimulation in the Management of Patients with Multiple Sclerosis? A Systematic Review of the Literature. Minim Invasive Surg. 2021 Apr 19;2021:9969010. doi: 10.1155/2021/9969010. PMID: 33986958; PMCID: PMC8079186.
3. Optimal Clinical Trials Platform for Progressive Multiple Sclerosis <https://www.mrcctu.ucl.ac.uk/studies/all-studies/o/octopus/>
4. Amatya B, Young J, Khan F. Non-pharmacological interventions for chronic pain in multiple sclerosis. Cochrane Database Syst Rev. 2018 Dec 19;12(12): CD012622. doi: 10.1002/14651858.CD012622.pub2.PMID: 30567012; PMCID: PMC6516893.