Scoring is the most important part of hockey. But as everyone knows, all shots are not created equal. A penalty shot close to the net has a much greater opportunity to score than a slap shot from the blue line. Simply listing the amount of goals or attempted shots does not provide helpful information, and leaves out other potentially helpful information like: Where on the ice is the player shooting from? What type of shot is he shooting? Is it on the power play or even strength? These factors have a significant effect on the chances of scoring but are often not included when looking at statistics for the top players.

Our work was an attempt to measure the probability that a shot would turn into a goal. We trained on play by play data for 2020-2023 season, and focused on plays where a shot occurred, we then extracted useful factors that could affect a shot like shot distance, type of shot, situational game, and goalie save percentage, all features that can affect how hard it is for an individual player to make a shot. Using this we were able to estimate expected goals, how many goals a player should have been expected to score given the quality of his chances. This allowed us to compare actual goals vs. expected goals and observe which players were consistently over-producing their fair share.

In our test season of 2024, we noted that some of the elite players differentiated themselves from others using Goals Over Expected. Sam Reinhart had the highest at around +20.7 GOE, followed by Auston Matthews (+19.5), Artemi Panarin (+16.8), J.T. Miller (+13.1), and Filip Forsberg (+11.7) to finish the top 5. These players distinguished themselves from the typical player by converting more goals than what our model would have expected them to make, proving themselves to be some of the top finishers.

This is significant because it gives front offices and coaches a sharper eyepiece for measuring talent. GOE can refer to high finishers, alert underpriced players who fly under the radar and beat expectations, and guide line combination or player deployment choices. The exact numbers are estimates, but the consistent trends tell which players have been best scorers in the recent past. With further refinement, such as using situational factors like passing trends, defensive pressures or defensive formations, player fatigue, our model could be improved, making it more accurate and therefore more helpful to teams.