The Engine and the Afterburner: A Data-Driven Guide to What Really Wins Hockey Games

Introduction: The Age-Old Debate in the Modern Era

It is one of the most familiar and dramatic scenes in hockey. A team, trailing by a single goal late in the third period of a pivotal game, forces a turnover. A penalty is called. The home crowd erupts, the broadcast commentators frame the ensuing power play as the single most important moment of the contest, the fulcrum on which the result will turn. This moment taps into a deeply ingrained piece of hockey wisdom: that special teams—the power play (PP) and the penalty kill (PK)—are the ultimate arbiters of success.[1]

While these high-leverage moments are undeniably thrilling, a fundamental question arises when we zoom out from the single-game drama to the broader, 82-game regular season. Do these relatively brief periods of numerical advantage or disadvantage truly represent the primary driver of a team's success? Or does the real story of a winning season lie in the relentless, minute-by-minute grind of even-strength, 5-on-5 play? This report aims to answer that question, using a wealth of modern statistical evidence to investigate where a savvy fan should focus their attention to understand what truly builds a winning hockey team.[2]

The data overwhelmingly shows that 5-on-5 performance is the fundamental *engine* of a team, the powerful and reliable core that drives its position in the standings over the long season. Special teams, while critically important, function more like an *afterburner*—used less frequently but capable of providing decisive, game-changing thrusts. This analysis will guide the reader through an exploration of the basic metrics, the advanced analytics that reveal underlying truths, the crucial question of sustainability, and a myth-busting examination of hockey's most cherished clichés.

The Traditional Toolkit: Deconstructing PP% and PK%

The Basics of the Box Score

For decades, the conversation around special teams has been dominated by two simple, ubiquitous statistics that appear on every broadcast and in every box score.

Power Play Percentage (PP%) is the most common measure of a power play's effectiveness. It is calculated by dividing the total number of goals a team scores while on the power play by the total number of power-play opportunities it receives.[5] It is a straightforward measure of how often a team converts a man advantage into a goal.

Penalty Kill Percentage (PK%) is the inverse, measuring a team's defensive prowess while shorthanded. It is calculated by subtracting the number of power-play goals allowed from the total number of shorthanded situations, and then dividing that result by the total number of shorthanded situations. In essence, it is the percentage of opponent power plays that a team successfully "kills" without conceding a goal.[5]

These two metrics have long formed the bedrock of special teams analysis for fans, coaches, and media alike.[8]

Why the Simplest Numbers Can Lie

Despite their prevalence, PP% and PK% are fundamentally flawed metrics that can often mislead or obscure a team's true performance. Their simplicity is also their greatest weakness.

The most significant limitation is that **PP% is time-insensitive**. It treats every "opportunity" as a single, equal event. A power play that lasts a full two minutes is weighted exactly the same as one that lasts for only 10 seconds before being nullified by an offsetting penalty.[10] A team could be labeled as going "0-for-3" on the night, suggesting a failed power play, when in reality those three "opportunities" may have only amounted to 60 seconds of total 5-on-4 time. This flaw makes it difficult to compare the true efficiency of different units, as one team's opportunities may consistently be shorter than another's through no fault of their own.[10]

This issue is compounded by the **major penalty anomaly**. A five-minute major penalty

presents a unique statistical quirk. If a team scores three goals during a single five-minute power play, the official statistics often record this as the team going 3-for-4. Each goal is considered to have "ended" one opportunity, with the remaining time on the major penalty counting as a new one.[10] This arbitrary rule makes it statistically impossible for a team to be 100% efficient on a major penalty if they score more than once, a clear distortion of the unit's actual performance.

Furthermore, the standard PP% calculation has a **shorthanded blind spot**. It completely ignores shorthanded goals conceded by the power-play team. A unit that scores one power-play goal but also gives up a shorthanded goal on a different opportunity has a net goal differential of zero for its efforts. Yet, if they had five opportunities, their PP% would still be recorded as a successful 20% (1-for-5), masking the fact that their special teams play on the whole was a wash.[14]

These flaws reveal that PP% is not a true measure of efficiency, but rather a measure of binary conversion—how often the *event* of a power play results in a goal. A far more accurate way to assess a power play's danger is to use a rate-based statistic like **Goals For per 60 minutes (GF/60)** of power-play time. This metric normalizes for the actual time spent with a man advantage, providing a much clearer picture of how effectively a unit generates offense when it is on the ice.[12]

The Heart of the Matter: Quantifying the Impact of 5v5 vs. Special Teams

The Ice Time Monopoly

To understand the relative importance of even-strength and special teams play, the first and most crucial piece of evidence is the clock. Academic studies of NHL data consistently show that the vast majority of a hockey game is played at 5-on-5. On average, between 79% and 83% of a game's total ice time occurs at even strength. In contrast, all manpower-imbalanced situations—power plays and penalty kills combined—account for only 15-19% of a typical game.[1] This simple fact of time allocation is the foundation upon which the argument for 5-on-5's primacy is built. It is the default state of hockey, and where the overwhelming majority of the contest is decided.

The Weight of Goals: A Battle of Value vs. Volume

In any given moment, a goal is a goal. Research confirms that, all else being equal (time of game, score), an individual power-play goal and an individual even-strength goal have a similar impact on a team's probability of winning a single game.[1] However, this is where the concept of

volume becomes paramount.

Because nearly 80% of the game is played at 5-on-5, a far greater number of goals are scored in this state. Data shows that while 99% of NHL games feature at least one even-strength goal, fewer than 75% include a power-play goal.[1] This disparity means that a team's 5-on-5 goal differential (goals for minus goals against at even strength) is the single largest component of its overall goal differential for the season. Since overall goal differential is one of the strongest and most reliable predictors of a team's final place in the standings, it follows that 5-on-5 play is the most significant statistical driver of a team's success over an 82-game campaign.[2]

The statistical relationship is not just theoretical; it is borne out in direct correlations.

Performance Metric	Correlation with Winning a Game	Correlation with Earning Standings Points	
Even-Strength Goals For (EV For)	**0.507**	**0.524**	
Power-Play Goals For (PP For)	0.212	0.222	
Source: Adapted from "The Importance of Special Teams in Ice Hockey".[2] A higher correlation value indicates a			

stronger statistical relationship.			

As the table demonstrates, the correlation between scoring even-strength goals and winning games (0.507) or earning points (0.524) is more than double the correlation for power-play goals. This provides clear, quantitative evidence that what a team does during the 80% of the game played at 5-on-5 has a much stronger bearing on its season-long success than what it does in the 20% spent on special teams.

Interestingly, studies also reveal a high correlation between teams that are above-average at 5-on-5 and those that are also above-average on the power play.[1] This suggests that these are not isolated skills. The underlying driver is overall talent. Elite players possess fundamental skills—skating, shooting, hockey IQ, puck control—that translate across all game states. A team that acquires players who can dominate at 5-on-5 will, by extension, have the personnel to build an effective power play. The inverse is not necessarily true; building a team around one-dimensional "power-play specialists" who are liabilities at 5-on-5 is a far riskier and less sustainable strategy. The most robust path to success is to build a dominant 5-on-5 engine and trust that the talent will fuel the afterburner.

A Deeper Look: Advanced Stats for the Modern Fan

To move beyond the flawed traditional metrics and gain a truer understanding of performance, the modern hockey analyst employs a more sophisticated toolkit. Two of the most powerful concepts are Expected Goals (xG) and PDO.

Measuring Process, Not Just Results – Expected Goals (xG)

Expected Goals, or xG, is a metric designed to evaluate the *quality* of a shot attempt, rather than just counting the attempt itself. Every unblocked shot is assigned a value between 0 and 1, which represents the historical probability of a shot with similar characteristics becoming a goal.[18] These characteristics include the shot's location on the ice, the type of shot (e.g., wrist shot, slapshot, one-timer), the angle to the net, and whether it came off a rebound or a rush chance.[20] For example, a low-percentage shot from the blue line might be worth only 0.02 xG, while a high-danger one-timer from the slot could be worth 0.35 xG.

The power of xG lies in its ability to separate a team's underlying *process* from its immediate

results. A team that consistently generates more high-quality chances than its opponent (i.e., has a high xG percentage) is playing a sound, repeatable style of hockey, even if they are in a scoring slump due to bad luck or poor finishing.[21] For special teams, xG is an invaluable diagnostic tool. A power play with a low PP% but a high rate of xG For is likely just unlucky and should probably stick with its strategy. Conversely, a power play with a high PP% but a low xG rate is likely benefiting from fortunate bounces and is a prime candidate for a future decline, or "regression".[22]

Quantifying "Puck Luck" – An Introduction to PDO

PDO is a statistic that attempts to quantify the often-unspoken element of luck in hockey. Its calculation is simple: it is the sum of a team's on-ice shooting percentage and its on-ice save percentage, almost always measured at 5-on-5.[23] The name itself is not an acronym; it comes from the online gaming handle of Brian King, the analyst who first proposed it.[24]

The core principle behind PDO is **regression to the mean**. Across the entire league, for every goal scored (a shot that goes in), there is a goal allowed (a shot that is not saved). Therefore, the league-wide sum of shooting percentage and save percentage must always equal 100% (or 1000, or 1.000, depending on the scale used).[25] Over a large enough sample size, most teams will naturally drift back toward this average of 100.

A team with a PDO significantly above 100 (e.g., 102.5) is said to be "riding the percentages." They are likely scoring on an unsustainably high percentage of their shots, getting unsustainably good goaltending, or both. This team is considered "lucky" and is expected to see its results decline over time. Conversely, a team with a PDO well below 100 (e.g., 97.5) is likely playing better than its record indicates and is due for positive regression.[24] While skill certainly influences shooting and save percentages, PDO helps isolate the significant role that random variance plays over a season.

The Stability Question: Is Special Teams Success a Repeatable Skill?

A key question for any performance metric is its stability. Is a team that is good on the power play one year likely to be good the next? The answer, rooted in statistics, reveals a crucial

difference between the two special teams units.

Because special teams account for a much smaller portion of game time, the sample size of minutes is inherently smaller than for 5-on-5 play. This means that random chance and variance play a much larger role in the outcomes.[28] A few fortunate bounces or a goalie's hot streak can dramatically swing a team's PP% or PK% over a single season, making these metrics more volatile and less predictable year-to-year than their 5-on-5 counterparts.[30]

Early analytical studies found that the best predictor of future **power-play** success was not past PP%, but rather the rate at which a unit generated unblocked shot attempts (a metric known as Fenwick).[30] This suggested that the process of creating chances was more stable than the result of converting them. However, even this relationship has weakened over time, highlighting the fundamentally volatile nature of power-play scoring, which is heavily dependent on the fluctuating and often luck-driven nature of shooting percentage.[30]

In stark contrast, **penalty kill** success has proven to be a more repeatable skill. A primary reason for this stability is the outsized role of goaltending. While a team's collective shooting talent can run hot and cold, an individual goalie's save percentage is a more consistent and repeatable talent from season to season.[28] A team with an elite goaltender has a stable foundation upon which to build a consistently effective penalty kill.

This creates a fascinating strategic asymmetry in team building. A general manager can invest in a top-tier goaltender and strong defensive skaters with a high degree of confidence that they can build a sustainable, year-over-year elite penalty kill. It is a reliable pillar. Building a power play that is *consistently* at the very top of the league is a much more difficult proposition, as it is more susceptible to the whims of puck luck and the inherent variance of shooting percentage. A great PK provides a stable defensive floor, while a great PP is a powerful but less dependable offensive ceiling.

Case Studies: When the Numbers Diverge

The tension between 5-on-5 strength and special teams prowess creates distinct team archetypes whose fates often illustrate the principles of hockey analytics.

The Special Teams Paper Tiger

This is a team whose respectable special teams numbers mask a fatal flaw at its 5-on-5 core. The **Chicago Blackhawks** of recent seasons have often fit this profile, posting a top-10 special teams unit but ranking near the bottom of the league in 5-on-5 goal differential, which ultimately lands them in the draft lottery.[33] Historically, the

Edmonton Oilers have also exemplified this type, boasting a record-breaking power play led by generational talents but struggling to control play at even strength. Their success often felt precarious, overly dependent on their ability to draw penalties rather than dictate the flow of the game.[34]

The 5v5 Juggernaut with an Achilles' Heel

The opposite scenario involves a team that dominates at even strength but is consistently undermined by its special teams. The **2018-19 Florida Panthers** were a notable example, a team with excellent special teams that ultimately missed the playoffs because of poor 5-on-5 play.[36] More recently, the

Buffalo Sabres have been a case study in this frustration. For several seasons, their underlying 5-on-5 metrics have suggested a team on the cusp of a breakthrough, only to be dragged down by "abysmal" power play and penalty kill units that cost them crucial points in the standings.[37]

Team (2022-23 Season)	Profile	5v5 Goal Diff. Rank	PP% Rank	PK% Rank	Final Standings Result
Boston Bruins	Balanced Contender	1st	12th	1st	Won Presidents' Trophy
Edmonton Oilers	Special Teams Specialist	10th	1st	20th	Lost in 2nd Round
Buffalo Sabres	5v5 Juggernaut (Flawed)	5th	9th	28th	Missed Playoffs

Chicago Blackhawks	Paper Tiger	32nd	28th	21st	Lottery Team

Note: Ranks are among 32 NHL teams for the 2022-23 regular season.

Mythbusting: Do Special Teams *Really* Win Championships?

One of the most enduring pieces of hockey wisdom is the "100 Rule," a heuristic popularized by Hall of Fame coach Ken Hitchcock. It posits that if a team's PP% and PK% add up to a value greater than 100, that team is in good shape to make the playoffs.[33] While it serves as a useful quick-check, a look at recent Stanley Cup champions reveals it is far from a prerequisite for ultimate success. The

2022-23 Vegas Golden Knights hoisted the Cup with a regular-season penalty kill that ranked 19th in the league. The **2016-17 Pittsburgh Penguins** won it all with a PK ranked 20th.[38] These were not elite units by any stretch, but their dominance at 5-on-5 was more than enough to compensate.

In fact, a detailed analysis of recent champions reveals a clear and powerful trend: **5-on-5 play is a greater predictor of Stanley Cup success than special teams performance**.[38] While many recent winners have had a top-10 power play, the correlation is weakening. The consistent hallmark of a champion is elite performance—either offensively, defensively, or both—at even strength. The idea that a team can ride a hot power play to a championship is largely a myth; the foundation of a title contender must be built during the 80% of the game played 5-on-5.[39]

This begs the question: if the data is so clear, why does the "special teams win championships" cliché persist? The answer lies in the playoff paradox. The 82-game regular season is a large sample size, where the law of averages prevails and the superior 5-on-5 engine will almost always rise to the top. The Stanley Cup Playoffs, however, are a series of short, high-stakes tournaments. In a seven-game series, the sample size is tiny. A single power-play goal in overtime or one failed penalty kill can directly alter the outcome of an entire series in a way that gets statistically diluted over a full season. The moments are more memorable and feel more consequential.[41] The saying persists because our memories are seared with these high-leverage playoff moments where a special teams play directly decided a series. The cliché is therefore contextually true for the micro-moments of the playoffs, even

if it is statistically false for the macro-narrative of a championship season.

Conclusion: A Balanced View for the Savvy Fan

The evidence leads to a clear and actionable conclusion for any fan seeking to truly understand the anatomy of a winning hockey team. The long, grueling 82-game season is a test of a team's core competency, and that competency is overwhelmingly demonstrated at 5-on-5. This is the reliable, powerful engine that propels a team into a playoff position. It is the most stable, repeatable, and predictive measure of a team's true talent.

Special teams are the high-performance afterburner. They are engaged less frequently, their performance is more volatile, but they are capable of providing the critical bursts of speed needed to win tight races—especially in the small-sample, high-stakes environment of the playoffs.

To assess a team's fundamental quality and long-term potential, an informed fan should begin with its 5-on-5 metrics. Start with their 5-on-5 goal differential, and for a deeper, more predictive look, examine their expected goals (xG) differential. This is the team's foundation. Only then should one evaluate their special teams, viewing them as either a powerful force multiplier or a critical, exploitable flaw. A team with a dominant 5-on-5 engine and a functioning afterburner is a true Stanley Cup contender. A team with a powerful afterburner but a sputtering engine is an exciting but ultimately unreliable vehicle, prone to breaking down long before it reaches the finish line.

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