

Foreword

Imagine that you are sitting at home on a Saturday night and have just tuned in to the hockey game. What do you see? Mats Sundin skating at break-neck speed? Fancy footwork and a great move to elude a defensive player? A powerful slap shot that finds the top corner of the net? A triumphant waving of arms and sticks as players celebrate a goal? Perhaps you even notice the crowd cheering, the head coach appearing just a little more at ease, or the opposing team offering encouragement to their goalie.

The more you watch, the more you appreciate the remarkable amount of action that follows every goal that a player scores. While that may be obvious, something even more remarkable is perhaps less obvious. Although trophies, records, and titles may be the simple goals of any hockey player, what goes on inside an athlete such as Wayne Gretzky is much more complex and fascinating than meets the eye.

The mark of any champion may be found in his or her perseverance and dedication to training for excellence. Whether this means winning a medal, or struggling through adversity to reach an individual or team goal, victory comes with a price. Take NHL player Grant Marshall as an example. In 1990, he broke his neck in a junior game and was not expected to realize his dream of playing in the NHL. But Marshall defied the odds – and just helped the New Jersey Devils win the Stanley Cup. Most hockey fans are familiar with Gretzky's dedicated training regimen. As a young boy, he practiced shooting pucks in his backyard for hours every day. But how did this very basic exercise contribute to his outstanding ability on the ice? How did such simple drills maintain and improve his skill level throughout the crucial stages of growth and development?

And who can forget the courageous effort of Silken Laumann, who, after sustaining a serious leg injury just prior to the 1992 Olympics, showed the world that hard work and determination (and a lot of skill) can pay off. Not only did this Canadian rowing champion complete her race,

she also succeeded in securing a bronze medal just months after the injury many thought would prevent her from even walking again and possibly crush her Olympic dream.

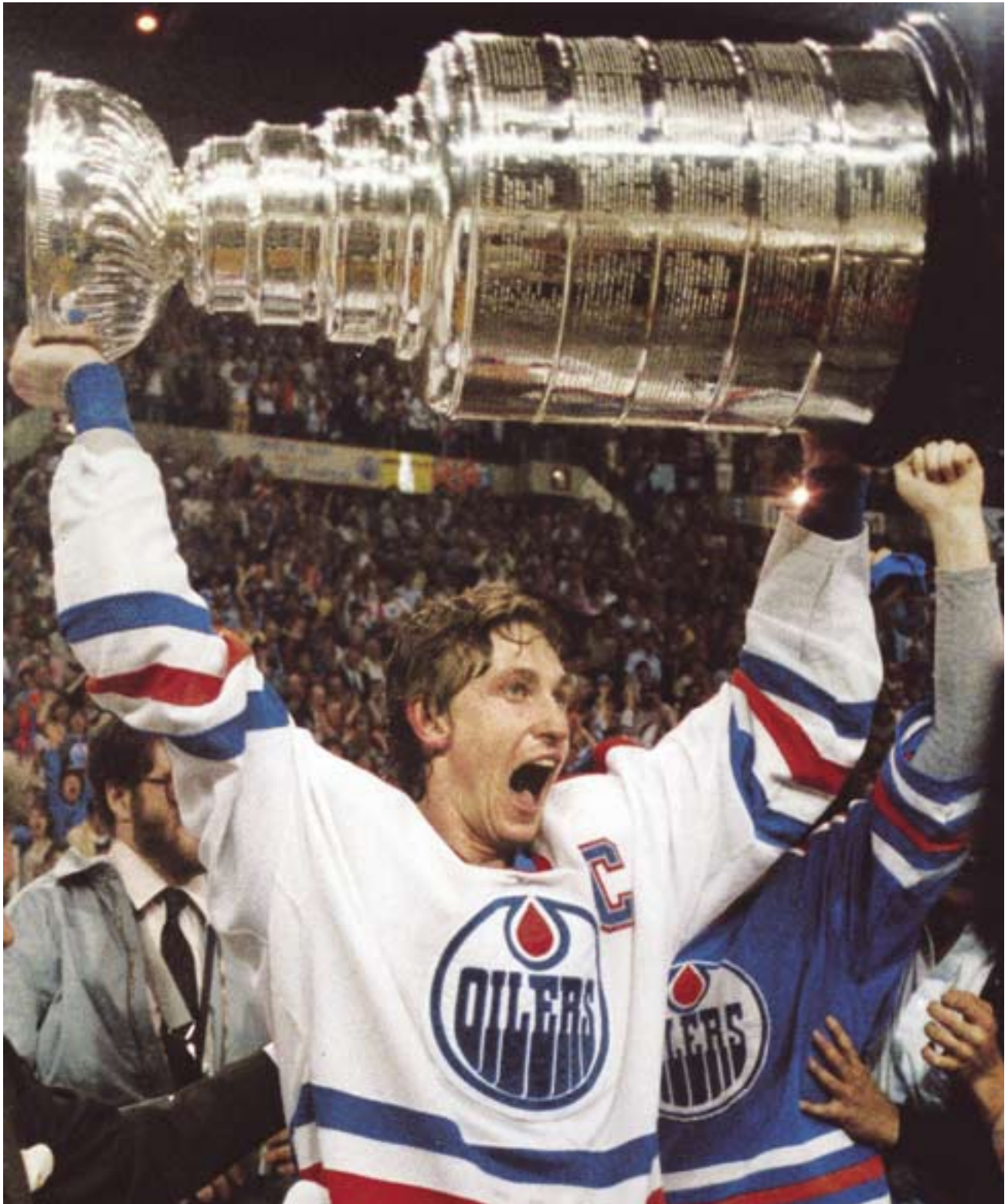
What was going on within Silken's body as she gracefully powered her boat through the water? How did she ensure that she had enough energy to last the entire length of the course? Are we all capable of that level of endurance, or did Laumann possess a unique supernatural trait? And where did she find the energy to pace herself for a race?

This raises a range of other questions – where did this energy come from? Was it derived from the food she ate? How did her body store and allocate energy to support long, tiring races and short sprints for the finish that require quick and powerful bursts of energy?

Successful performances also require some degree of muscular training. What muscles did Gretzky develop to make him a fast and aggressive skater? Do these muscles bear unusually large amounts of stress? Hockey players are particularly prone to knee and back injuries; what is it about the sport that makes its athletes so vulnerable? Do drugs or treatments exist that may prevent such mishaps?

And while we are on the topic of drugs, how do steroids and other substances influence athletic performance? Does an athlete's requirements for training change with drug use? What is the best way to train? It seems that Gretzky devoted his entire childhood to becoming arguably the best hockey player in the world. Could he have achieved the same results using a different training regimen?

Then again, maybe an athlete's ability has little to do with years of practice. Certain laws of physics can be applied to sport, so it may be that Laumann knew something about hydrodynamics that gave her a competitive advantage. Maybe she understood the proper technique required to maximize speed in the water while minimizing drag. After all, principles of biomechanics have



Known as “The Great One,” Wayne Gretzky had fun as the whole world watched him become a household name in Canada and around the world. Born in Brantford, Ontario, in 1961, Wayne went on to dominate and re-write the NHL hockey record books. With four Stanley Cups, a career 1,016 goals, 2,223 assists, 3,239 points (including playoffs), and an Olympic gold medal as the executive director of the Canadian Olympic hockey team, Wayne Gretzky is a proven winner. He remains a true Canadian sports hero.

been used by sports scientists for many years in areas such as gymnastics, pole vaulting, and cycling.

In a league full of talented players, how did Gretzky manage to win so many face-offs? Was it remarkable reflexes that he was lucky enough to be born with, or did he have to develop this ability? If you analyze one of Gretzky's face-offs on tape, it appears as though he is actually moving before the referee drops the puck.

As an outstanding individual player, Gretzky's talents were not limited to his phenomenal physical skills: he was also a master of strategy. It is one thing to score the most goals in a season, but quite another to also lead the league in assists. Just imagine trying to set up your teammates for a goal every time you step out onto the ice. You must always be thinking one move ahead of the opposition in order to orchestrate a successful play. What went on in that brilliant mind that was always conscious of every player on the ice? Did Gretzky ever get nervous or lose his focus?

There must be days when athletes just don't feel like they can perform up to their potential. Every athlete is prone to such doubts over a career. But how was Laumann able to stay motivated to train and return to form for the Olympic Games after a devastating injury? What did it take to remain competitive year after year with the same focus and drive? How did Gretzky rise to the occasion in a big game, while others wilt under the pressure? With the salaries that many professionals are bringing in these days, the motivation to perform might be found in their back pockets.

When you review the number of games Gretzky played in a season, year after year, with different teams and different teammates, the questions arise: How did he stay "up" for every game? Did he ever relax and perform only marginally? What made the difference? And did Laumann have personality characteristics that allowed her to endure more pain than the average person? Rowing has one of the highest $\dot{V}O_2$ max levels of any sport – top competitors must develop a high training capacity and also a high threshold of pain. Did this experience and years of training

help her endure and overcome a devastating injury that would have ended the career of most athletes?

What made the difference with these two athletes? These personality characteristics certainly helped both rise to stardom in their respective sports – time after time they excelled against the best competitors the world could offer. What made the difference? Was it because they could afford the best coaches, trainers, and equipment?

This brings up the issue of money. Where do astronomical sums of cash fit into the broader picture of sport? Do large salaries make players excessively greedy, to the point that they are willing to strike, risking the loss of an entire season of play? Does this change how the fans perceive players? Does this aspect detract from the beauty and tradition of sport by placing it in the hands of capitalism and big business?

And speaking of fans, how do we, as spectators, view sport, and how does it affect our lives? Every Canadian has certainly had some degree of exposure to hockey, rowing, and other sports. Increasingly, as women and minorities seek the opportunity to play, and citizens' coalitions band together to prevent televised violence, sport has become a focus of political and social issues.

As you can see, a single glimpse into the world of sport can generate discussion over a variety of subjects. And that, specifically, is the purpose of this textbook. The chapters that follow expose you to a variety of perspectives associated with physical and health education. You are most likely familiar with the sporting and physical activity aspects of PHE courses; however, this course is designed to provide a unique opportunity for students to apply sports-related ideas to associated areas including medicine, sociology, physics, and business.

With the expansion of your knowledge in this area, you should be motivated to strive for a higher quality of life through your own level of physical fitness. Rather than simply telling you that healthy living is desirable, we will show you why. For this reason, the following chapters are structured so that you have the opportunity to apply the knowledge you learn.



Ten weeks before the 1992 Olympics, Silken Laumann suffered a severe leg injury during training. She made a remarkable recovery and went on to win a bronze medal at those Games. She also won a bronze medal at the 1984 Olympics, a silver medal at the 1996 Olympics, and was a world champion in 1991. Silken Laumann is a model for many athletes: she believed in herself and refused to give up, triumphing in the end against all odds to become a household name in rowing in Canada and around the world.