



Change in opioid consumption following dorsal column spinal cord stimulation: a systematic review and meta-analysis

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INTRODUCTION

- Chronic pain is one of the leading causes of disability worldwide¹
- Many patients with chronic pain are eventually treated with opioids. Opioids come with significant undesirable side effects including respiratory depression, addiction, tolerance, among others
- Dorsal column spinal cord stimulation (SCS) is one treatment option for chronic pain that could potentially allow patients with chronic pain to consume less opioids
- This study aims to investigate opioid consumption before and after SCS implantation for treatment of chronic pain by performing a systematic review and meta-analysis of existing literature
- The primary outcome of this study is continuous (ie morphine milligram equivalent (MME) dose usage) and dichotomous (ie taking or not taking) opioid use at 12 months post-SCS implantation

METHODS

- To identify potential studies a comprehensive literature search of multiple databases since their inception was conducted
- Inclusion criteria was defined as any randomized control trial (RCT) or observational study, including case series with 10 or more patients, in which patients underwent SCS implantation for treatment of chronic pain. Database studies were excluded as there was no way to verify if participants from individual studies were also included in the database data
- Study screening, data extraction, risk of bias (RoB), and grading of recommendations assessment, development, and evaluation (GRADE) were performed by two independent reviewers
- A random effects model was utilized for meta-analysis. Results were expressed as weighted mean difference (WMD) or odds ratio (OR) with 95% confidence intervals (CI)
- Certainty assessment was performed following guidelines set by GRADEPRO²

FIGURES

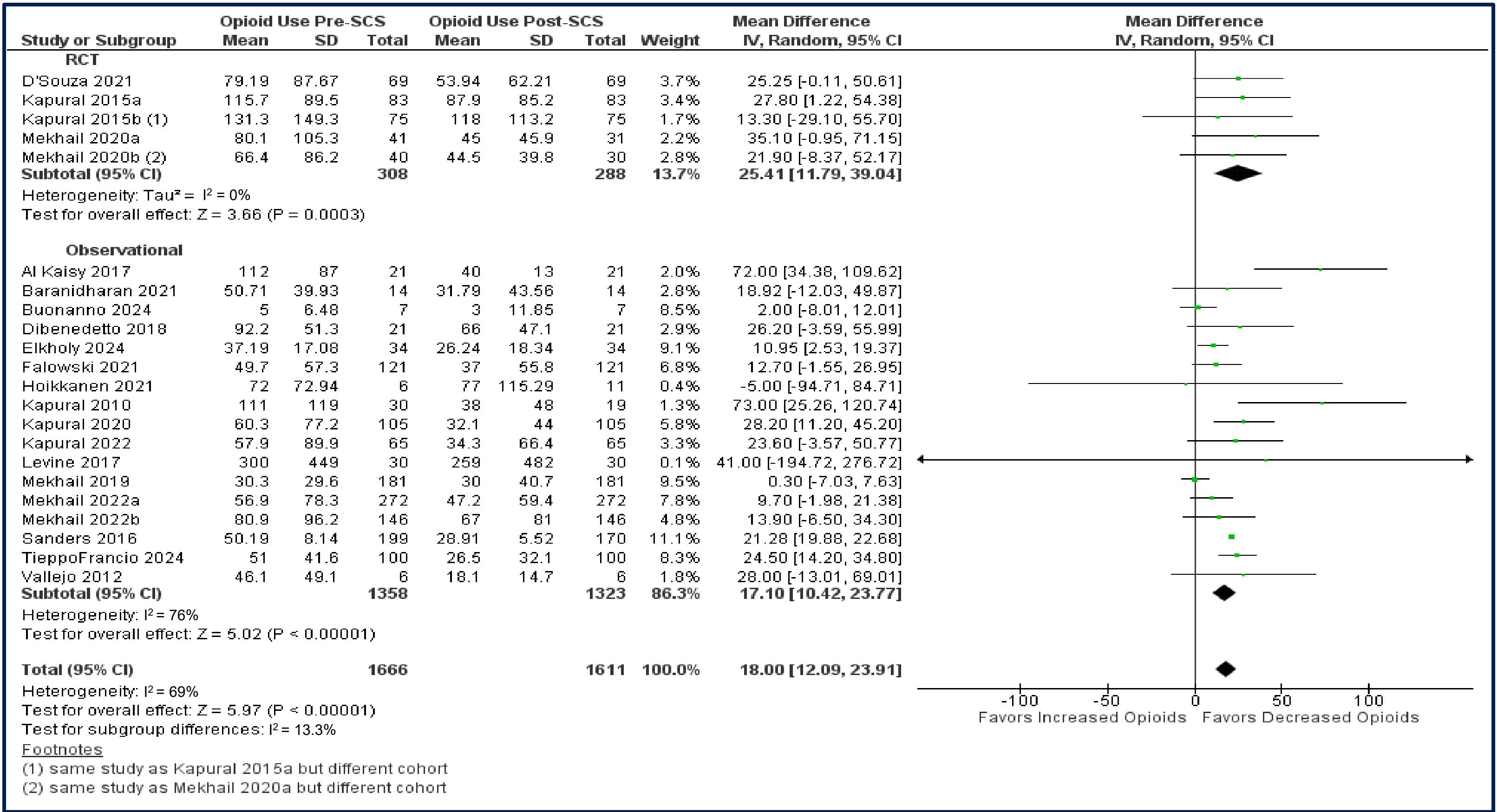


Figure 1. Forest plot for continuous opioid use outcomes at 12 months post-SCS implantation.

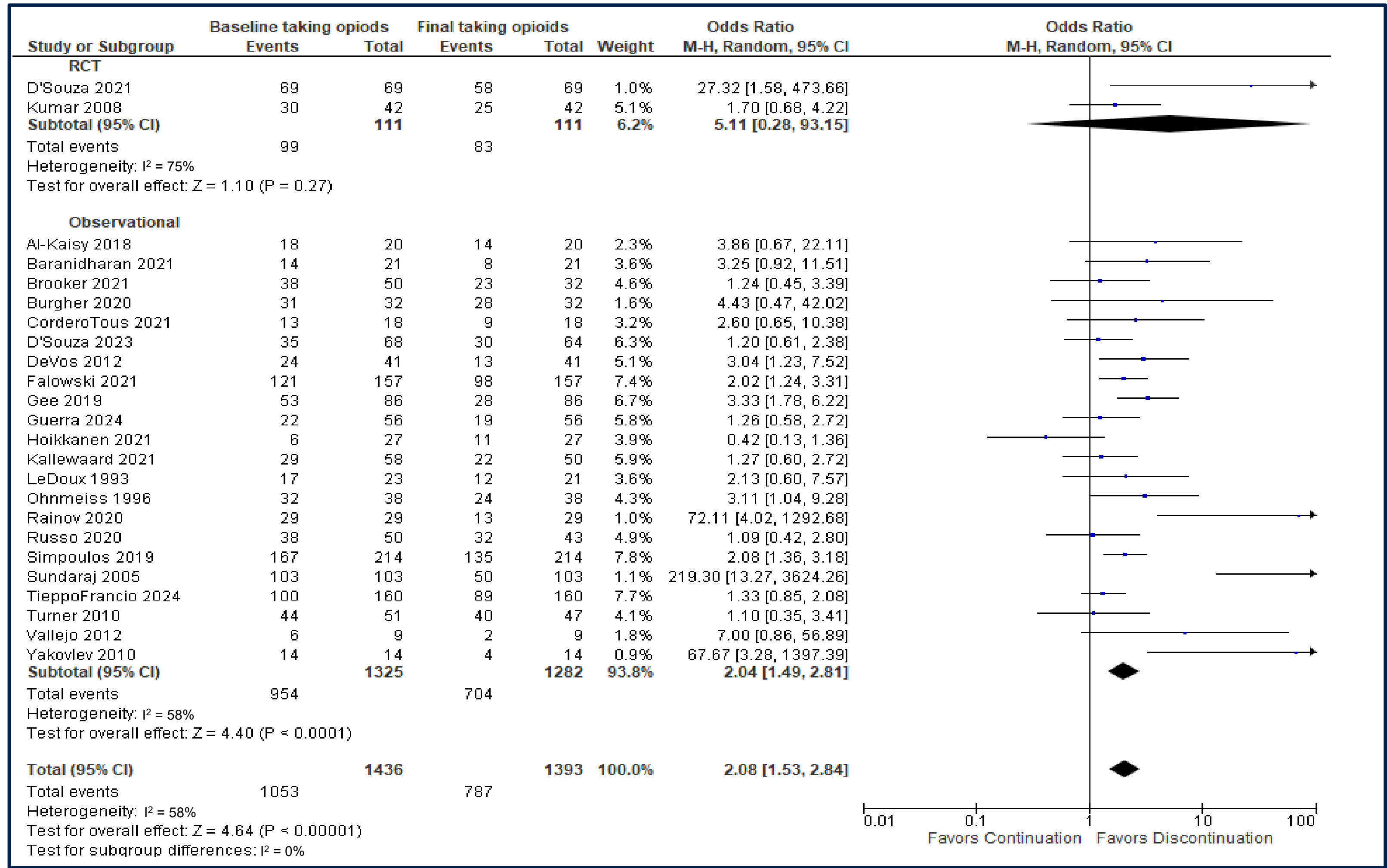


Figure 2. Forest plot for dichotomous opioid use outcomes at 12 months post-SCS implantation.

RESULTS

- 2784 studies were identified from the search strategy. After screening, 37 unique studies (4 RCTs and 33 observational studies) were included in the primary analysis comprising a total of 3102 participants
- At 12 months post-SCS implantation the MWD in opioid use was 18.00 MME [95% CI: 12.09, 23.91, I² 69%]
- OR for elimination of opioid use altogether at 12 months post-SCS implantation was 2.04 (95% CI: 1.53, 2.84, I² 58%)
- Based on GRADE assessment, the certainty of our results is low, largely due to heterogeneity in results and some concerns for bias

DISCUSSION/CONCLUSIONS

- This large meta-analysis demonstrates robust statistically significant data supporting decreased absolute and dichotomous opioid use at 12 months post-SCS implantation among patients with chronic pain.
- To date there is no published data on what constitutes a clinically meaningful absolute or dichotomous opioid dose reduction among chronic pain patient populations so we are unable to definitively state the magnitude of the clinical significance of these results. However, a recent meta-analysis found robust data demonstrating that general opioid dose tapering in patients with chronic non-cancer related pain positively influences a broad range of outcomes including pain intensity, headache disability, anxiety, depression, and pain catastrophizing, all of which are desirable when treating patients with chronic pain.³

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