

# Participation in Leisure Activities among Canadian Children with Arthritis. A Wakeup Call for Physicians



Advances in the treatment of juvenile idiopathic arthritis (JIA) have led to improved patient outcomes<sup>1</sup>. Canadian researchers have demonstrated that patients with JIA (except rheumatoid factor-positive polyarticular JIA) have a 70–90% chance of attaining inactive disease by 2 years postdiagnosis<sup>2</sup>. Inactive disease was defined using modified Wallace criteria<sup>3</sup>. They also determined that all but those with polyarthritis have ~50% probability of remission within 5 years of diagnosis. Patients had to demonstrate inactive disease after stopping medication for at least 12 months to be considered in remission<sup>2</sup>.

While achieving such remission is a critical goal, how well does this translate into “good health” overall? The World Health Organization defines “health” as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity<sup>4</sup>. So, are children with JIA healthy?

Research suggests that those affected by JIA are less active and more easily fatigued than many of their peers. They have lower aerobic and anaerobic capacity<sup>5</sup>. Muscle weakness and anemia contribute to reduced fitness, but deconditioning from inadequate physical activity probably plays a greater role. Decreased bone mineral composition is also prevalent, which may relate to disease severity, corticosteroid use, physical inactivity, and poor calcium intake<sup>6</sup>. Patients with JIA participate less in physical education and sports because of disease symptom severity, side effects of treatment, or fears that exercise may worsen their disease<sup>7</sup>. Many with lower extremity arthritis also have impaired balance, which may affect their ability to play sports<sup>8</sup>. Delayed motor development can also affect sport readiness, as has been demonstrated in preschoolers with JIA<sup>9</sup>.

In this issue of *The Journal*, Cavallo and colleagues provide further evidence to support these concepts<sup>10</sup>. They present data from the 2006 Canadian postcensus “Participation and Activity Limitation Survey,” which asked whether a member of the household had a disability that impaired activity at home, work, or school. Persons living on First Nations reserves and children under 5 years of age were

excluded. A telephone-based questionnaire was completed by parents to determine their child’s level of involvement in leisure activities. Researchers looked at diversity of activities and frequency of participation. Leisure behaviors were separated into ones that promoted physical activity (PA) and those that were sedentary. Events promoting PA included formal dance and martial arts lessons as well as coached sports. Other unorganized experiences included sports or other PA without an instructor. Formal non-sport, skill-based undertakings consisted of music or art lessons, and attending clubs and community programs. Sedentary activities comprised television watching, video gaming, Internet use for personal interests, communicating by telephone, and reading.

Cavallo, *et al* also collected positive or negative factors that may have been associated with participation. These included sociodemographic features, disease-related issues (problems with ambulation or using their hands, pain, disease duration, medication use, independence) as well as proximity of community centers and cost of leisure activities. In addition, levels of functional limitation, medication consumption, and use of rehabilitation services were obtained. Multiple linear regression models adjusting for age and gender were used to assess potential associations.

Three percent of 174,810 children who reported a disability had arthritis. Fifty-six percent of parents reported that arthritis restricted their child’s ability to participate in leisure activity. Pain was a limiting factor according to 14% of parents. Ambulatory restrictions and poor hand function inhibited 37% and 34%, respectively. Sedentary behavior was reported in nearly all children daily. Most participated in weekly informal activities of a sedentary nature. Forty percent engaged in non-sport, skill-based activities each week but none partook daily. Factors affecting reduced non-sport skill-based involvement included cost of the activity and the child’s need for assistance. Pain was associated with greater participation in sedentary behavior and informal activities. Lower family income reduced involvement in both sedentary and PA promoting activities. Although 74% participated in unorganized PA and 53%

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played organized sports weekly, only 33% participated in PA daily. Factors associated with more frequent physical activity included adherence to weekly medication administration and easily accessible local recreation facilities.

This study provides considerable data derived from a large population of children with arthritis, which should prove helpful to pediatric rheumatologists. However, there are a few limitations worth mentioning. Parental reports may not accurately represent the child's true disability and adherence to treatment. Surveys tend to overestimate PA participation and cannot accurately quantify the intensity of such PA. The lack of a healthy control population precludes comparing types and frequency of activity. In addition, the cross-sectional nature of this work does not account for disease fluctuation, and factors associated with activity participation cannot be interpreted as causal.

Nonetheless, the findings in this study mirror similar trends occurring in Canadian school-age children without arthritis<sup>11</sup>. Canadian PA guidelines state that 5- to 17-year-olds should accumulate at least 60 minutes of moderate to vigorous PA daily and limit sedentary time to no more than 2 waking hours/day to achieve health benefits<sup>12,13</sup>. The 2012–2013 Canadian Health Measures Survey indicates only 13% (boys) and 6% (girls) meet these guidelines as measured by accelerometry. Children and youth also spend an average of 8 waking hours being sedentary every day. Lower levels of PA and more sedentary time occur with increasing age, especially for girls ([www.statcan.gc.ca/pub/82-625-x/2015001/article/14136-eng.htm](http://www.statcan.gc.ca/pub/82-625-x/2015001/article/14136-eng.htm)). Clearly there is work to be done to improve the health of all Canadian children and youth regardless of ability or disability.

Children with JIA should be encouraged to be physically active because of the many advantages for physical and psychosocial health. At the very least, activity may reduce obesity risks, which can worsen joint load and arthritis outcomes. Participation in aquatic or low-impact land-based weight-bearing exercise programs can occur without disease exacerbation<sup>14</sup>. In addition, such aerobic exercise programs have been shown to improve fitness, muscle strength, self-efficacy, and quality of life as well as decrease pain and disease activity<sup>14</sup>.

Resistance training has also been demonstrated to improve muscle strength, endurance, and function without a significant increase in joint pain<sup>5,15</sup>. Studies show high-level weight-bearing exercise can improve bone mineral density in these children<sup>16</sup>. Anaerobic exercise (e.g., high-intensity interval training) has been shown to increase function and fitness in children with cystic fibrosis and cerebral palsy and could provide similar benefits in those with JIA<sup>5</sup>. Exercises not well studied in JIA include proprioceptive exercises, yoga, and Tai Chi to improve flexibility and balance, but all may emerge as important additional strategies to improve the health of affected children. Importantly, sports participation does not appear to exacerbate disease<sup>17</sup>.

There are a few potential risks that rheumatologists should bear in mind when counseling children with JIA about exercise. They may have increased joint swelling and pain when sports puts an intensive burden on their inflamed joints. However, the full effect of tissue loading on joint surfaces during exercise is unknown. When lower extremity joints are affected, low- to moderate-intensity weight-bearing exercise is generally recommended<sup>18</sup>. Periarticular osteopenia and atrophied muscle around active joints may escalate the risk of fracture. Dental damage is more likely to occur in children with temporomandibular joint arthritis, and those with neck involvement could sustain spinal cord injury, especially when participating in contact sports. Some children with JIA develop uveitis and potential visual impairment, which may increase the risk of eye injury. Cardiovascular complications may occur with exercise should the child or youth suffer from myocarditis or pericarditis (systemic JIA), and aortic root or aortic valve insufficiency in ankylosing spondylitis<sup>19</sup>. Those with longstanding JIA have a greater metabolic demand during exercise and may have difficulties with endurance sports<sup>20</sup>.

The 2002 Exercise and Physical Activity Conference Arthritis Working Group guidelines recommend moderate fitness and strengthening exercises for children with JIA<sup>21</sup>. For health benefits, all school-age children, including those with JIA, should follow the Canadian Physical Activity recommendations<sup>12,13</sup>. The Canadian Pediatric Society and Canadian Academy of Sport and Exercise Medicine have also published the following recommendations in support of regular physical activity for children with arthritis (Table 1)<sup>19</sup>.

*Table 1.* The Canadian Pediatric Society and Canadian Academy of Sport and Exercise Medicine recommendations in support of regular physical activity for children with arthritis. From Philpott, et al. *Paediatr Child Health* 2010;15:213-25<sup>19</sup>; with permission.

#### Recommended Activities

1. Can safely participate in sports without disease exacerbation
2. Should participate in moderate fitness, flexibility, and strengthening exercises
3. Can participate in impact activities and competitive contact sports if their disease is well controlled and they have adequate physical capacity
4. Should be encouraged to be physically active as tolerated. Those with moderate to severe impairment or actively inflamed joints should limit activities within pain limits
5. Should gradually return to full activity following a disease flare
6. Should take individualized training [especially for children with severe joint disease] within a group exercise format for physical/social benefit. Physiotherapists on pediatric rheumatology health care teams should coordinate individual exercise programs
7. Should have radiographic screening for C1–C2 instability before participation in collision/contact sports if they have neck arthritis. If present, further evaluation is required
8. Should wear appropriately fitted mouth guards during activities with jaw and dental injury risk (per general population), especially if they have jaw involvement
9. Should wear appropriate eye protection (per general population) during activities with ocular injury risk

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