



# Gabapentinoid Use for Perioperative Acute Pain Management

Kayla Browning SAA  
Nova Southeastern University, Ft. Lauderdale



## Abstract

Postoperative pain management has been a consistent problem within anesthesia as acute pain can slow recovery. Adequate analgesia, decreasing hospital length of stay, and early mobilization after surgical exposure are all goals of perioperative pain management. Different patients experience different levels of pain depending on past experiences, social setting, or type of surgery (Mariano, 2021). Postoperative pain management has been a continuous battle, especially when taking into account the opioid pandemic. To try and limit opioid use, enhanced recovery after surgery (ERAS) protocols are being used in order to inhibit pain transmission aside from the opioid pathway. Drugs that can modulate neurotransmission of pain include: gabapentinoids, acetaminophen, ketamine, and clonidine (Ricciardi, 2019). Gabapentinoids, in particular, have been recently unsupported by research for the use of postoperative pain management within multimodal analgesia despite their current use in ERAS protocols. The purpose of this study is to investigate the use of preoperative gabapentinoid administration as an analgesic agent for acute postoperative pain.

## Introduction

The traditional drug class to treat postoperative pain is with opioids. Opioids directly inhibit the neurotransmission and pain perception of the afferent pathway. However, patients can become dependent on opioids, and this is why multimodal analgesia has come into play. Multimodal analgesia has proven benefits to decrease opioid use by inhibiting other areas of the pain pathways such as substance P, CGRP, glutamate, aspartate, and GABA (Mariano, 2021). As part of the routine ERAS protocol, gabapentin and pregabalin are given preoperatively to treat acute postoperative pain. Even though gabapentinoids are still used as an anticonvulsant, the off-label use for pain management has recently been questioned (Verret, 2020). Patient populations that should not receive gabapentinoids due to side effects of increased dizziness and visual disturbances include those over 65 years old, breathing sleep disorder, ventilatory depression, and patients who already experience dizziness. It was also noted that patients who can benefit from gabapentinoids include patients at an increased risk for postoperative pain, those who are chronic users of opioids, or those who are already users of gabapentin (Girish, 2018).

## Methods

This paper is a systematic review done by Verret, Michael, et al. that compiled several studies to investigate if there is any clinical benefit for the use of gabapentinoids for postoperative pain management. Adult patients, in an array of different areas of surgery, were used to collect data for intensity of postoperative acute pain. 281 trials compared the use of gabapentinoids to that of the control group, with no use of gabapentinoids in order to find the minimally important thresholds. At the 6 hour, 12 hour, and 48 hour postoperative time mark pain scores were taken out of a 100-point scale. This study did not include patients who are chronic opioid users or those who are current users of gabapentinoids.

Table 1. Summary Estimates from Meta-analyses with the Assessment of the Statistical Heterogeneity and the Quality of the Evidence

Outcomes	Number of Patients		Summary Estimate		Quality of the Evidence	
	Number of Trials	Gabapentinoids	Control	Mean Difference or Risk Ratio [95% CI]	I <sup>2</sup> , %	Grades of Recommendation, Assessment, Development, and Evaluation Rating
Postoperative acute pain (100-point scale)						
6 h	129	5,499	4,710	-10 [-12 to -9]	91	Low <sup>†</sup>
12 h	130	5,871	5,198	-9 [-10 to -7]	90	Low <sup>†</sup>
24 h	141	6,593	5,481	-7 [-8 to -6]	88	Low <sup>†</sup>
48 h	59	3,434	2,778	-3 [-5 to -1]	88	Low <sup>†</sup>
72 h	32	2,410	1,724	-2 [-4 to 0]	76	Low <sup>†</sup>

## Results

Results showed at 6, 12, 24, and 48h postoperative there was a slight decrease in pain intensity with gabapentinoid use. At 72h there was no change. The clinical effect of analgesia was insignificant with gabapentinoid use although data showed a lower pain intensity. In other words, the decrease in intensity of pain with the use of gabapentinoids fell below the minimally important threshold of 10 out of 100 points. This holds true for each time point. It was found, however, that there was a decrease in postoperative nausea and vomiting. Results show that gabapentinoids do not improve postoperative pain above the significantly important threshold.

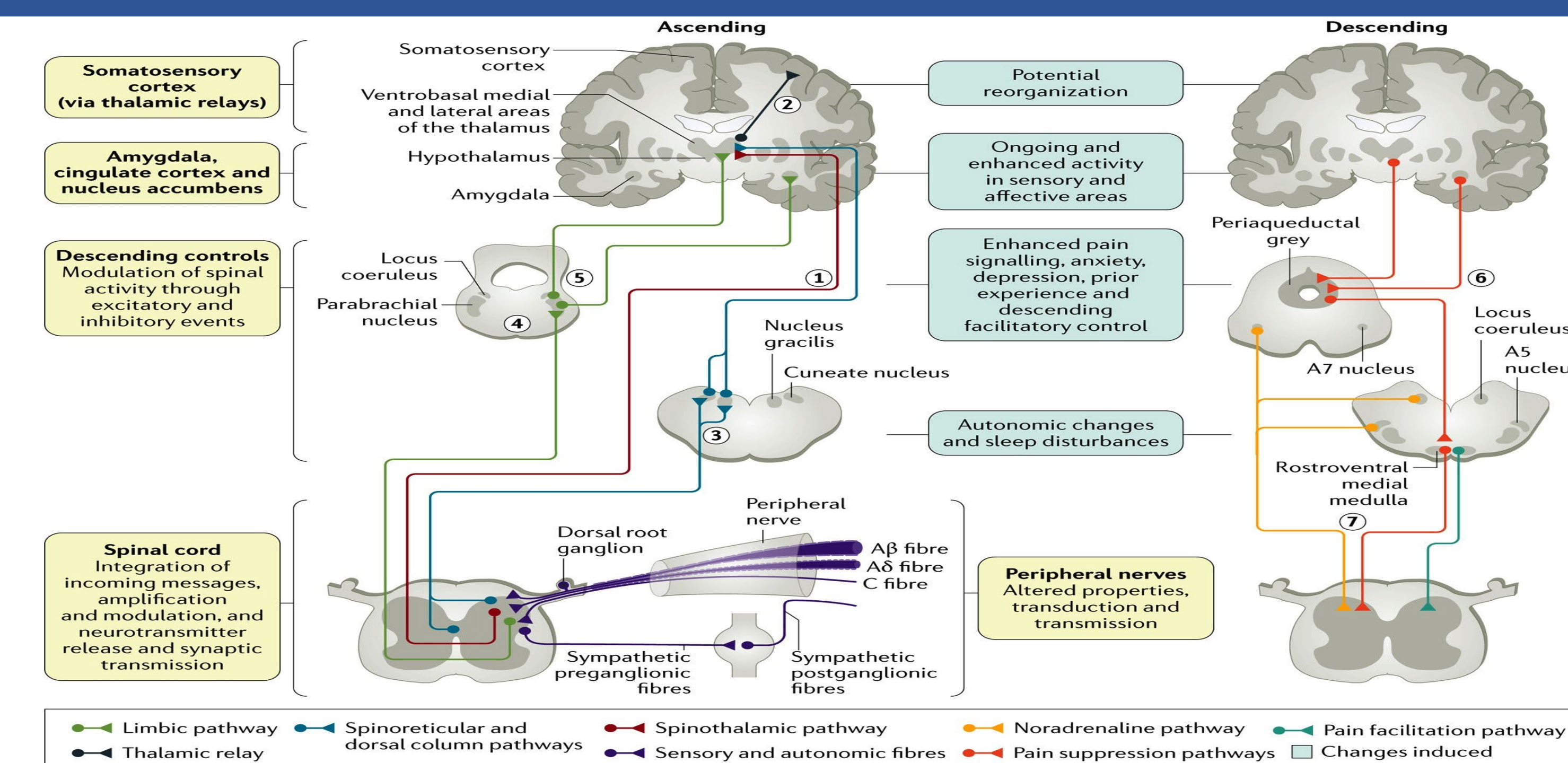


Figure 1: Neuronal Pain Pathways (Colloca, 2017)

## Discussion

The paper discusses that the use of gabapentinoids for acute postoperative pain management as outlined in ERAS protocols are not of benefit. Although pain scores are lower at some time points, this is not clinically significant. These findings were consistent despite differences in the dosage regimen amongst the trials. It is also important to note that results were similar when comparing gabapentin and pregabalin (Verret, 2020). The effort for opioid-sparing analgesia effect was minimal and insignificant.

## Conclusions

This systematic review concluded that the perioperative use of gabapentinoids had no clinically significant benefit for postoperative acute, subacute, and chronic pain. The development of ERAS protocols within anesthesia has taken a lot of research in order to manage our patients more effectively with better patient outcomes. Although a lot of time has gone into these protocols, and as new research comes out some of these protocols are put into question, such as the use of preoperative gabapentinoids for postoperative acute pain management. Pain can be very ambiguous among patients and can present providers with a challenge in order to manage. The concept of multimodal analgesia within ERAS protocols has had great success, however, it takes studies like this to identify which drugs are appropriate to obtain adequate analgesia.

## Contact

Kayla Browning, SAA  
Nova Southeastern University  
kb2580@mynsu.nova.edu

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