

Policy and Educational Brief



PEDIATRIC CHRONIC PAIN:

Prevalence, economic impact, and its
relevance to the current opioid epidemic



PEDIATRIC CHRONIC PAIN: Putting a Bandage on a Wound that Will Continue to Bleed

The problem:

As our country is faced with addressing a surge in opioid abuse and misuse, pediatric chronic pain is often absent from policy proposals and funding initiatives despite its prevalence, economic impact, and relevance to the current opioid epidemic.

It is estimated that approximately 5-38% of children and adolescents suffer from chronic pain^{1,2} and, from 1994 to 2007, pediatric opioid prescription rates doubled. Pediatric chronic pain is associated with a significant level of economic burden in this country. Recent studies estimate that the economic cost of pediatric chronic pain is 19.5 billion dollars annually³ and it accounts for 11.8 billion dollars in total incremental health care expenditures, which is more than expenditures associated with obesity (\$0.73 billion) and asthma (\$9.23 billion) combined.⁴

Children with chronic pain will soon be adults with chronic pain. Poor pain management in childhood not only affects the quality of life of children and their families, but also puts children at risk for continued and heightened impairment as they move into adulthood. Unfortunately, up to 73% of children and adolescents with chronic pain will continue to have pain in adulthood and are likely to develop new pain conditions.^{5,6}

The aim of this brief is to bring pediatric pain to the forefront of the discussion of pain management in this country. The following pages will shed light on crucial issues that have likely contributed to the mismanagement of pediatric chronic pain and opioid misuse and abuse:

- Limited knowledge of the complex nature of pediatric chronic pain and effective, comprehensive pain management has resulted in an attack on opioids without a plan to address a significant contributor to the current state of opioid misuse and the pain epidemic: ***pediatric patients do not have early access to effective pain treatment, and untreated pediatric pain becomes adult pain.***
- Addressing opioid addiction and prescription monitoring is important, and if we do not also direct efforts towards providing pediatric patients with early access to effective, comprehensive pain management, we are essentially just putting a bandage on a wound that will continue to bleed.

What we know about pediatric chronic pain:

Chronic pain is a complex, biopsychosocial condition and 5-38% children and adolescents suffer from chronic pain.^{1,2,7} Chronic pain in children and adolescents can present in the form of recurrent headaches, stomach pain, general musculoskeletal pain, or neuropathic pain. It can develop as a result of experiencing pain from another condition (e.g., arthritis, cancer, sickle cell disease), following an injury or operative procedure, or can develop in the absence of injury or damage. To best understand and treat pain in children, the pain condition must be considered within a biopsychosocial model (a model that includes biological, psychological, and social factors).

In 2011, the Institute of Medicine (IOM) released *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education and Research* and called for a “cultural transformation in the way pain is perceived, judged and treated.”⁸ The healthcare industry has a strong attachment to the biomedical approach to diagnosing and treating disease, which prioritizes identifying and treating an injury, tissue damage, or other observable physical pathology. Decades of pain research have taught us that the experience of pain is complex, it is not directly related to the injury or damage sustained, and chronic pain in particular can often occur in the absence of physical pathology. To date, a medical test cannot confirm the amount of pain a child is experiencing, a factor that presents a problem for those providers working within a biomedical framework.

We now know that the experience of pain, regardless of the cause, is processed in multiple areas of the brain and input from each area determines the degree of our pain experience. Pain messages are determined by the same areas of the brain that process not only sensory input, but those that process attention, emotion, fear, memory, and behavior to name a few. Factors that affect all of those areas have the potential to alter a child’s pain experience. Inherently, pain is a warning signal that serves to protect us from real or potential danger and our brain takes input from multiple sources to determine the degree of danger or pain we are experiencing.

Imagine a child playing basketball. As she approaches the basket, a member of the opposing team slams into



Limited understanding of the complex, biopsychosocial nature of pediatric chronic pain is likely to result in ineffective and potentially harmful treatment.

her. She falls to the ground and grimaces, no foul is called, and she jumps back up to keep playing. Now, imagine that same girl running through the kitchen. She trips and falls on the hardwood floor, her father gasps, she starts to cry, complains of pain, and will not get up. In both of these scenarios, biological (nerve messages), psychological (stress, mood, fear, thoughts), and social (peer/family responses, environment) factors all interact and affect the experience of and response to pain. It is likely that this girl experienced different levels of pain in each of these examples because the biopsychosocial context varied and the brain determined that the level of danger was different in each instance (i.e., more danger = more pain). However, there is no way to objectively confirm this through a physical exam, blood test, or other standard biomedical procedure. Thus, the child’s subjective report of pain, her behavioral responses, and degree of impairment serve as the clinical indicators of her pain.

As pain persists, the dynamic interaction between biological, psychological and social factors continues and can lead to altered or inaccurate pain/danger messages. As strain on the nervous system continues, it can become hypersensitive to various forms of input (e.g., any nerve signal, stress, anxiety) and, in this overprotective state, amplifies pain messages. Unfortunately, as pain continues, so does impairment in one’s life. As impairment increases and quality of life declines, more strain is placed on the nervous system, which can further exacerbate the pain experience and

perpetuate the cycle of chronic pain. Thus, chronic pain can persist after an injury has “healed” and becomes the product of a dysfunctional, complex system that is often associated with significant psychological and social impairment.

In children, the family context is also a particularly important factor to consider.⁹ Children develop within a family system and learn from and react to their family members’ behaviors. Indeed, family interactions, stressors, and pain behaviors can all influence a child’s experience of pain. As a child’s pain continues, it does so within the context of the family environment, which becomes another piece of the complex picture of pediatric chronic pain.

Collectively, we now know that children are at risk for experiencing chronic pain, and understanding, diagnosing, and treating a child in pain cannot solely rely on a biomedical approach. Limited understanding of the complex, biopsychosocial nature of pediatric chronic pain is likely to result in ineffective and potentially harmful treatment. Poorly treated chronic pain gets worse with time and becomes harder to treat. Thus, identifying and treating pain in children is a key component to addressing the current pain and opioid epidemic in our country.



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What we know about pediatric chronic pain treatment:

It was not too long ago that infants did not receive anesthesia or pain management as scientists and physicians questioned whether infants even experienced pain at all. Fortunately, after decades of pediatric pain research, we now know that: 1) humans of all ages experience pain, 2) poorly managed pediatric pain increases the risk for chronic pain into adulthood, and 3) effective pain treatment includes a combination of biomedical, psychosocial, physical rehabilitation, and complementary modalities. Although the first point is now widely accepted, education, funding and policy to address points 2 and 3 are lacking.

Given what we know about pediatric pain, it should be no surprise that strictly biomedical approaches are not

effective. As described above, pediatric chronic pain is complex and often persists even in the absence of an injury, so solely prescribing a medication that works on one type of nerve receptor (e.g., opioid) and does not address the other mechanisms affecting pain will not relieve chronic pain-related suffering and may in fact cause more harm. Chronic pain is maintained through biopsychosocial mechanisms and needs to be treated with comprehensive pain management that integrates different modalities.

Luckily, many pediatric researchers and providers have developed treatments that are effective and cost saving. Considering that poorly managed pain can snowball into a complex and significantly impairing condition, it is imperative that children and their families have early access to effective pain treatment. Proper management and treatment begins with a biopsychosocial assessment of the child’s pain, which includes consideration for the family context. Once this assessment is complete, treatments targeting specific biopsychosocial aspects of the child’s pain can be initiated.

In 2015, the PAINS Project released an educational brief, *What is Biopsychosocial Pain Care?*,¹⁰ and defined comprehensive pain management as:

Comprehensive pain management is a clinical approach that combines biomedical, psychosocial (some argue including spiritual care) and physical rehabilitation services, including some CAM [complementary and alternative medicine] therapies. It is evidence based, with functional restoration providing the evidence base for this model. Its focus is not on pain scores; its focus is on functionality and wellness. It is individualistic and by definition must be consistent with the patient's goals and values and accepted clinical practice. It is developed through a shared decision-making model. Formulaic, recipe-like approaches do not result in comprehensive pain management.

In children, comprehensive pain management must also involve and engage caregivers and other family members.⁹ Similar to the current healthcare culture, caregivers are often more familiar with the biomedical approach to pain treatment and are often, understandably, overwhelmed with finding and treating a specific cause. Functional restoration is one of the key components of pain management, which means that most caregivers will have to shift their perspective and transition from “emergency mode” to a “return to normal mode” regardless of the pain. Providing family education surrounding the biopsychosocial approach to pediatric pain treatment is often an essential piece of pediatric pain management as it helps caregivers understand this approach to pain management and encourages their participation in treatment.

Examples of effective, evidence-based pain management treatments for pediatric chronic pain are displayed in Figure 1.^{11–15} Comprehensive treatment plans should be tailored to each child's individual needs, include both pharmacological and non-pharmacological approaches, and all treatment planning should be conducted collaboratively with the child and family. Finally, throughout treatment, continued biopsychosocial assessment and family integration are essential (see Figure 1).

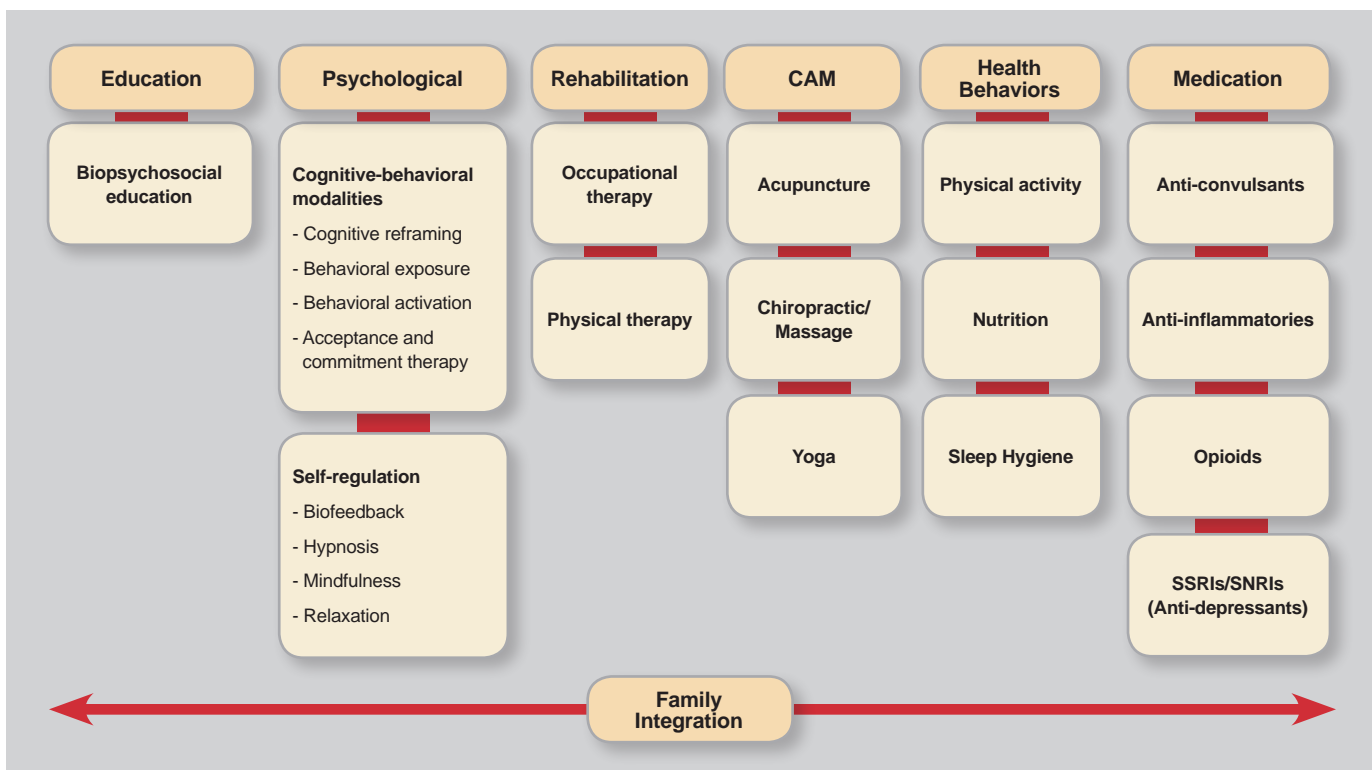


Figure 1. Evidence-based chronic pain treatment

Comprehensive pain management treatments are not only effective in treating pediatric chronic pain and reducing the risk of continued pain into adulthood,¹⁶ but they also save money. Recent findings show that, when compared to usual care, comprehensive treatment of pediatric chronic pain can result in a \$58,000 reduction in healthcare costs and a reduction of \$11,000 in loss from caregivers missing work.¹⁷ In fact, broader research examining the benefit of integrating behavioral health providers into pediatric clinics indicates that behavioral health integration allows physicians to see 42% more patients and collect \$1,142 more revenue per day.^{18,19}

Appropriate management of acute pain can prevent the transition to chronic pain

Given the current state of opioid abuse in our country, a specific discussion surrounding the use of opioids in pediatric pain management is warranted. Indeed, opioids can be effective in relieving acute pain and pain flares in certain conditions (e.g. sickle cell disease, cancer, end-stage disease), but they do not correct and may contribute to nervous system dysfunction in chronic pain. Given that appropriate management of acute pain can prevent the transition to chronic pain, the use of opioids is often indicated and opioids should be provided in such cases. However, opioids are only effective when used appropriately and when provided in the context of continued biopsychosocial assessment and care. Appropriate assessment of pediatric pain will help determine when and if opioids are indicated (i.e., acute injury vs. chronic nonmalignant pain) and will indicate what other interventions (e.g., physical rehabilitation, cognitive-behavioral techniques) are needed. Regardless of how pain presents, given the complex nature of pain and chronic pain, pediatric patients and their families need access to other treatments to prevent the perpetuation of pain and impairment.

We know what works, saves money, makes money, and prevents further problems. So why is there still a problem?

Although there are many factors that prevent children from receiving proper treatment for pain and perpetuating the misuse of opioids, two specific barriers are at the root of the problem:

1. Limited pediatric chronic pain management education
2. Minimal funding and policy directed towards providing comprehensive pediatric pain treatment

Limited education surrounding the nature and development of chronic pain in children is evident in the current healthcare system. A longstanding reliance on the biomedical model and the belief that pain is only caused by an injury has led to the belief that the only way to relieve pain is to remove the injury or repair the damage, which has perpetuated confusion and mismanagement of chronic pain. As stated in the IOM report, *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education and Research*, healthcare providers do not receive adequate training in pain management. In a survey of 104 United States medical schools, only 4 schools required students to take a pain course and only 1 of those schools included pediatric pain management in the curriculum.²⁰ The cumulative number of pain teaching hours across schools ranged from 1 to 31 hours. Thus, depending on how long it takes you to read this brief and whether or not you review the articles referenced, it is likely that you have more knowledge about pediatric pain management than most physicians.

Another key barrier to effective pediatric chronic pain management is a lack of funding and policy directed towards providing care and access to treatment. When children have pain, their caregivers take them to the doctor. Unfortunately, given the statistics stated above, it is likely that the doctor will not know how to properly assess and treat the child's pain, especially if the pain is more persistent and chronic. Even if a child is lucky enough to see a physician who has received some pediatric pain training, it is likely that access to comprehensive treatment will still be limited or nonexistent.

Unfortunately, healthcare and insurance policies have yet to align with the evidence. Currently, most insurance plans will only cover pharmacological treatment for pain (e.g., opioids) regardless of whether or not the prescribed medication is indicated or even potentially harmful. For example, despite safety warnings from the Food and Drug Administration and American Academy of Pediatrics, children continue to receive codeine, which, due to variations in how this type of opioid is metabolized, can result in potentially life-threatening consequences if proper precautions are not in place. In

contrast, even though incorporation of non-pharmacological treatments has been shown to be effective, economical, and can help prevent reliance on potentially addictive medication, these treatments are not readily available to patients and are often not covered by insurance plans.

Comprehensive pediatric pain management treatment clinics or centers are rare. Currently, there are approximately 35 pediatric pain clinics throughout the United States. Current healthcare policy does not mandate or provide funding for the use of comprehensive, non-pharmacological treatments in clinics where chronic pain may be a presenting concern (e.g., pediatric primary care, orthopedics, rheumatology, gastroenterology, neurology, oncology, and hematology), so patients do not have access

to appropriate care. If a child is lucky enough to live close to one of the few pain centers in the country, they are often subject to waiting many months before receiving treatment as result of the high demand for treatment. As children wait for appropriate treatment, their condition will worsen, economic strain on the healthcare system will continue, and they are likely to turn to ineffective and potentially harmful treatments (e.g., unmonitored opioid use).

Funding directed towards 1) research that can further develop and implement comprehensive pediatric chronic pain treatment, 2) development of policies that improve access to comprehensive pediatric chronic pain treatment, and 3) pediatric pain education initiatives will greatly reduce barriers to effective pediatric chronic pain treatment.



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Summary

The economic and societal impact of pediatric pain is significant and yet pediatric pain research, policy development, and treatment are greatly underfunded. Prioritization of comprehensive pediatric pain treatment and allocating funding towards addressing the current opioid epidemic at its root cause are essential.

Policy and funding directed towards current opioid addiction and abuse is needed, but this need will only continue to grow if equal efforts are not directed towards evidence-based, comprehensive treatment of pediatric chronic pain. With this in mind and considering the up to 38% of children suffering from chronic pain, we urge you to review the drafted report from the President's Commission on Combating Drug Addiction and the Opioid Crisis and when you see the words "addiction," "drug," "education," and "treatment," think about a child or adolescent's initial complaint of persistent pain and whether or not the drafted recommendations soothe their suffering and prevent them from ever needing opioid addiction treatment.

Summary of Recommendations

1. Prioritize evidence-based, biopsychosocial assessment and treatment of pediatric chronic pain
2. Develop and enact pediatric chronic pain education initiatives for medical students and healthcare providers
3. Increase targeted private and government funding for continued research on comprehensive, biopsychosocial pediatric pain treatment
4. Mandate insurance coverage for evidence-based comprehensive pediatric pain treatment, which includes physical, psychological, and complementary therapies as well as family-based services
5. Institute policies that require pediatric treatment centers and hospitals to comply with evidence-based pediatric pain assessment and treatment recommendations, which include providing early access to comprehensive pain treatment
6. Incorporate and consult with experts in pediatric pain when developing policy and funding recommendations

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The Pain Action Alliance to Implement a National Strategy (PAINS) is a consortium of leaders from professional societies, patient advocacy organizations, policy groups, consumers, third-party payers and the private sector collaborating to achieve a common vision and mission. PAINS is a program of the Center for Practical Bioethics, a private, nonprofit organization that has a broad-based stream of revenues, including institutional memberships, endowments, grants and contributions from individuals, corporations and foundations (both public and private), and fee-for-service. The Center brings a wealth of experience in coordinating national programs. Its staff includes nationally recognized leaders in chronic pain.

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