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Butterfly effect: Keeping goalies healthy

Tuesday, the Wild devoted a large chunk of practice to chewing up the offensive zone. The theme: Get more shots on net.

Niklas Backstrom, less than two years removed from left hip surgery to repair a torn labrum, and less than one month removed from fearing he tore it again, was the guinea pig.

The goaltender fell into his butterfly position, which is meant to take away the low part of the net, over and over again.

Up and down. Up and down. Slide left, slide right.

Dripping with sweat, Backstrom finally got a rest. In came Jose Theodore, less than a month removed from his hip injury.

Up and down. Up and down. Left, right.

"How many times do you think we do that? Two hundred, three hundred times a day?" Theodore asked. "With the butterfly, you feel the stress in your hips."

Multiply that daily grind over the course of

the season, and the wear and tear on those hips is enormous.

If anybody knows this, it's the Wild. Two years ago, Backstrom underwent surgery for a torn labrum. Last season, it was Josh Harding's turn. Luckily, Theodore's recent problem was only a strain.

Last month, Alex Kangas' career at the University of Minnesota ended prematurely because of a torn labrum. In recent years, NHL goalies Jean-Sebastien Giguere, Rick DiPietro, Ray Emery, Vesa Toskala, Antero Niittymaki, Craig Anderson and, of course, Patrick Roy -- to name a few -- all suffered hip injuries that required surgery.

Is it an epidemic caused by the butterfly?

Yes and no, doctors say.

Marc Philippon of the Steadman Clinic in Vail, Colo., has repaired more than 5,000 labral tears, including 700 on pro and Olympic athletes. Vikings doctor Chris Larson of Minnesota Orthopedic Sports Medicine Institute at Twin Cities Orthopedics has performed 1,700 of these surgeries, now averaging 350 to 400 a year.

Both agree, as Philippon says, "the butterfly

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style puts the hip at risk."

But the surgeons also say it's uncommon to have a labral tear without an underlying hip problem called femoroacetabular impingement (FAI), in short an abnormality where the ball and socket of the joint don't match.

"Imagine trying to make something that's not perfectly round fit in a socket," said Philippon, who has operated on such star athletes as Mario Lemieux, Alex Rodriguez, Marian Gaborik, Paul Kariya and Dino Ciccarelli. "If you force it in, it's going to cause friction. That's what's happening with these goalies."

FAI affects 15 to 20 percent of people, Philippon believes. Philippon operated on Backstrom and Harding and says they were just two of the unlucky ones.

"When you do the butterfly multiple times, it's an awkward goalie geometry that puts a lot of stress on the hip," said Philippon, a former hockey and soccer player. "Now, if you have the impingement, your muscles will overwork to make the hip fit properly, causing a damaged labrum."

Both doctors are reluctant to say there's an

upswing in hip injuries by professional athletes. There are simply better diagnostic tools to identify the injury today.

"In the past, when we did not have the technology or understanding to deal with these injuries, athletes either struggled through their careers or ended them prematurely," said Larson, who operated on Wild forward Guillaume Latendresse's torn labrum in November.

Goalie styles evolve

The butterfly style has evolved dramatically in the past 25 years. Slowly, the stand-up goalie of the past began to make way for more of a hybrid style, like that of John Vanbiesbrouck, who retired in 2002 as the NHL's winningest U.S.-born goalie with 374 regular-season wins.

"We didn't do half butterfly pushes," Vanbiesbrouck said. "When we went down to the butterfly, we got up in full recovery."

"Now guys are doing a half recovery style where you see them maintain the half butterfly and use that leg to kick to the post."

As former NHL goalie Kay Whitmore, a hockey operations manager with the NHL,

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says, the butterfly has transformed from a safe choice to stop a low shot headed for the corner or between the legs to an actual style now.

"It [used to be] one of the weapons you had in your arsenal to make a save," Whitmore said. "You see some goaltenders now, they can stay down there for a minute or two on the power play."

The butterfly style has created an evolution in pads. Years ago, goalies wore heavier, shorter leg pads filled with deer hair wrapped tightly around the legs.

Today, goalies wear long, foam pads and wear them loose so they rotate with the leg.

Whitmore thinks that's the reason for a lot of hip injuries. "Sometimes your leg wants to do one thing and your stiff board-like pad wants to do another, so they're almost working against each other," he said.

"Yeah, you're having success, you're sealing the ice better, you're closing your five-hole better, but you're paying the price."

Are pad changes to blame?

Backstrom is aware the butterfly puts stress

on his hips. He knows he had the impingement Philippon refers to.

But he also blames his hip injury, at least in part, on the NHL's reduction in size of goalie equipment since the lockout.

In 2005-06, the inner knee padding was altered to not exceed 2 1/2 inches. But companies were figuring out ways of making the knee lifts 3, 3 1/2 inches by using soft foam, Whitmore says. Skaters began to again complain that goalies were not only dropping down faster, the thick padding was allowing them to sit higher while still sealing the five-hole.

So in 2008-09, the league began measuring the 2 1/2-inch thickness noncompressed, forcing companies to essentially remove an inch flap of padding, goalies say.

"Now you go down to your butterfly, and your knees are lower to the ice, so your ankles are higher than your knees and putting a lot of stress on the inside of your knees and hips. That's even what the doctors told me," Backstrom said.

Whitmore points out that when all the rule changes were made to streamline goalie equipment, it was done in consultation with

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the NHL Players' Association.

"We're as much about safety as the players themselves," Whitmore said. "I answer to 30 general managers with all the equipment that have a lot of money invested in these No. 1 goaltenders and the success of their franchises ride on it.

"We hear occasionally that there's a concern. But I also hear it the other way. ... For every guy that complains, there's a bunch of guys in the same union saying, 'Guys are circumventing the rules.'"

Surgery is a new beginning

While the butterfly's here to stay, Vanbiesbrouck said, "There is no right way or wrong way to play goal. ... [The butterfly] is just another innovation within the artwork of goaltending."

And as long as goalies know surgery can repair a problem, they won't be scared off from playing the butterfly. In fact, goalies who have labral surgery actually say they feel more flexible.

"My rotation is much better now on my left side than the right," Backstrom said.

"There's no better example than [Boston's] Tim Thomas," Vanbiesbrouck said. "He had the surgery last year and he's the best goalie in the league this year. Years ago, you had hip surgery, no team would want to touch the guy. You're damaged goods. Now you come back and you're better than before."

But Whitmore said, laughing, if you have hip pain, "There's options, like you don't have to butterfly. ... Everyone thought the butterfly was a boon to the goalies, but no one ever looked at the long-term ramifications of how well you'll walk at 50 or 55 or if you'll need surgery like these guys."

Vanbiesbrouck agrees.

"Tell all these guys to stand up a little bit more," he said, laughing.

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