

# The State of Research Funding for Interventional Chronic Pain Therapies

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Chronic pain is among the most common chronic conditions in the United States, with over 50.2 million adults (20.5%) reporting pain either daily or on most days.<sup>1</sup> Only recently has pain medicine research, generally, begun to receive increased federal funding and increased attention compared to other areas of medical research. Unfortunately, the majority of funding for pain medicine research remains focused on opioid use, misuse, and addiction,<sup>2</sup> despite data demonstrating that the “prescription opioid crisis” of the early years of the current millennium ended a number of years ago.<sup>3,4</sup> In the United States, there continues to be a lack of access to federal funding agencies dedicated to research in interventional pain medicine, which has significant implications for the development of effective treatments for chronic pain. This analysis will address the state of pain medicine research, the funding concerns associated with pain medicine research, and potential solutions to improve the quality of pain medicine research in the United States.

The current state of funding for pain medicine research is problematic due to limited funding sources, and particularly the dearth of federal funding for the study of interventional pain management. While funding for studies on opioid prescribing, drug abuse, and aging is generally available, there is little funding granted for the development of minimally invasive treatment options for pain management, such as nerve blocks, nerve ablations, peripheral and spinal cord stimulation, vertebral augmentation, and intrathecal pump implantation. In order to assess the accuracy of our concern, we reviewed each of the 104 manuscripts that have been published in the Journal of Pain Research from January 1, 2023 through the date of writing this paper. Of the 104 published manuscripts, 20 pertained to interventional pain medicine. Six of these manuscripts were submitted by first authors from Asia, with 4 funded by governments and 2 representing unfunded research. One manuscript from Europe was published, and that was unfunded. One manuscript was published from South America, which was government funded. The remaining 12 manuscripts were published by United States authors. All 12 of these manuscripts were unfunded – receiving no support whatsoever, either from government grants, university grants, or funding from industry.<sup>5</sup> The United States National Institutes of Health (NIH) estimates funding 1 billion dollars for opioid research and 825 million dollars for opioid misuse and addiction research in 2023.<sup>2</sup> By comparison, the NIH estimates funding only 200 million dollars for peripheral neuropathy research, 69 million dollars for back pain research, 13 million dollars for fibromyalgia research, and 8 million dollars for neck pain research in 2023.<sup>2</sup> Most concerning is the NIH’s inability to report any dedicated funding for interventional pain medicine in their 2023 categorical spending report.<sup>2</sup>

Insufficient federal funding for chronic pain research has hindered the progress of developing additional innovative treatments and conducting large-scale clinical trials that would bolster evidence-bases. Consequently, this has resulted in a situation in which provision of current treatments has not necessarily been optimized, and patients may be left with few options to manage their pain, often suboptimally, such as may be provided with opioids as a monotherapy. Additionally, the lack of comparative and functional outcome studies between different treatments has resulted in challenges for healthcare providers and patients to make fully informed decisions regarding the best treatment options. Lastly, this lack of funding has an impact on deciding which treatments third party payors will cover, which is becoming increasingly

problematic. The inadequate funding for other non-pharmacological approaches to pain management, such as mindfulness and acupuncture, is also a cause for concern. These approaches may be effective for some patients, and further research is necessary to establish their safety and efficacy in managing chronic pain. However, in 2019 and 2020, less than 0.5% of the total NIH budget was allocated to complementary and integrative health research.<sup>6,7</sup> An increase in funding for research in this area could enhance our understanding of the benefits and risks of these approaches and provide more comprehensive options for pain management, potentially in conjunction with interventional approaches. Given the complexities of chronic pain that often require interdisciplinary care, addressing the limited funding for all pain medicine research is essential for advancing the development of effective treatments for those enduring chronic pain.

The predominant funding of medical research by industry<sup>8</sup> raises concerns regarding potential transparency, bias, and implications for patient care.<sup>6</sup> As was the case with the pharmaceutical industry, medical device manufacturers often fund studies to promote their products, creating a potential conflict of interest (COI) for researchers. These COIs can result in biased or incomplete research findings that favor the interests of the funding source rather than patients and the broader scientific community. One such example in industry-funded pharmaceutical research is the case of Vioxx, a painkiller marketed by Merck, in which results of clinical trials sponsored by the company suggested that Vioxx was safe and effective.<sup>6</sup> However, after the drug was approved and widely used, it was found to increase the risk of heart attacks and strokes. It was later revealed that Merck had suppressed data that revealed the risks of Vioxx in its clinical trials and influenced the trial designs to downplay those risks. Another pharmaceutical industry example is Purdue Pharma and OxyContin, in which the company aggressively marketed the drug as a safe and non-addictive painkiller, contributing to widespread addiction and overdose deaths.<sup>9</sup> Purdue Pharma was later found guilty of misleading marketing and agreed to pay billions of dollars in settlements. Although industry-funded research has led to significant advances in pain management, there exists a risk that studies may be designed in a manner that is biased in favor of the company's products, leading to inflated claims regarding safety and efficacy, which potentially harms patients. Non-industry funded research is necessary to promote transparency and reduce the risk of bias in the reporting of study results, ensuring that patients receive optimal care based on unbiased data.

Further, industry-funded research can create a perception of bias to outside readers, potentially leading to the dismissal of the findings of the studies.<sup>10</sup>

As a result, some may view industry-funded studies with skepticism and distrust, even if the studies are well-designed and executed, and have undergone rigorous peer review.<sup>11</sup> This perception of bias can have serious potential implications for patient care. If the public and healthcare providers lose confidence in industry-funded studies, they may be less likely to adopt new treatments or medical devices, even if they are safe and effective. This may decelerate the progress of medical research and limit the options available for patients with chronic pain. Accordingly, it is essential to promote transparency in the reporting of study results, including disclosure of potential conflicts of interest and funding sources. Non-industry funded research is also necessary to provide an independent perspective on pain management, reduce the risk of bias, and increase the confidence of healthcare providers and patients regarding the safety and efficacy of novel treatments.

The contributions made by innovative medical device and technology companies to the field of pain medicine are significant and cannot be overstated. These companies invest substantial amounts of financial and other resources into research and development,<sup>12</sup> resulting in the creation of innovative devices and technologies for managing chronic pain. These efforts have led to a greater variety of treatment options for patients suffering from chronic pain, providing alternatives to traditional pharmacological therapies that may be less effective or associated with unwanted iatrogenic complications. Moreover, medical devices such as spinal cord stimulators, dorsal root ganglion (DRG) stimulation systems, and peripheral nerve stimulation systems have revolutionized pain management by providing opioid-sparing targeted pain relief to patients. As such, the contributions made by innovative medical device and technology companies have substantially improved the lives of many suffering from chronic pain and have the potential to continue to transform pain management in the future.

In recent years, several efforts to increase federal funding for pain medicine research have been made. One major initiative was the National Pain Strategy, which was released in 2016 by the US Department of Health and Human

Services.<sup>13</sup> This strategy aims to improve pain care, education, and research by addressing gaps in the understanding and management of pain. As an aspect of this initiative, the NIH established the Helping to End Addiction Long-term (HEAL) Initiative in 2018.<sup>14</sup> To date, over two billion dollars have been invested towards prevention strategies and safe, non-addictive treatments for opioid misuse, addiction, and pain. In addition to these efforts, calls for increased federal funding for pain medicine research have been made. For example, the Alliance for Balanced Pain Management, a coalition of healthcare providers, patient advocates, and others, has urged Congress to increase funding for pain research and to make this this additional funding a priority.<sup>15</sup> Lawmakers have also introduced bills aimed at increasing funding for pain research and improving pain management, such as the National Pain Care Policy Act of 2009.<sup>16</sup> Another avenue for increasing funding for pain medicine research is the establishment of private foundations and organizations dedicated to this cause. The Mayday Fund is one such nonprofit organization that has supported research in pain and related fields for several decades.<sup>17</sup> Unfortunately, relatively little of this federal and private foundation funding has gone toward the study of interventional approaches to the management of pain.

The current funding structure for pain research in the United States should be thoroughly re-evaluated to ensure that it is adequately addressing the needs of patients suffering from chronic pain. While research on opioid prescribing and drug abuse is crucial, there must be a greater focus on the development of interventional and medical technologies that can improve pain management outcomes. One potential solution is for funding agencies such as the NIH to prioritize pain medicine research and allocate dedicated funding for non-opioid study. This could ensure that pain medicine research receives the attention and resources it deserves, encouraging researchers to focus on developing new and innovative treatments for pain. Such a measure would serve to address concerns regarding potential bias in industry-sponsored research and promote greater transparency in reporting study results. Additionally, increasing funding and attention to areas such as the development of non-pharmacological treatments for pain, including cognitive-behavioral therapy, mindfulness-based stress reduction, and physical therapy, could be beneficial. These treatments have been demonstrated to be effective in managing chronic pain and are associated with fewer iatrogenic complications and adverse events than are traditional pharmacological treatments. Nonetheless, more research is required to fully understand their mechanisms and to develop the most effective interventions.

In conclusion, all pain research would benefit from a paradigmatic revision of the funding that supports it. We posit that although the vast majority of funded published studies on interventional approaches are currently supported by industry, there is no evidence that this results in biased studies more frequently than is the case in other fields of pain medicine investigation. Certainly, pain journal editors are quite vigilant regarding the potential for bias in these investigations and reporting of results, perhaps to the extent that a “reverse bias” exists. Irrespective, government funding of interventional pain medicine would serve to reduce the potential appearance of improprieties of which industry and industry-funded investigators are occasionally accused. Increased funding from diverse sources and greater transparency in research funding and reporting will increase the likelihood of publication of ethical and unbiased outcomes. By prioritizing interventional pain medicine research, government funders can help interventional pain medicine maintain its scientific integrity while facilitating our efforts toward developing more effective treatments for chronic pain to curb drug abuse and improving the functional quality of life for millions of pain sufferers around the world.

## Disclosure

Dr Michael E Schatman is a research consultant for Modoscript and Collegium, and an AdComm consultant for Syneos Health, outside the submitted work. The authors report no other conflicts of interest in this work.

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