Can you describe your current research interests and how your professional experience informed your work in this area?

I have worked as an exercise physiologist since 1985. During this time, I have been involved in alpine ski racing and travelled with many national sports teams, including the Canadian women's ice hockey team. Over the course of my travels I was often confronted with anterior cruciate ligament (ACL) ruptures. Interestingly, when I was with the national women's ice hockey team, I found that when the players were treated for injuries, they were able to tolerate pain much better than their non-athletic counterparts. This observation lead to this study, which was designed to capture and analyse the female experience in sport and exercise from the perspective of both athletes and exercise participants.

What inspired your early interest in this field?

The first time I worked in this area was during my undergraduate degree at the University of Victoria in British Columbia, Canada, under Dr Norgrove Penny in 1981. I conducted a pilot research project for him using the KT-1000 arthrometer and Cybex dynamometer. We measured knee laxity in the University's female basketball team after a series of ACL injuries had occurred. We implemented a preventive exercise regimen, which involved isokinetic strength training with the Cybex and, promisingly, in that year there were no new ACL ruptures. In the back of mind, I always wanted to return to this area of my undergraduate research.

Can you outline your current activities, and those of your research group?

We have just completed the study investigating exercise and osteoarthritis in women and sport, funded by the Social Sciences and Humanities Research Council (SSHRC) and the Sport Science Association of Alberta. I was the Principal Investigator on this study and it involved undergraduate and graduate students investigating sport-related knee injuries in women, as well as their awareness of osteoarthritis.

I also sit on the PhD committee of Matt Jordan, who is investigating long-term effects of knee injury on neuromuscular performance and function in elite and sub-elite alpine ski racers. Finally, I am a collaborator and co-investigator on two projects in Dr Carolyn Emery’s lab, the Sport Injury Prevention Research Centre. One is a curriculum-based neuromuscular training programme examining the effectiveness of reducing the risk of sport and recreational injuries in junior high school students; the other is exploring the consequences of knee joint injury in youth sport and the implications for osteoarthritis and other health outcomes. In my lab we are also conducting research on blood biomarkers associated with vaccines and obesity.

What major obstacles have you faced over the course of your career?

There are two main challenges. The first is training individuals to do qualitative work as it is highly time consuming and requires learning to use an NVivo software programme. The second is that recruiting participants for studies can be difficult and it always takes longer than anticipated.

How important was the mentoring aspect of your research to achieving your goals?

The mentoring process was a necessary aspect for this grant to go forward, since the social sciences terminology and qualitative research techniques were not originally in my area of expertise. To this end, we brought in an expert to give a one-day workshop: Dr Markula Pirkko, a skilled qualitative researcher from the University of Alberta. Furthermore, I always encourage my students to research areas that they are passionate about. For example, two undergraduates – Kristen Lawrence, a former soccer player, and Erin Collins, a former alpine ski racer – both completed mini projects with athletes from their sports. Although working with undergraduate students can be labour-intensive, it is highly rewarding for all concerned. The work of these two students contributed to the exercise background, injury and sport participation histories and the students gained invaluable experience and expertise in qualitative research.

To finish, could you outline some of your findings from the in-depth interviews and focus groups you conducted?

The findings from our research are illuminating. For example, we found that women were often left to their own devices to find the professionals that could assist them to regain their full range of motion and return to physical exercise. Most physicians and surgeons advised the women to exercise and, in some cases, to lose weight; but only in very few cases were the women referred to physiotherapists or to exercise professionals that could assist them in doing this.
A physical focus

Operating on the basis that prevention is better than cure, the Doyle-Baker Laboratory in the University of Calgary has conducted an important and illuminating project on the perspectives of women returning to sport after sustaining a damaging knee injury.

REGULAR PHYSICAL ACTIVITY is an important part of any healthy lifestyle. However, there are clear gender differences regarding participation in physical activity; in Canada, for example, females are more inactive than males across all age groups. Moreover, females who are physically active have a much greater risk of sustaining a knee ligament injury – such as an anterior cruciate ligament (ACL) rupture – than their male counterparts. Unfortunately, more than half of ACL ruptures lead to osteoarthritis one to two decades post-injury, which, as the most common form of joint disease, causes intense pain and stiffness. Although physical exercise is a key element of arthritis prevention and management, research has shown that women with osteoarthritis are unlikely to meet physical activity recommendations.

There is therefore an urgent need to explore the reasons that underpin the higher levels of inactivity among women both with and without arthritis – and it is from this context that Dr Patricia Doyle-Baker’s recent research project emerged. As Associate Professor in the University of Calgary’s Faculty of Kinesiology, Doyle-Baker’s expertise lies in preventive medicine, clinical exercise physiology and epidemiology. She is fascinated by the role of therapeutic exercise in managing the pain associated with knee osteoarthritis – a fascination that grew after she began to play ice hockey herself aged 45 and subsequently realised that there was a population of individuals with post-ACL rupture knee osteoarthritis who continued to exercise and participate in sports. These women are passionate about sport and where there is passion, there is purpose.

In response, Doyle-Baker’s recent study focused on capturing and analysing the female experience in sport and exercise from the respective viewpoints of athletes and non-athletes. Leading a research team comprised of undergraduate and graduate students, she sought to understand why certain women with ACL knee injuries were able to return to sport while others were not. Importantly, the study moved beyond quantitative methods, involving interviews and focus groups with the study participants and using their answers to forge deep insights into their practices, beliefs and concerns regarding the place of sport in their lives.

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In their study, Doyle-Baker and her team made some important insights into why women – particularly those with osteoarthritis – often fail to adhere to physical activity programmes. For example, semi-structured interviews with midlife women who were not elite athletes revealed that their self-confidence was inhibited following injury and that they received little advice and information from their physicians regarding the practicalities of therapeutic exercise.

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Interviews were also conducted with young female soccer and basketball players and with competitive female alpine racers who had returned to skiing after sustaining an ACL injury. The findings from these studies provide a vital knowledge base about the perspectives of female athletes on ACL injury. For example, the skiers felt that reconstructive surgery on their ruptured ACLs was the only way to get better and ski again. Although none of the participants were told not to have surgery, the consensus was that surgery was needed to return to high levels of activity in physically demanding sports. That some athletes view surgery as a preventive measure was the team’s most enlightening discovery. “Identifying why some women do adhere to physical activity programmes while others do not, even in the presence of debilitating diseases, can aid in the development of more gender-specific and successful adherence strategies – strategies which are critical to their long-term health and reduction of disease,” summarises Doyle-Baker.

The rich data obtained from the team’s interviews were analysed using conventional content analysis through an inductive approach. Each
EXERCISE AND OSTEOARTHRITIS: UNDERSTANDING THE CONTEXTS OF WOMEN THROUGH SPORT

OBJECTIVES

The goal of the study was to understand an anterior cruciate ligament injury experience. The team initially focused on women who have maintained a high degree of physical activity despite the challenges of degenerative joint disease, followed by young female athletes recovering from an injury and attending a rehabilitation clinic.

KEY COLLABORATORS

Co-PI: Lynn Meadows, PhD, MSc • Research Assistant: Jane Stewart (MSc) • Students: Erin Collins; Kristen Lawrance; Jodi Nettleton

PARTNERS

Matt Jordan (PhD Candidate), Director of Sport Science Alpine Canada • Carolyn Emery, PhD, PT, Co-Chair of Sport Injury Prevention Research Centre, Faculty of Kinesiology • Ann Flynn, MA, Faculties of Kinesiology and Fine Arts, University of Calgary, Alberta, Canada

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interview was transcribed and read carefully, allowing the researcher to obtain a complete picture of the issue – namely, why women return to sport following injury – without imposing any preconceived notions: “Exact words and phrases are then highlighted and summarised to capture thoughts and concepts that are key to the data,” Doyle-Baker explains. “Next, the researcher looks for similarities in words and with the help of the NVivo software, these are categorised into various codes that are later linked together into meaningful clusters, ideally between 10 and 15.” By consolidating the data into codes, the team was able to develop and define reoccurring themes. Importantly, the students all had the opportunity to hear the opinions, perspectives and experiences of the athletes and non-athletes, as well as quantify physical activity and short- and long-term outcomes through the Knee injury and Osteoarthritis Outcome Score (KOOS).

At present, Doyle-Baker and her colleagues are working to publish more of their completed research on exercise, knee osteoarthritis and injury in the context of young women in sport. Going forwards, the team is primarily concerned with driving the concept of prevention, which their project highlights as a vital component of reducing the risk of knee injury and of improving the confidence of females so that they continue to exercise. “This is where policy comes to the forefront, as we need to advocate for daily physical education in schools, as well as for qualified physical education instructors at the elementary levels,” Doyle-Baker asserts. “Additionally, programmes such as neuromuscular training (NMT) should be widely disseminated across all sports and recreational activities among the young and old alike.”

Improving health with exercise

Doyle-Baker and her team strongly advocate that physicians should prescribe exercise as a treatment regimen to those with osteoarthritis. To this end, the researchers are focusing on developing both targeted and general strategies to improve the long-term health of women and the reduction of diseases such as arthritis:

- They have created a manual – How to exercise with arthritis – for use among individuals with arthritis and a module – Exercise and Joint Mobility – for use among fitness leaders
- They are investigating physicians’ perspectives of exercise specialists in primary care networks, and are currently preparing to survey the knowledge, perceptions and attitudes of general practitioners towards the promotion of exercise and physical activity

The Doyle-Baker group has also summarised its research with several clinical recommendations:

- Both medical professionals and patients must strive towards building relationships and a shared decision-making process. This will assist patients in feeling respected when they voice their fear of knee re-injury or dealing with pain
- Physicians should help patients to become more autonomous by helping them to increase their knowledge about injury and rehabilitation, along with helping them to set short-term health goals
- Exercise and rehabilitation programmes should be personalised depending on the chosen sport of the individual in question
- Physicians should speak to their patients about the future risk towards osteoarthritis after a knee injury. This information may help motivate the patient to stay physically active over the long term