

Keep your eyes on the puck

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It happens every night in professional hockey, usually followed by the disbelieving cry of: "How did he save that?" Researchers at the University of Calgary's Faculty of Kinesiology may have found the secret to dazzling goaltending, after they discovered the exact spot a goalie needs to watch to be successful.

Graduate student Derek Panchuk and professor Joan Vickers, who discovered the Quiet Eye phenomenon, have just completed the most comprehensive, on-ice hockey study to determine where elite goalies focus their eyes in order to make a save.

Simply put, they found that goalies should keep their eyes on the puck. In an article to be published in the journal *Human Movement Science*, Panchuk and Vickers discovered that the best goaltenders rest their gaze directly on the puck and shooter's stick almost a full second before the shot is released. When they do that they make the save over 75 per cent of the time.

"Looking at the puck seems fairly obvious," Panchuk said, "until you look at the eye movements of novice goaltenders, who scatter their gaze all over the place and have a much lower save percentage than the elite goalies."

The findings also contradict some research out of Europe which suggests that soccer goalies concentrate on the non-shooting foot of the kicker to make the save.

The Quiet Eye has been Joan Vickers' life work. She discovered it first in golf (where she has worked with the PGA) and continued her research in several other sports. Vickers describes the Quiet Eye as a critical moment that occurs in every sport-- the moment where the eyes must receive and the brain must process the last piece of visual information before you perform the final critical movement such as putting, shooting a basket, serving, or in this case making a save.

To accurately track eye movements and gaze duration in a sport, Vickers' neuromuscular lab continues to pioneer both technology and research. Their latest invention is wireless headgear that has cameras recording the movements of the athletes' eyes, as well as what they're looking at. The Vision in Action system allows researchers to precisely record an athlete's eye movements, body movements and objects (like a puck) to within 16.67 milliseconds.

"I think this research is exciting because it's new information that can be immediately incorporated into a goalie's game with the proper training," Vickers said. "Our previous experience tells us that if athletes incorporate what we've learned in Quiet Eye studies, they can improve in their sport – even if they are already at an elite level."

In the case of the National Hockey League, it's easy to see how goalies could benefit. Panchuk's study featured shooters taking unobstructed shots on goaltenders from close distances, closely mimicking the NHL's shootout procedure that decides tied games. Panchuk's study shows that the distance of the shot doesn't seem to matter, as long as goalies concentrates their gaze on the puck and stick in the critical second before it's released.

"Goalies often focus on physical things like improving technique but they over-look the decision-making – the cognitive side of things," Panchuk said. "I think this study shows that you also need to focus on

your decision-making and your thinking processes. Having optimal focus is just as important as being in optimal physical shape."

Panchuk plans to continue the study by moving from wrist shots to slapshots and penalty shots, where the goalie has even less time to react and make a save.

Source: University of Calgary

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