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# Models of Care for addressing chronic musculoskeletal pain and health in children and adolescents



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### A B S T R A C T

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Chronic musculoskeletal pain among children and adolescents is common and can negatively affect quality of life. It also represents a high burden on the health system. Effective models of care for addressing the prevention and management of pediatric musculoskeletal pain are imperative. This chapter will address the following key questions:

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- (1) Why are pediatric-specific models of pain care needed?
- (2) What is the burden of chronic musculoskeletal pain among children and adolescents?
- (3) What are the best practice approaches for early identification and prevention of chronic musculoskeletal pain in children and adolescents?
- (4) What are the recommended strategies for clinical management of chronic pain, including pharmacological, physical, psychological and complementary, and alternative approaches?
- (5) What are the most effective strategies for implementing models of pain care across different care settings?
- (6) What are the research priorities to improve models of care for children and adolescents with chronic musculoskeletal pain?

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## Why are pediatric-specific models of pain care needed?

A model of care (MoC) is defined as “an evidence-informed policy or framework that outlines the optimal manner in which condition-specific care should be made available and delivered to consumers.” [1] MoCs bridge the gap between what we know works or does not work in care delivery and practice by describing the “what” and “how” to do it within a health system [1]. A model of service delivery (MoSD), however, converts the principles of a MoC into operational activity and operational recommendations, relevant to the local context. The MoSD acts as a blueprint for the modes of service delivery and evaluation, considering resources, infrastructure, and workforce capacity requirements [1].

Young people (children and adolescents) with chronic musculoskeletal pain (CMP) should not be viewed as “little adults.” The developmental differences among children, adolescents, and adults mean that adult MoCs for CMP cannot simply be applied to pediatrics. CMP is best conceptualized within a biopsychosocial model where pain is influenced by biological/physical factors (e.g., sex, genetic factors, anatomical pathology, and physiological process), psychological factors (e.g., mood, cognitions, and beliefs), environmental factors (e.g., history of parental pain, parent coping and adjustment, school, and socioeconomic factors), and social factors (e.g., peer relationships; see Fig. 1). In each of these domains there are important differences between children and adults. For example, childhood and adolescence is a time of growth of the musculoskeletal (MSK) system with changes to structural properties, biomechanics, and sensorimotor control, before the system stabilizes in adulthood. Similarly, substantial cognitive and emotional developments occur during this time, and hormonal changes regulate mood and emotions differently. Services for young people with CMP need to be sensitive to the issues of growing self-determination and independence, and academic and vocational success, along with physical, psychological, and sexual development. Healthcare providers should have special training to assess and address these developmental needs. Furthermore, the management of young people requires consideration of the complexities commonly at play at this time of life, such as substance use, family dynamics, and mental health issues. Finally, the social relationships, expectations, and environments experienced by children are distinct from those of adults [2]. These differences provide good reasons why specific MoCs are needed for pediatric CMP.

## What is the burden of CMP among children and adolescents?

CMP in children and adolescents is defined as any prolonged pain of a MSK origin that lasts at least 3 months or pain that occurs at least three times in a period of 3 months [3]. CMP in children is the result of a dynamic integration of biological processes, psychological factors, and sociocultural context, considered within a developmental trajectory [3]. The pain may fluctuate in severity, quality, regularity, and predictability. MSK pain can be nociceptive (pain that arises from activation of nociceptors due to actual or threatened damage to nonneural tissue), neuropathic (pain caused by a lesion or disease of

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