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COMMENTARY

Lessons Learned from an Outlier

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In this issue of the Health & Fitness Journal of Canada, Brad Zdanivsky provides an insightful look into the life of a person living with spinal cord injury. Over the past five years, I have got to know Brad, and have been continually impressed with his drive and passion for various fields of research. Moreover, his role in promoting the health benefits of physical activity in persons living with spinal cord injury cannot be downplayed. He is a tireless advocate for disability and will examine issues that many clinicians and researchers find too difficult or too risky to tackle.

In reading through his article (Zdanivsky, 2010) entitled "Observations from an Outlier" it became clear that physiologists and clinicians can do a lot more to assist persons living with spinal cord injury. This article, which will certainly spark debate amongst clinical and physiology worlds, provides insight into the pioneering work that Brad is currently doing.

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I would like to preface this commentary by stating that upon arriving to our laboratory Brad challenged openly the clinical and high performance physiologists (myself included) to think outside of the box. He is not one to blindly accept the norm, and openly dares researchers to look beyond their confines. Since working with Brad my research program has moved into areas (such as computer science, engineering, robotics, and hardware design) that simply would not have been possible without Brad's drive to explore unanswered questions and to challenge the status quo.

As established in his article, Brad certainly does not follow the beaten path, and is willing to challenge widely held beliefs. This is evidenced by the fact that Brad was the first tetraplegic to successfully climb (on July 31, 2005) the summit of the Grand Wall of the Stawamus Chief (702 m (2303 ft)). Until this point, it was virtually inconceivable that someone with tetraplegia would attempt such a formidable task. This achievement is truly remarkable, and worthy of the widespread recognition that Brad has received (Wikipedia, 2010).

In our laboratory, Brad discussed candidly the challenges that he faces on a daily basis, and identified areas where little or no research had been conducted. In our discussions, it became clear how much we had to learn from Brad.

LESSONS LEARNED FROM AN OUTLIER

All of our research team, consisting of physicians, clinical and high performance physiologists, undergraduate students, post-doctoral fellows, and graduate students, benefitted greatly from Brad's insight. Through our discussions, Brad made it clear that we also need to challenge what we learned and now teach in our university physiology courses. He showed us how the clinical physiology world had much to learn from other fields, and more importantly from the patient.

Brad is one of the rare individuals who can actually apply his research findings immediately to evaluate its real-world utility. Through these experiences Brad is able to demonstrate directly what does and does not work for someone living with a tetraplegia.

In his article, Brad discusses openly the topic of intentionally inducing autonomic dysreflexia to enhance his exercise performance. This is a very controversial topic for certain, and it is highly unlikely that any clinical exercise physiologist (e.g. CSEP-CEP) or clinician would ever recommend this practice. The health hazards of the topic are well known, and the risks of sudden death are clear (Krassioukov et al., 2009). In his article, Brad pays appropriate attention to the risks associated with autonomic dysreflexia. However, he also highlights how autonomic dysreflexia is part of his every day life, and how when monitored and managed appropriately he can actually make use of this phenomenon to improve his ability to do exercise and complete activities of daily living. For even more controversial discussion on other areas, I recommend highly that you visit his thought provoking website (<http://verticalchallenge.org>).

In our first meetings, Brad challenged me directly regarding whether or not

inducing autonomic dysreflexia was of benefit during exercise conditions. My concerns related to the risks associated with autonomic dysreflexia (despite the potential for improvements in exercise performance). Similarly, at that time I could not imagine a physiologist or clinician willing to examine this experimentally. In fact, I remember meeting with an international leader in spinal cord injury and discussing Brad's line of inquiry. At that time, my colleague simply did not believe that someone would be attempting to do this during his daily life, let alone while rock climbing. However, as shown on Brad's numerous blogs on the topic and his extensive real-time physiological data (please refer to <http://verticalchallenge.org/projects/performance-boosting/>) he has been working on this for sometime with interesting data. The data is so persuasive that it can no longer be ignored.

As someone who is well aware of the risks associated with autonomic dysreflexia I still recommend means of reducing the risk for developing this condition (Krassioukov et al., 2009). I also recommend highly that our patients speak to leaders in the field (such as Dr. Andrei Krassioukov from the International Collaboration on Repair Discoveries). However, I also recognize the important point that Brad is making, and the clear need for further research and a greater understanding of how to manage autonomic dysreflexia when it does occur.

For Brad rock climbing is a very important part of his life, and being able to do so has had a large positive impact upon his overall Quality of Life. One cannot and should not downplay the importance of maintaining a high Quality of Life. There is extensive research indicating that there are many factors,

which determine an optimal health state in persons with spinal cord injury (Warburton et al., 2007). We must always consider health-related Quality of Life of essential importance.

Through his experiences Brad has realized that there are means to get around his neurological limits to allow him to pursue his favourite pastime, and in turn, enhance his mood state and Quality of Life. Moreover, Brad understands as well as any person that a clearer understanding of the management of autonomic dysreflexia is necessary in tetraplegics because of the high incidence of this phenomenon in daily living, and the relatively limited knowledge of the condition.

I ask each clinician and physiologist to give serious consideration to Brad's assertions. Too often we find it easy to disregard controversial theories of this nature. This is the safest way from a variety of perspectives, and was my first response when I heard what Brad was proposing. However, as he so eloquently argued this may not be the best way, particularly for someone living with tetraplegia. It is these sorts of stimulating debates that lead to major breakthroughs.

The theory of inducing autonomic dysreflexia to improve performance is not a new one, and anecdotal (Bhambhani et al., 2009) and experimental (Burnham et al., 1994) evidence (particularly from high performance sport) indicates that many persons living with tetraplegia are attempting this practice with limited knowledge and/or medical supervision. This creates a potentially very dangerous situation. Clearly, further investigation is warranted to improve our understanding and reduce the risk to persons living with tetraplegia.

Brad's thought provoking article will certainly generate controversy and

conversation in the field. However, it is important to further highlight that his article has been created with measured consideration. Brad knows all too well his physiological limits and the potentially lethal complications associated with autonomic dysreflexia. This is clearly shown on his website where he states:

“Please be safe, and remember that I have a small pharmacy and devices to measure with. You should not be messing with boosting if you have not discussed it at length with a specialist — and that Doctor should tell you “No”!”

In conclusion, the pictures of Brad climbing speak for themselves, demonstrating his ingenuity, innovation, and desire to push the boundaries of human existence. It is hoped that Brad's article will serve as a foundation upon which other research is conducted in an attempt to gain a greater understanding of autonomic dysreflexia and in turn reduce the risks associated with this potentially lethal condition.

Qualifications

Darren Warburton's qualifications include: PhD, MSc, CSEP-CEP, CSEP-CPT ME.

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Editor's Notes

This commentary was peer-reviewed.