



# Physical Activity Among Adolescents with Cerebral Palsy: An Integrative Review

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Received 27 February 2015; revised 27 May 2015; accepted 29 May 2015

## Key words:

Adolescents;  
Cerebral palsy;  
Disability;  
Physical activity

**Problem** Physical activity is necessary for optimum physical and psychosocial health in the general population. It is even more important for adolescents who struggle with impairments that limit motor function. Recommendations for best practice are needed as adolescents transition into adulthood.

**Purpose:** An integrative review was performed to determine the state of the science regarding 1) what factors impact physical activity in adolescents with cerebral palsy, and 2) how the needs of this population have been addressed regarding physical activity.

**Search Strategy:** A literature search of MEDLINE, CINAHL, and PubMed was conducted using the terms cerebral palsy, mobility or activity, and adolescents. Exclusion criteria were surgical or pharmacological interventions.

**Results of the Literature Search:** Descriptive and intervention studies were included and evaluated for purpose, design, and key findings.

**Synthesis of Evidence:** Correcting the decline of physical activity in adolescents with CP may carry benefits over into adulthood. There are few studies that adapt physical activity to age and level of impairment. Several studies support approaching physical activity from a social model, focusing on participation of the person in the context of environment. There is a lack of research incorporating family-centered care. Many study designs are shallow and lack the proper instruments for assessing outcomes.

**Implications for Practice:** Home and community based interventions need to be developed that are individualized. More studies are needed with stronger research designs and better instruments in order to generalize results for practice.

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PHYSICAL ACTIVITY IN adolescence is believed to contribute to the development of healthy adult lifestyles (Hallal, Victora, Azevedo, & Wells, 2006). However, physical activity is often a challenge for youth with cerebral palsy with mobility impairments that limit daily living activities as well as athletic endeavors (Fowler et al., 2007). Beneficial effects of physical activity in non-disabled youth are improved cardiorespiratory fitness, muscular strength and endurance, and reduced body fat. Psychosocial effects include lower anxiety and depression and improved quality of life through better self-management and social

competence (Conchar, Bantjes, Swarts, & Derman, 2014; Maher, Williams, Olds, & Lane, 2007; WHO, 2010). While these attributes may be supportive in helping adolescents in the general population transition to adulthood, little research evidence exists to document the needs or benefits of physical activity in adolescents with cerebral palsy. Likewise, little is known about the effects of physical activity practices on self-management strategies of adolescents with cerebral palsy as they mature.

The following review of the literature was led by the desire to discover research findings to inform best practices that support maturing adolescents transitioning from child-centered to adult-centered health care. Following the guidelines of Whittemore and Knafl (2005), an integrative

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review was the method selected. The exploratory nature of this quest made this type of review more appropriate than a systematic review or meta-analysis. The integrative review can serve a wider range of purposes and can combine data from empirical and theoretical sources. At the same time it must clearly identify the problem and purpose which, for this phenomenon, was exploratory. Supporting the choice for the integrative review are its attributes cited by [Whittemore and Knafl \(2005\)](#), to allow “simultaneous inclusion of experimental and non-experimental research in order to more fully understand a phenomenon of concern.”

### Problem and Purpose of the Review

This integrative review of the literature was designed to determine what is known about physical activity in adolescents with cerebral palsy and how the needs of this population have been addressed. Clinical trials were included in order to assess approaches and interventions. Findings and gaps in the knowledge base are discussed with implications for research and practice.

### Objectives of the Review

The quest for answers to four questions drove the search for literature: 1) What studies are related to physical activity in adolescents with cerebral palsy? 2) What methods are being studied to engage adolescents with cerebral palsy in physical activity? 3) How are parents involved in the adolescent with cerebral palsy’s engagement in physical activity? 4) How can healthcare providers advance the promotion of appropriate and improved physical activity for this population?

### Background of the Underlying Problem

Cerebral palsy is the most common physically-limiting condition seen in children ([Donkervoort, Roebroek, Wiegerink, van der Heijden-Maessen, & Stam, 2006](#)). The condition includes a group of non-progressive disorders that affect motor function and posture resulting from injury to the fetal or infant brain. Even though cerebral palsy is not considered a progressive disorder, adolescents may show a progressive decrease in walking activity and lower levels on the Gross Motor Function Classification as they age ([Bottos, Feliciangeli, Sciuto, Gericke, & Vianello, 2001](#); [Maggs et al., 2011](#); [Palisano, Copeland, & Galuppi, 2007](#)). It has also been observed that teens with cerebral palsy are less physically active than their peers without the disorder ([Brien & Sveistrup, 2011](#); [Nooijen et al., 2014](#)).

The probability of survival into later adulthood has increased for people even with severe levels of cerebral palsy. Barring major comorbidities, actual survival rates are moving toward that of the general population ([Koman, Smith, & Shilt, 2004](#)). Rising odds of survival emphasize the need to address ways to reduce consequences of sedentary life through physical activity. Significant changes in physical function over a lifetime for persons with cerebral palsy

lifetime should not be accepted as a natural part of aging ([Turk, 2009](#)). Effective programs that keep youth physically active as they transition to adult-centered health care may therefore decrease secondary conditions as these individuals age ([Viner, 2008](#)).

Adolescence brings developmental challenges for those with and without disabilities. Beyond the transition from pediatric health care to adult health care, youth typically change from a structured high school environment to more complex college or work environments, and work toward establishing independence from parents. Because the adolescent developmental stage strongly impacts adult lifestyle, it is a critical ideal time to reinforce physical activity interventions ([Nooijen et al., 2014](#)). If adolescents with cerebral palsy are involved in selecting and improving their physical activity, this provides useful skills that may help them as they transition into adulthood. The empowerment that self-management often reinforces can assist them in being an effective partner in the process ([Viner, 2008](#)).

The International Classification of Functioning, Disability, and Health, known as ICF, has refocused the perspective of disability away from “consequence of disease” to a perspective of “components of health” ([Rosenbaum & Stewart, 2004](#)). This view changes the use of negative terminology such as “handicap” to neutral terms like “alteration in physical function.” Following the same line of thinking, the purpose of physical activity can range in meaning from a method to “prevent deterioration in body composition” ([Van den Berg-Emons, Van Baak, Speth, & Saris, 1998](#)) to “engaging children in physical activity to improve a sense of well-being” ([Sakzewski et al., 2012](#)). The ICF also endorses environment and personal participation as important components of health ([Rosenbaum & Stewart, 2004](#)). Because studies with physical activity address the psychosocial domain as well as the physical ([Livingston, Rosenbaum, Russell, & Palisano, 2007](#)) they lend themselves well to interdisciplinary and community-based research that includes personal and environmental aspects of a population to design an intervention. These approaches would work with the adolescents, their families, and communities to identify and meet their health promotion and health care needs ([Binks, Barden, Burke, & Young, 2007](#)).

### The Search Strategy

A computerized search of the literature was conducted using Medline, Cinahl and PubMed databases ([Figure 1](#)). The search was limited to articles in English language with no limitations placed on publication years. Key search terms were cerebral palsy, mobility or activity, and adolescents. Additional searching was done within the references of retrieved articles to add to the findings and to specifically locate randomized clinical trials. Articles related to surgical or pharmacological treatment to improve mobility or physical activity were excluded. After the final screening, thirty-two articles met inclusion criteria and were identified for review.

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