

# Do adventure sports have a role in health promotion?

## *Need for objective evidence for a risk-benefit analysis*

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The past 20 years have seen a dramatic shift in the focus of health care, from the intuition and unsystematic clinical judgments of an earlier generation to evidence-based health promotion and treatment.<sup>1</sup> One of the many advantages of this focus on evidence-based practice is that, where possible, emotionally charged decisions have been replaced by careful assessment of risk and benefit, using empirical data. Nowhere is this more obvious than in the field of sport and exercise medicine; there is now strong evidence supporting the prescription of physical activity (PA) for the primary and secondary prevention of many chronic diseases and their associated complications.<sup>2</sup> Like most treatments, no form of PA is completely devoid of risk,<sup>3</sup> but current information suggests that in most situations the risk of PA participation is greatly outweighed by enduring benefits to one's health.<sup>4,5</sup>

Despite this generalization, balancing potential risks with the manifest benefits of PA can sometimes be challenging for the practitioner. Risk in PA is a dynamic construct, such that an activity that is considered to be appropriate for one patient might well be inappropriate for another. The origins of PA-related adverse events can be dichotomized as those which involve traumatic physical injury and those which precipitate an adverse physiologic or pathophysiologic event. To date, many risk-benefit analyses have focused mainly on the latter. The likelihood of adverse events such as myocardial infarction or sudden cardiac arrest has been well managed through pre-exercise screening and a careful PA prescription that balances the immediate risks of the proposed PA against the long-term health risks associated with inactivity.

The dangers of PA are determined in part by the participant's experience, skill, and comprehension of risk; however, unforeseen incidents can occur owing to unanticipated adverse environmental factors. Even an elderly person who uses a walker might hit a lamp-post, trip over a curb, or be hit by a speeding motorist. For the moderate PA practised by much of the general population, such incidents are so infrequent that they do not merit inclusion in the physician's weighing of risk versus benefit. However, the rationale for neglecting the dangers of physical injury is challenged by the recent growth of adventure ("extreme") sports, which can be defined broadly as "individualistic sports containing structural components of real or perceived danger."<sup>6,7</sup> Such activities commonly take place in natural

settings under environmental conditions that expose participants to various types of risk.<sup>8</sup>

### Perceptions

During recent years, there has been a tendency among the young and middle-aged segment of the population to engage in ever more dangerous adventure sports,<sup>9</sup> including mountain biking,<sup>10</sup> mountain trekking,<sup>11,12</sup> snowboarding,<sup>13</sup> skateboarding,<sup>13</sup> surfing,<sup>14</sup> windsurfing,<sup>14</sup> parachuting, bungee jumping, BASE (building, antenna, span, earth) jumping,<sup>15-18</sup> hang-gliding,<sup>19</sup> rock climbing,<sup>20,21</sup> and skiing.<sup>22</sup> According to data from the Sporting Goods Manufacturers Association,<sup>23</sup> a range of adventure sports is now being adopted by millions of North Americans. The growing popularity of such pursuits is also evidenced by television networks' investment in adventure sports programming and their coverage of sports events (eg, X Games).<sup>8</sup> The allure of high risk has apparently been a part of the motivation to participate in adventure sports, within the context of an increasingly safer and less exciting urban environment,<sup>8</sup> while media exposure of such activities stimulates greater participation rates.<sup>15,24</sup>

Given the potentially catastrophic consequences of misadventure, the natural visceral reaction of some physicians has been to recommend avoidance of seemingly "high-risk" sports. As health researchers with an interest in adventure sports,<sup>25-27</sup> we have observed a consistent reaction from many of our peers, clinicians, and trauma specialists who insist that any activity with a substantial potential for traumatic injury *cannot* be health promoting. The emergencies that physicians are inevitably summoned to treat might negatively influence their perspective on the value of such activities. Perhaps a natural maternal and paternal instinct is superimposed on the expression of the cause-and-effect view that if a patient had not participated in a particular high-risk activity, then catastrophic injury could not have occurred. Injuries incurred while engaging in more traditional PA (whether team sports or individual activities such as jogging or leisurely cycling) are regarded as "unfortunate accidents," while injuries resulting from participation in adventure sports are viewed as "foreseeable and foolhardy." However, such reactions stray from both the desired evidence-based model and the clearly enunciated view of the journal *Injury Prevention* that there is no such thing as an "accident."<sup>28</sup> Any "evidence" upon which such conclusions are based is currently

prone to selection bias, as uninjured participants in adventure activities might gain important health benefits but are never seen by the sports physician. Currently, it is extremely difficult to understand incidence of injury or relative risk for adventure sports because participant exposure rates remain largely untracked. For example, recent data from the Whistler Health Care Centre in British Columbia (BC) showed that during a single season of downhill cycling, there were 420 fractures and 101 cases of traumatic brain injury that presented in the clinic<sup>10</sup>; however, investigators were unable to obtain data on the number of participants in these various activities or on the number of injured cyclists who were evacuated to Squamish, BC, or Vancouver, BC. Moreover, because Whistler is a resort municipality, it is likely that many of the mountain bikers were novices, using rental bicycles on unfamiliar territory; data for mountain biking injuries in the neighbouring community of Squamish, where many of the residents are experienced habitual mountain bikers, could be altogether different in terms of incidence and severity.

### Value in risk taking

If adventure sports are, by definition, related to a perceived increase in risk, wherein lies their potential value? Evolutionary theory suggests that humans develop fear as a mechanism to protect themselves against injury until they gain sufficient mastery of a situation to cope with the stimuli that are induced.<sup>29</sup>

A strong case has been made that North American society should stop reconstructing playgrounds for children in an attempt to make them totally “risk free.” If young people believe that they are inadequately challenged by an activity (or play structure), lack of interest and dropout often ensue. Creating risk-free environments deprives youngsters of the opportunity to test themselves while engaging in age-appropriate physical challenges that are motivating and stimulating.<sup>29</sup> The highly successful Outward Bound program is one example of an initiative that offers a meaningful challenge to adolescents in a safe environment.<sup>30</sup> Some degree of risk taking and the development of appropriate risk management tactics are crucial to the full development, engagement, and mental health of the adolescent, and indeed it is likely that such concepts apply across the lifespan. This view is supported by research into the motives of adults who participate in adventure sports; they seek much more than momentary excitement, with objectives that include achieving goals, overcoming fear, escaping boredom, and expanding personal boundaries.<sup>6,31</sup> Enjoyment might also be found in the act of controlling risks appropriately.<sup>31</sup> Like more traditional forms of PA, most adventure sports offer varying degrees of physiologic challenge to both the aerobic and musculoskeletal

systems, thereby reducing the risk of numerous chronic conditions. Such activities could also offer an alternative mode of PA with a likelihood of greater adherence for segments of the population that currently demonstrate a lacklustre participation in traditional forms of PA.

Many facets of our modern lifestyle require us to develop appropriate techniques of risk management. For example, although daily commuting is associated with a large number of automobile- and cycling-related collisions, most of us have adapted to the demands of driving or riding to work regularly. We accept that the risk of city traffic can be reduced by learning and practising good driving skills until we have gained adequate mastery of the urban environment; rarely would a physician suggest that a person injured or killed in a car crash should have anticipated a traffic accident because he or she was engaged in an inherently dangerous activity. The popular portrayal of many adventure sports is of death-defying acrobatics, but most of the athletes concerned are among the elite in their sport and they have mastered the skills necessary to control the potential risks through small incremental challenges in their skills.<sup>32</sup> It is critical that those advising younger and less experienced athletes relay the message that junior competitors might be at greatest risk of injury owing to a poor ability to match their current skill levels against the potential challenges of a given maneuver.

### Conclusion

The current evidence clearly requires that health care professionals encourage patients to engage in regular PA. However, it remains less clear whether a PA prescription should include “risky” adventure sports. In some instances, the risk could well outweigh the benefit, and there is a need for systematic investigation into the typical injury rates in various categories of extreme sports. There is also a need for further analysis of benefit. However, among select segments of the population, adventure sports encourage program adherence and consequently might enhance both mental and physical health more effectively than conventional PA.<sup>33,34</sup> Until clear scientific evidence is available, we should not allow our assessments of risk to be influenced by perceptions, experiences, and biases. Risk taking is inherently human and can be an important factor in personal development. Prudent risk management within the context of one’s environment, skills, and abilities might allow some types of adventure sports activities to become an important component of a healthy lifestyle.<sup>32</sup> The physician who is confronted with a patient who enjoys adventure sports should ensure that the level of risk incurred is consistent with the individual’s skills and experience, and researchers should be encouraged to collect evidence that provides more precise risk-benefit estimates of specific adventure sports activities. 🌿

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#### Competing interests

None declared

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