

The rising popularity of the “butterfly” position in amateur hockey may be attributed to its success in the National Hockey League (NHL).^{1,2} The position carries potential risk for injury in youth hockey players as femoroacetabular impingement (FAI) is thought to be derived from repetitive microtrauma which may be incurred in the position. Even in asymptomatic youth hockey players, FAI deformities are prevalent and suggest a reactionary bone formation not seen in other youth athletes.³ The research into the effects of the position is still limited despite high profile reporting of the position’s risk in *Sports Illustrated*²; however, widespread concerns for butterfly position related injuries in amateur to professional hockey have appeared in the lay press.⁴⁻⁸

The “butterfly” position is a technique that was heavily popularized by Patrick Roy’s success.¹ The technique encourages goalies to increase their internal rotation of their hips and place the knees in valgus to lower the player’s center of gravity closer to the ice while maintaining a protective spread. When assuming the butterfly position, hockey goalies may often exceed their physiologic internal rotation.⁹ Supraphysiologic internal rotation and knee valgus can increase the injury risk.^{10,11}

Hockey goalies are known to have an increased rate of hip injuries in the NHL. A recent report of NHL players reported the odds risk for injury was 1.68 (95% CI: 1.18 – 2.38) as a goalie compared to position player.¹¹ A prevalence study performed between 2006–2010 in the NHL identified 1.84 injuries per 1000 appearances in goalies compared to position players (0.34 forwards; 0.47 defensemen) with a relative risk of 4.78 (95% CI 2.94 – 7.76; P <0.001).¹² NHL goaltenders are also more likely to miss consecutive games due to injury than position players.¹¹ Increasing awareness of the potential for injury has led to adaptation of rules such as requiring frequent pad changes in an effort to

Should We Limit Time Spent in the “Butterfly”?

By Austin V. Stone MD, PhD, and Shane J. Nho, MD, MS, Division of Sports Medicine, Department of Orthopaedic Surgery, Rush University Medical Center



limit pad flexibility. Despite the efforts to restrict the use of worn padding, the rules change did not demonstrate an effect on goaltender hip kinematics.¹⁰

The specific type of hip injury in symptomatic butterfly goalies appears to be unique from positional players. The location and characteristics of FAI in butterfly goalies was reported to have an

elevated alpha angle and loss of offset that was larger and more lateral than positional players.¹³ An analysis of hip kinematics in butterfly goaltenders found that three primary movements of goaltending duties place the hip at extreme range of motion and the act of stopping, entering butterfly position, and recovering from the save cycling the hip through severe





impingement positions.¹⁴ Given the mechanical strains on the hip during play, butterfly goaltenders may be exacerbating a predilection for symptomatic FAI. In two studies, one comparing asymptomatic youth

hockey players and one comparing elite hockey players, both groups had a much greater prevalence of radiographic cam deformities.^{3,15} Hockey goaltenders had the greatest prevalence of cam-deformities with 93.8% of those studied.¹⁵

A proposed solution to limit the adverse effect from time spent training in the position, may be to enforce practice time limits or a “butterfly count.” This strategy is derived from the successful reduction in repetitive use injuries following pitch count implementations in amateur baseball. The “butterfly count” should be utilized during adolescence while the proximal femoral physis is open and at risk of CAM deformity development. Once the proximal femoral physis was closed, the need for

the butterfly count may not need to be as stringent as the osseous morphology may have fully developed. While it may not be practical to have limits on game time for goaltenders, a limit on practice time in the butterfly position may reduce the cumulative stress on the hip. Early development of cam deformities may lead to symptomatic FAI and the literature continue to support that these deformities develop early and remain persistent. Time spent in the position exposes goaltenders to the most severe ranges of motion for internal rotation as outlined above; we consequently advocate for reduced cumulative exposure to the butterfly position and the repetitive microtrauma by limiting practice time in the butterfly position.

Looking to learn more about preventing and treating hockey injuries? Join AOSSM for Keep Your Edge: Hockey Sports Medicine 2018, August 17–19 in Toronto, Canada. Learn more and register at sportsmed.org.

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