2024 TO 2025 TRANSITION
ROHAN RIDERS
MONEYBALL REPORT
(Games 1-21)

INTRODUCTION

METRIC DEFINITIONS:

- Matches Played: games with at least 1 penalty corner contributions (understanding a contribution as a penalty corner in which the player made contact with the ball once at least).
- Total PC Taken: penalty corners with player's contributions/involvement during the initial play or the rebound phase.
- Goal: player scored a goal during the initial play or the rebound phase.
- Assists: player made the pass that led to a goal during the initial play or the rebound phase.
- On-Target Shots: shots that were saved by the goalkeeper or a defensive save behind the goalkeeper, during the initial play or the rebound phase.
- Rebounds Created: a player's shot on goal that was saved by the goalkeeper or a defensive save behind the goalkeeper, that allowed another teammate to get the rebound (during the initial play or the rebound phase).
- Rebounds Collected: player recovering a rebound off any kind of shot: on-target, wide, blocked, missed, etc., during the initial play or the rebound phase.
- Blocked Shots: a shot aiming for the goal that was blocked by a defender before getting to the goalkeeper's height.
- Total Shots from PC: all shots that a player took during the initial play or rebound phase of a penalty corner: on goal, wide, blocked, missed, etc.
- Total Team Goals: all goals scored during the season by the team being analyzed (PC goals and non-PC goals included).
- Team Wins: total of wins that the team being analyzed had during the current season.

FORMULA DEFINITIONS:

PCE (PENALTY CORNER EFFICIENCY):

$$\text{PCE} = \frac{\text{Goals + Assists + Rebounds Created}}{\text{Total PC Taken}}$$

PCE measures a player's overall efficiency during penalty corners by combining goals, assists, and rebounds created relative to the number of penalty corners that they have taken part in. This metric is useful for evaluating how effective a player is at generating offensive contributions from penalty corners, making it a key stat for coaches analyzing set piece's performance. By looking at PCE, teams can identify players who maximize their impact in penalty corners and refine their strategies accordingly.

Practical example:
If a player has been involved in 20 penalty corners and has recorded 5 goals, 3 assists, and 2 rebounds created, his/her PCE would be: (5 + 3 + 2) / 20 = 0.50.
This means that the player is generating a direct offensive impact in 50% of the penalty corners they participate in, which is a strong indicator of effectiveness.

Scale:

- Below 0.15 – Low efficiency
- 0.15 – 0.30 – Average efficiency
- 0.30 – 0.60 – High efficiency
- 0.60+ - Elite penalty corner performer

SPDF (SLUGGING PERCENTAGE):

$$\text{SPDF} = \frac{(1 \text{ X On-Target Shots}) + (2 \text{ x Goals}) + (1.5 \text{ x Rebounds Created}) + (0.5 \text{ x Blocked Shots})}{\text{Total shots from PC}}$$

Inspired by baseball's slugging percentage (metric that measures a player's hitting ability), SPDF evaluates a player's shooting quality and finishing ability in penalty corners by weighing different shot outcomes based on their importance. The formula considers shots on target, goals, rebounds created, and blocked shots, then adjusts for total shots taken to assess a player's efficiency in making their shots count. This metric is particularly useful for identifying which players are the most effective shooters in penalty corner situations, making it an essential stat for assessing strikers and drag-flickers. It also allows coaches to find undervalued players that do not typically score goals, but create great scoring opportunities through their shooting quality.

Practical example:
If a player has 5 shots on target, 4 goals, 3 rebounds created, and 6 blocked shots, with 20 total shots taken, their SPDF would be: ((1 x 5) + (2 x 4) + (1.5 x 3) + (0.5 x 6)) / 20 = 1.03.
This means that the player has an above-average shot efficiency, converting their shot attempts into meaningful plays at a strong rate.

Scale:

- Below 1.00 – Inefficient shooter
- 1.00 – 1.25 – Average shooter
- 1.25 – 2.00 – Strong shooter
- 2.00+ - Elite finisher

PCR (PENALTY CORNER RUNS CREATED):

$$\text{PCR} = (\text{Goals} + \text{Assists} + (0.5 \times \text{Rebounds Collected})) \times \frac{\text{Total Shots from PC}}{\text{Total PC Taken}}$$

PCR measures a player's overall impact per penalty corner taken, focusing on offensive contributions such as goals, assists, and rebounds collected while also factoring shots taken. This metric is valuable for evaluating how efficiently a player capitalizes on their penalty corner opportunities. Unlike general goal-scoring metrics, PCR accounts for both scoring and playmaking involvement, providing a more complete picture of a player's effectiveness in penalty corners.

Practical example:
If a player has 2 goals, 1 assist, and 5 rebounds collected, with 6 total shots from PCs and 40 penalty corners taken, their PCR would be: (2 + 1 + (0.5 x 5)) x (6/40) = 25.
This means that the player has a high offensive impact per penalty corner, making them an effective contributor in set-pieces situations.

Scale:

- Below 2 – Low-impact PC player
- 2 – 4 – Average contributor
- 4 – 6 – Strong PC performer
- 6+ - Elite impact player

PCEW (PENALTY CORNER EXPECTED WINS):

$$\text{PCEW} = \left(\frac{\text{Goals} + (0.7 \times \text{Assists}) + (0.5 \times \text{Rebounds Created}) + (0.3 \times \text{Rebounds Collected})}{\text{Total Team Goals}} \right) \times \text{Team Wins}$$

PCEW measures how much a player's penalty corner performance contributes to their team's overall success. It adjusts a player's set piece contributions by scaling it against total team goals (including non-PC goals) and multiplying by team wins, making it an essential stat for understanding how valuable a player's penalty corner impact is in relation to winning games. This metric is particularly useful for evaluating key players in winning teams and identifying whether a team relies heavily on penalty corners for their success.

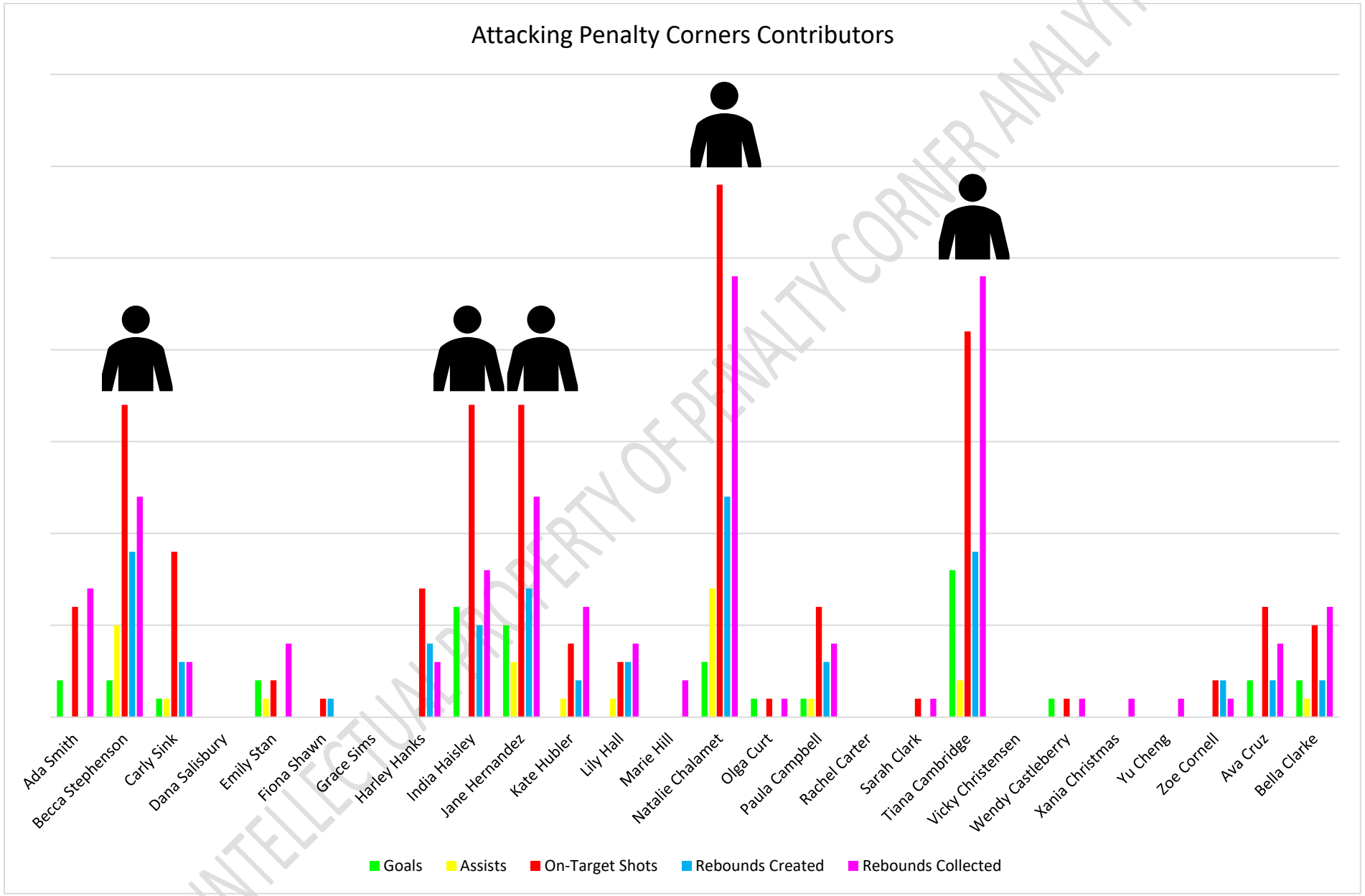
Practical example:
A player has 8 goals, 5 assists, 4 rebounds created, and 3 rebounds collected in a season where their team has scored 50 total goals and won 12 games. Their PCEW would be: (8 + (0.7 x 5) + (0.5 x 4) + (0.3 x 3) / 50) x 12 = 3.46.
This means that the player's penalty corner contributions play a significant role in their team's ability to win games.

Scale:

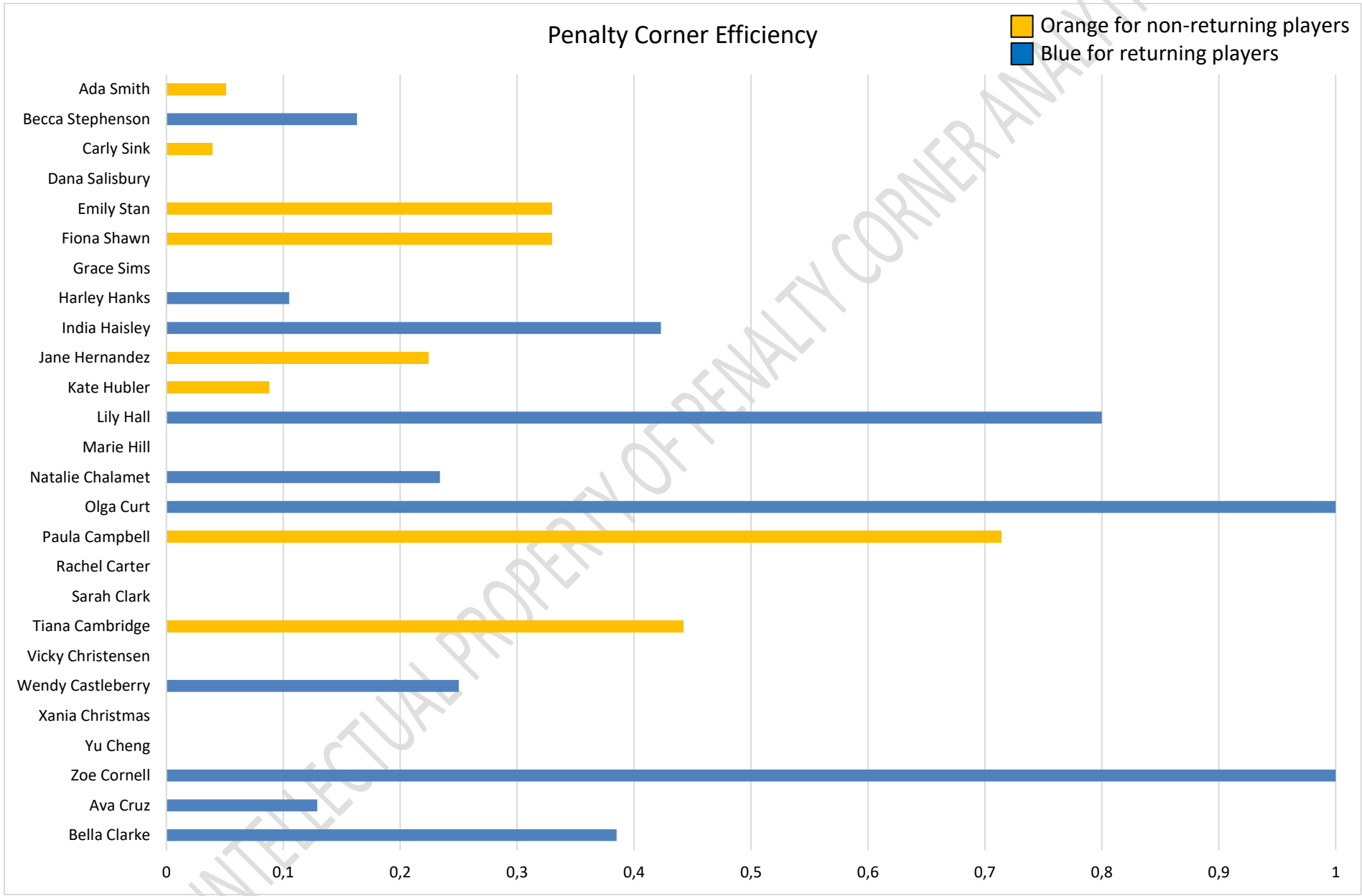
- Below 0.75 – Low-impact on team success
- 0.75 – 1.25 – Moderate contribution
- 1.25 – 2.50 – Strong impact
- 2.50+ - Elite game-changer

2025 TRANSITION ANALYSIS

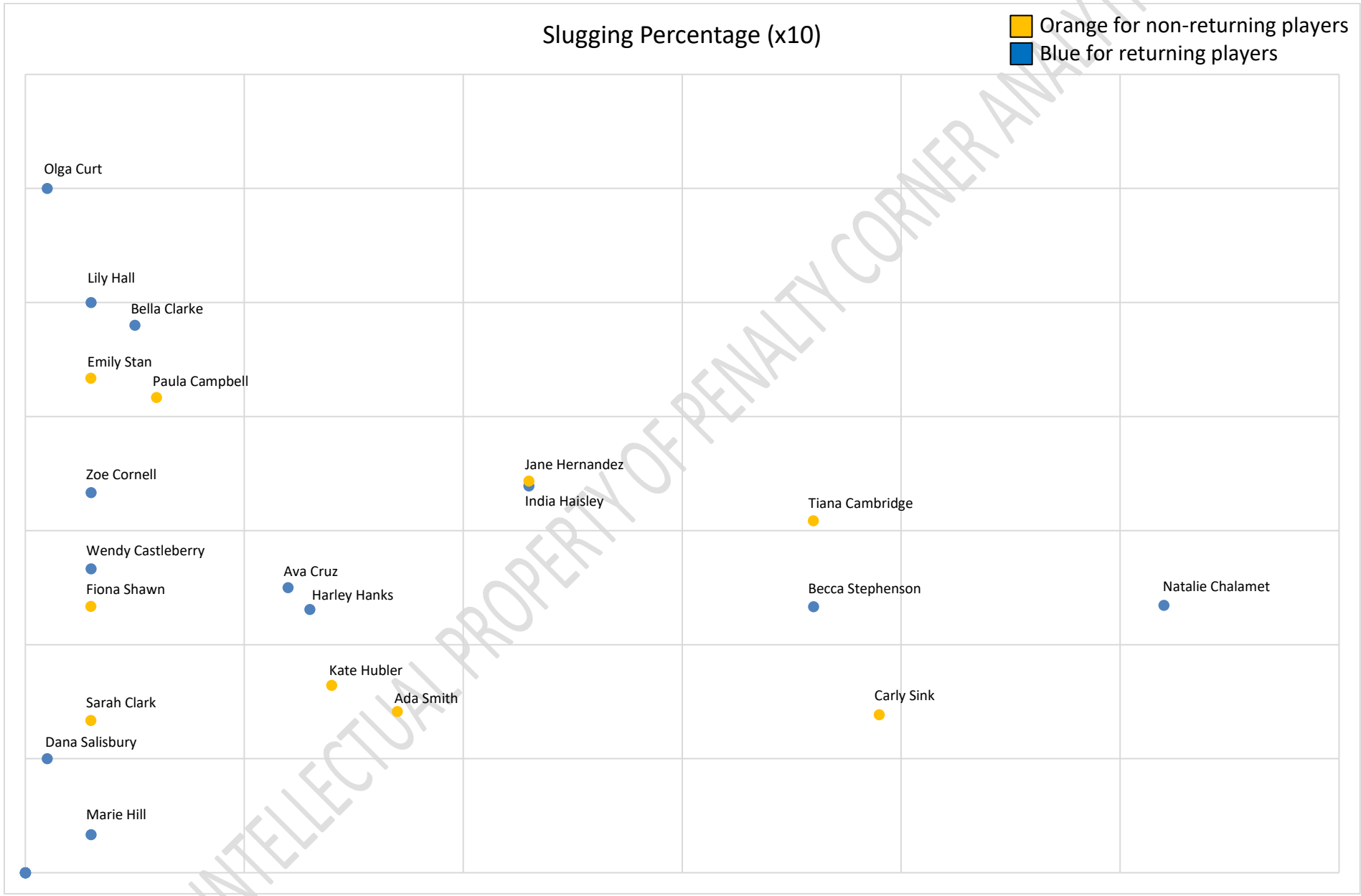
BIGGEST CONTRIBUTORS:



PENALTY CORNER EFFICIENCY (PCE):



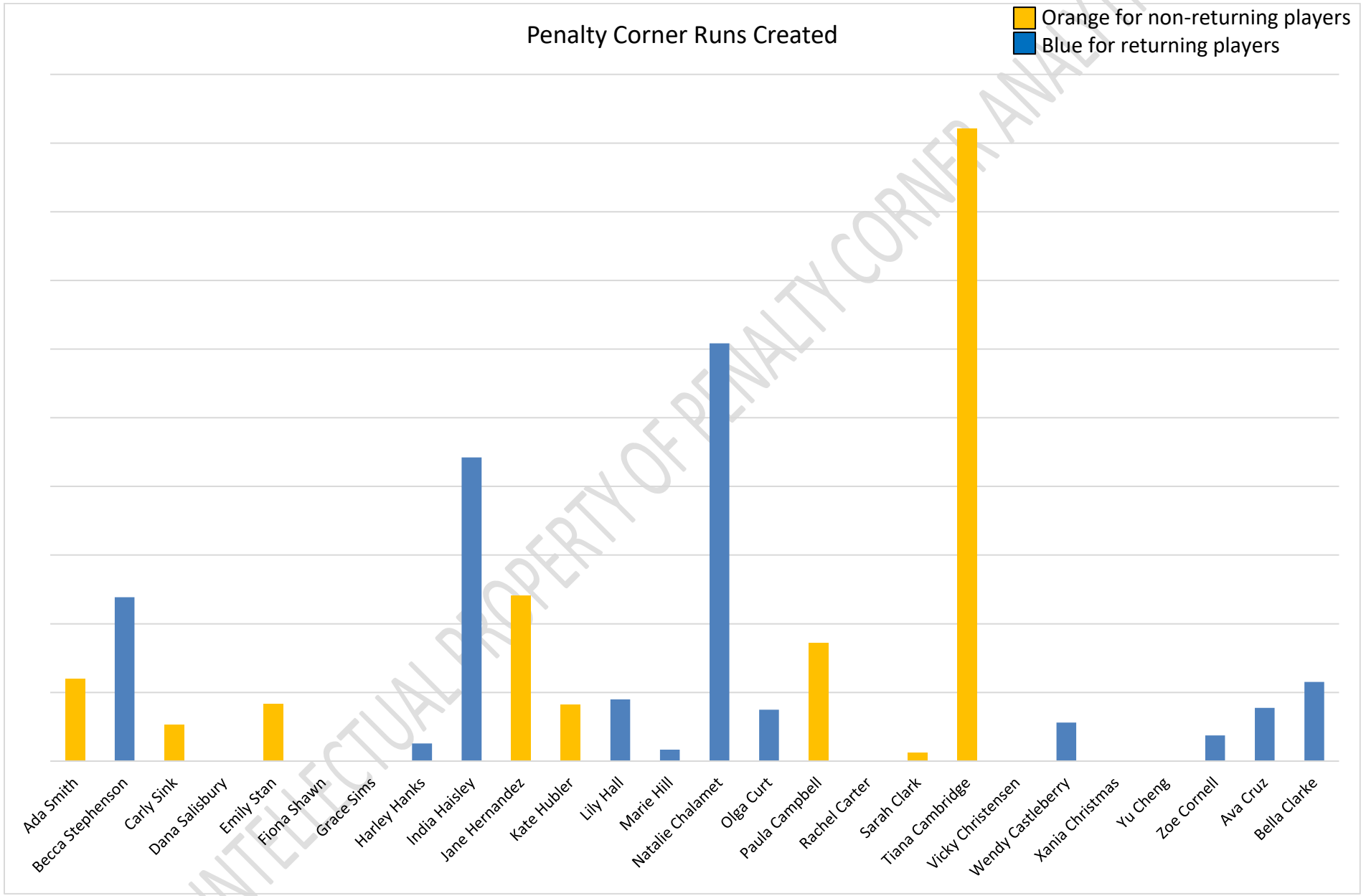
SLUGGING PERCENTAGE (SPDF):



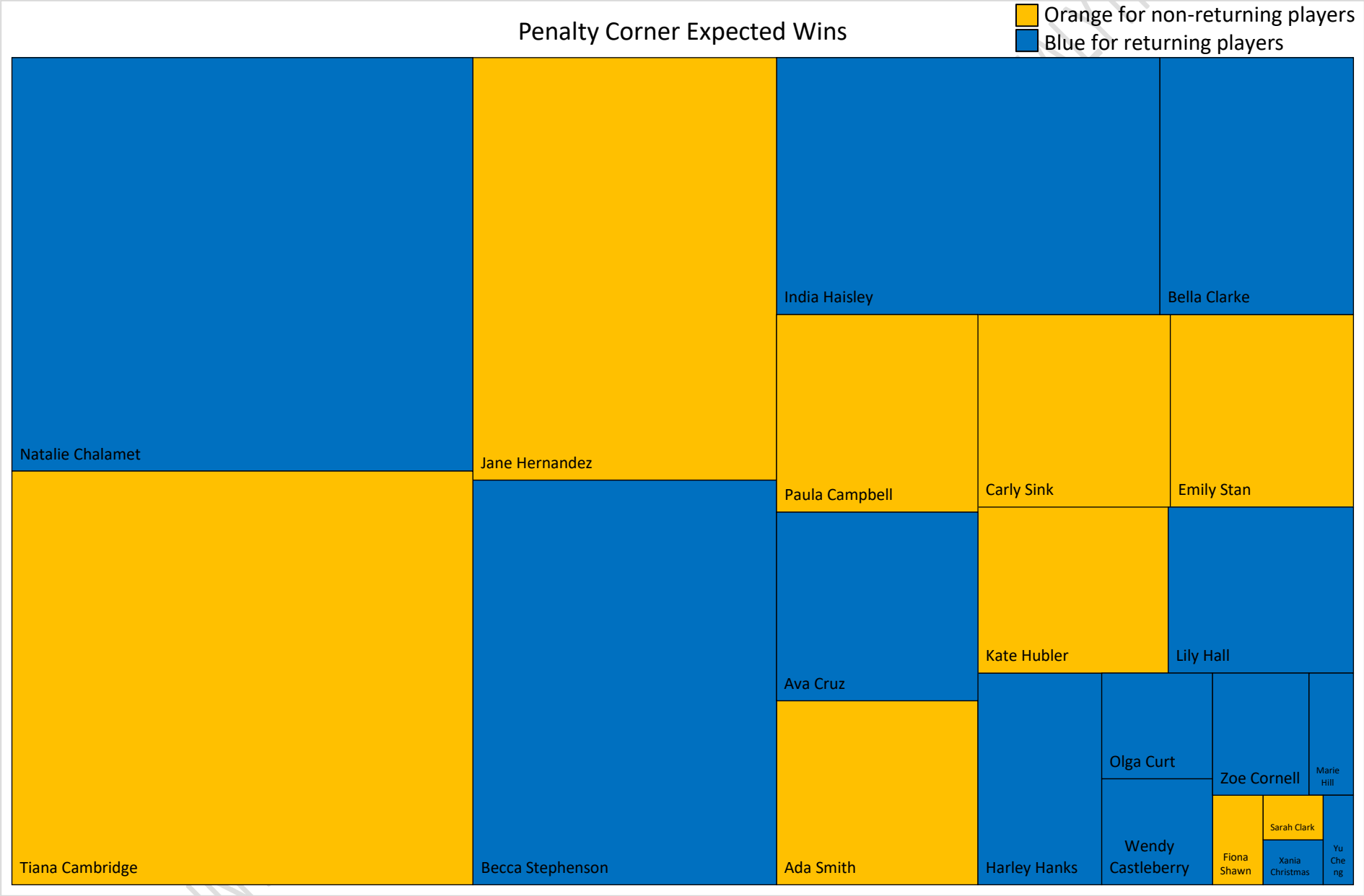
Players with 0: Grace Sims, Rachel Carter, Vicky Christensen, Xania Christmas & Yu Cheng.

Slugging values have been multiplied by x10 for presentation purposes, but scales were kept to not affect the player balance and comparison.

PENALTY CORNER RUNS CREATED (PCR):



PENALTY CORNER EXPECTED WINS (PCEW):



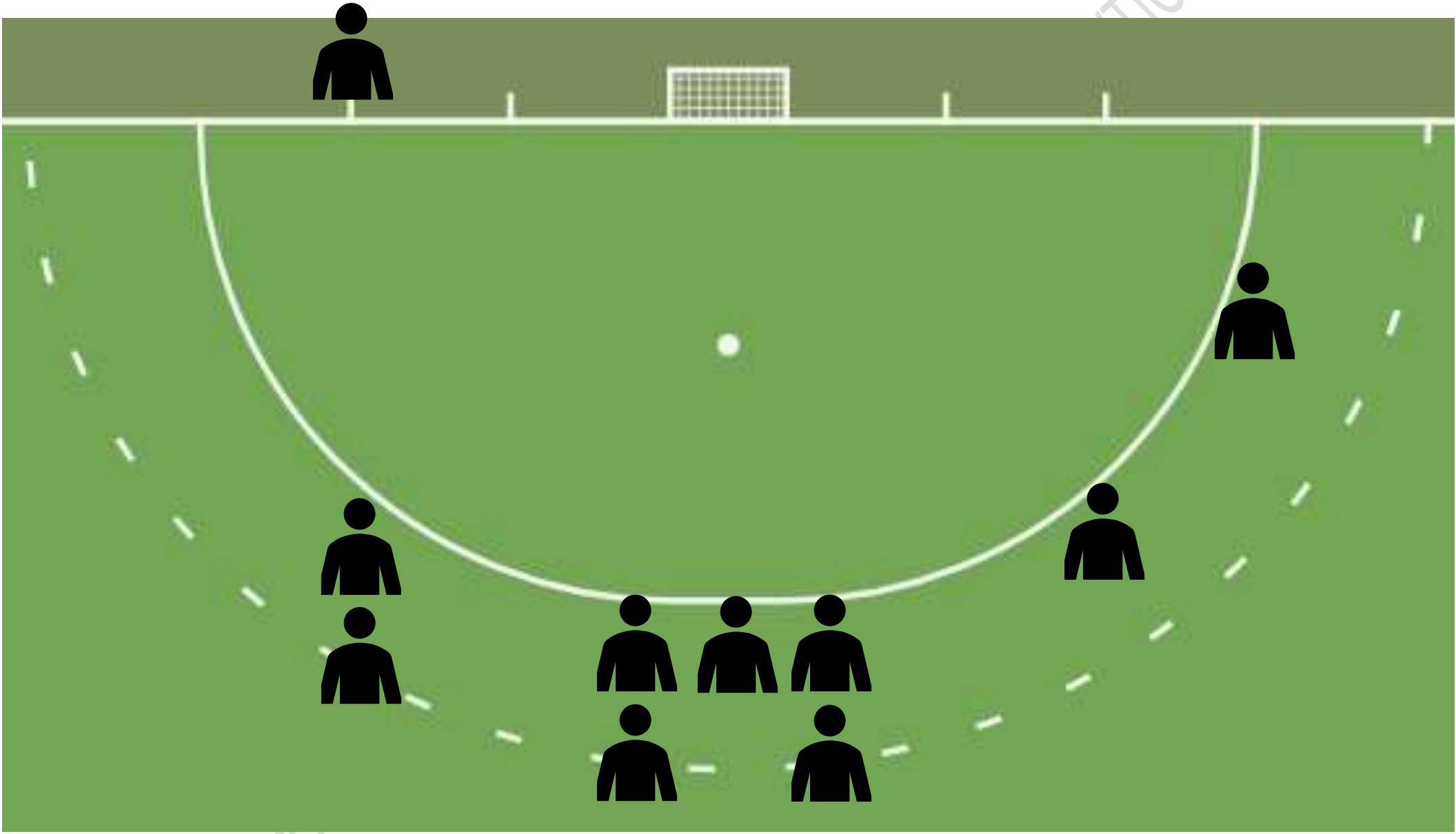
PLAYERS METRICS:

Player Name	Matched Played	PC Taken	Goals	Assists	On-Target Shots	Rebounds Created	Rebounds Collected	Blocked Shots	Total Shots from PC	Total Team Goals	Team Wins
Ada Smith	14	39	2	0	6	0	7	4	17	79	18
Becca S.	19	98	2	5	17	9	12	15	36	79	18
Carly Sink	18	129	1	1	9	3	3	23	39	79	18
Dana Salisbury	1	2	0	0	0	0	0	1	1	79	18
Emily Stan	7	9	2	1	2	0	4	1	3	79	18
Fiona Shawn	2	3	0	0	1	1	0	2	3	79	18
Grace Sims	0	0	0	0	0	0	0	0	0	79	18
Harley Hanks	18	38	0	0	7	4	3	4	13	79	18
India Haisley	14	26	6	0	17	5	8	5	23	79	18
Jane H.	16	67	5	3	17	7	12	4	23	79	18
Kate Hubler	12	34	0	1	4	2	6	9	14	79	18
Lily Hall	4	5	0	1	3	3	4	0	3	79	18
Marie Hill	5	9	0	0	0	0	2	1	3	79	18
Natalie C.	20	94	3	7	29	12	24	16	52	79	18
Olga Curt	1	1	1	0	1	0	1	0	1	79	18
Paula C.	5	7	1	1	6	3	4	0	6	79	18
Rachel Carter	0	0	0	0	0	0	0	0	0	79	18
Sarah Clark	3	6	0	0	1	0	1	2	3	79	18
Tiana C.	17	43	8	2	21	9	24	10	36	79	18
Vicky C.	2	3	0	0	0	0	0	0	0	79	18
Wendy C.	2	4	1	0	1	0	1	2	3	79	18
Xania C.	2	2	0	0	0	0	1	0	0	79	18
Yu Cheng	1	1	0	0	0	0	1	0	0	79	18
Zoe Cornell	2	2	0	0	2	2	1	0	3	79	18
Ava Cruz	12	31	2	0	6	2	4	4	12	79	18
Bella Clarke	8	13	2	1	5	2	6	0	5	79	18

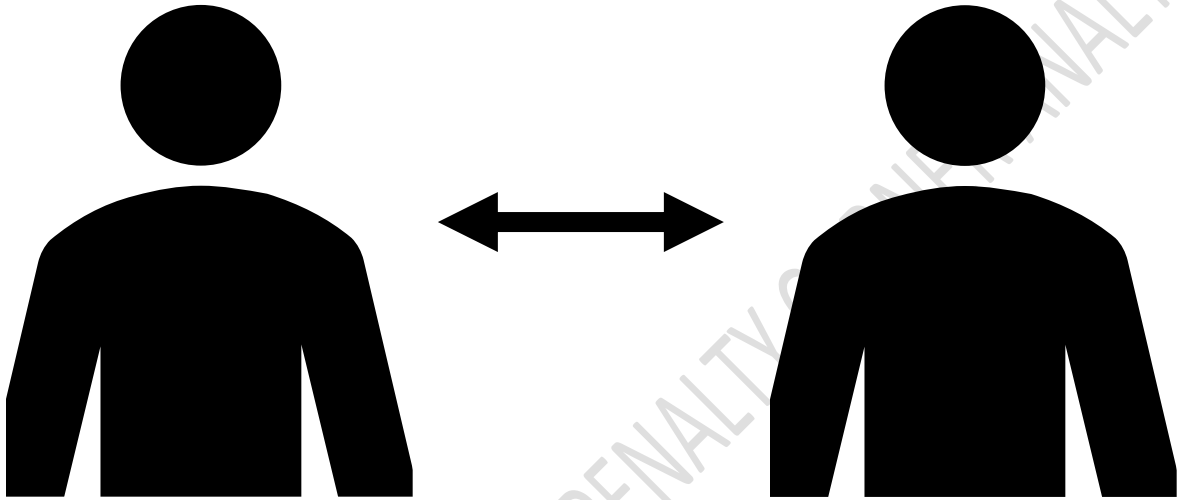
PLAYERS VALUES:

Player Name	Penalty Corner Efficiency (PCE)	Slugging Percentage (SPDF)	Penalty Corner Runs Created (PCR)	Penalty Corner Expected Wins (PCEW)
Ada Smith	0.051	0.706	2.397	0.934
Becca Stephenson	0.163	1.167	4.776	3.099
Carly Sink	0.039	0.692	1.058	0.934
Dana Salisbury	0.000	0.500	0.000	0.000
Emily Stan	0.333	2.167	1.667	0.889
Fiona Shawn	0.333	1.167	0.000	0.114
Grace Sims	-	-	-	0.000
Harley Hanks	0.105	1.154	0.513	0.661
India Haisley	0.423	1.696	8.846	2.484
Jane Hernandez	0.224	1.717	4.806	3.235
Kate Hubler	0.088	0.821	1.647	0.797
Lily Hall	0.800	2.500	1.800	0.775
Marie Hill	0.000	0.167	0.333	0.137
Natalie Chalamet	0.234	1.173	12.170	4.808
Olga Curt	1.000	3.000	1.500	0.296
Paula Campbell	0.714	2.083	3.429	1.003
Rachel Carter	-	-	-	0.000
Sarah Clark	0.000	0.667	0.250	0.068
Tiana Cambridge	0.442	1.542	18.419	4.808
Vicky Christensen	0.000	-	0.000	0.000
Wendy Castleberry	0.250	1.333	1.125	0.296
Xania Christmas	0.000	-	0.000	0.068
Yu Cheng	0.000	-	0.000	0.068
Zoe Cornell	1.000	1.667	0.750	0.296
Ava Cruz	0.129	1.250	1.548	0.957
Bella Clarke	0.385	2.400	2.308	1.253

POTENTIAL REPLACEMENTS:



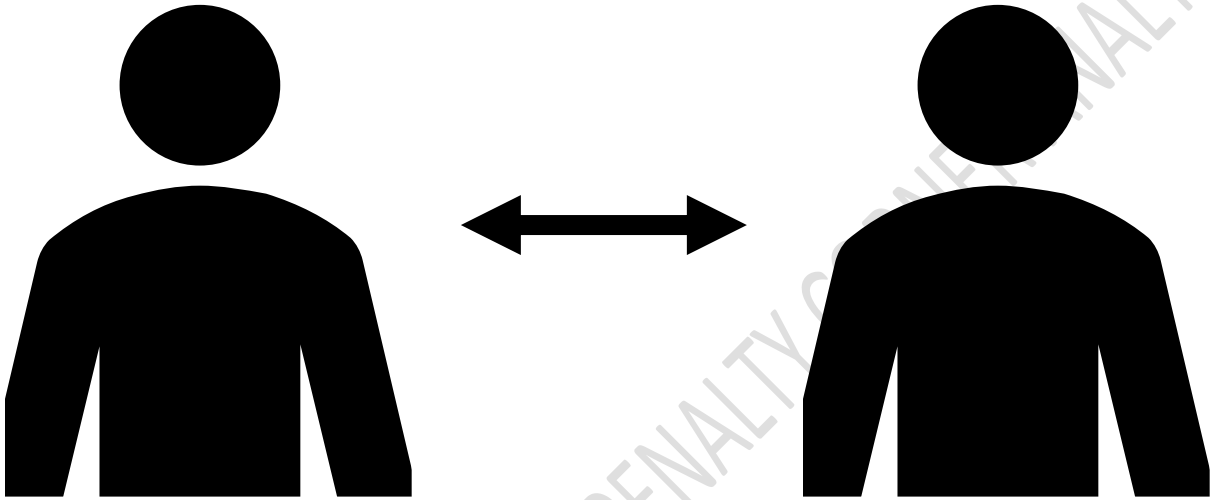
INSERTER POSITION:



	JANE HERNANDEZ	LILY HALL
PCE	0.224	0.800
SPDF	1.717	2.500
PCR	4.806	1.800
PCEW	3.235	0.775
INSERTING ACCURACY	90.76	100

Given the secondary paper from Lily Hall compared to Jane Hernandez (5 PC Taken vs 67), it is normal that she has lower PCR and PCEW. Considering the PCE and SPDF scores from Hall, if she can insert at rates as good as Hernandez in 2024 (+90%), she has the potential to improve penalty corner execution and Hernandez's overall impact. Coaches' must also keep in mind that as players contribute in more corners, their PCE and SPDF tend to decrease; despite this, based on data available with Hall inserting in 2025, Rohan should be able to improve corner performance.

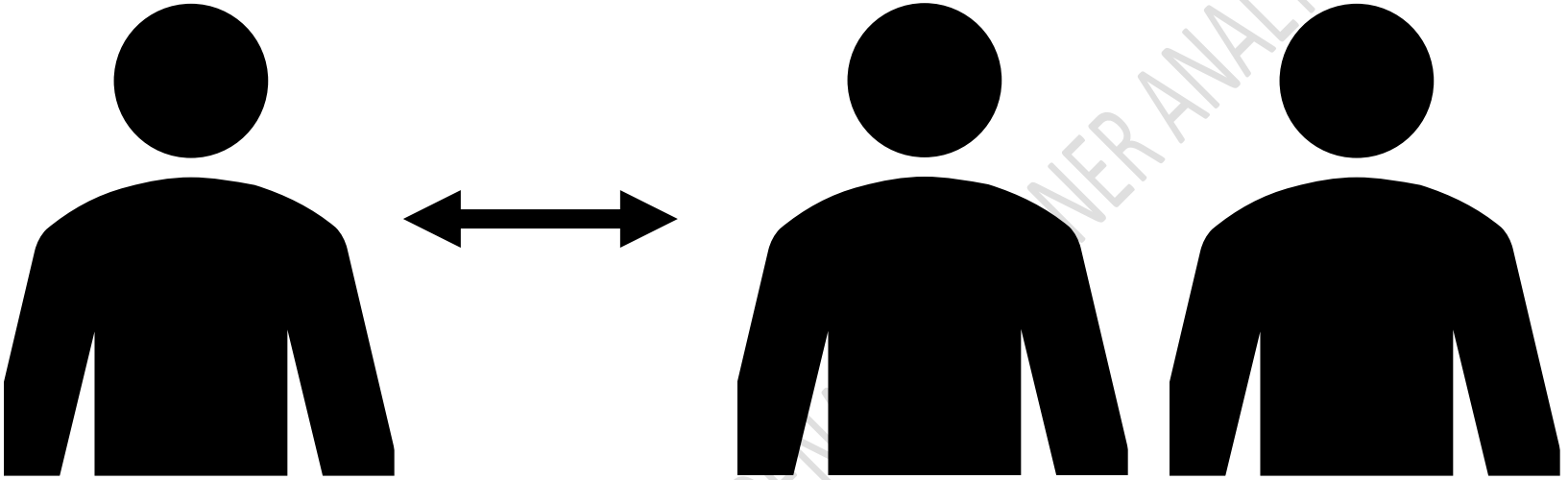
NUMBER 1 POSITION:



	CARLY SINK	AVA CRUZ
PCE	0.039	0.129
SPDF	0.692	1.250
PCR	1.058	1.548
PCEW	0.934	0.957
PASSING ACCURACY	84.52	92.30
RECEPTION INDEX	0.925	1.000

Considering Rohan's penalty corner playbook style (passing play dominance) and the role from the player on position 1 (mainly an insert receiver and passer to assist teammates), besides the 4 formulas used, we also included passing accuracy and reception mistakes index to help pick the best option. Carly Sink had a huge role on Rohan's success in 2024, but according to data, with Ava Cruz replacing her, we can anticipate a direct positive impact on performance, and an increase in overall scoring rates.

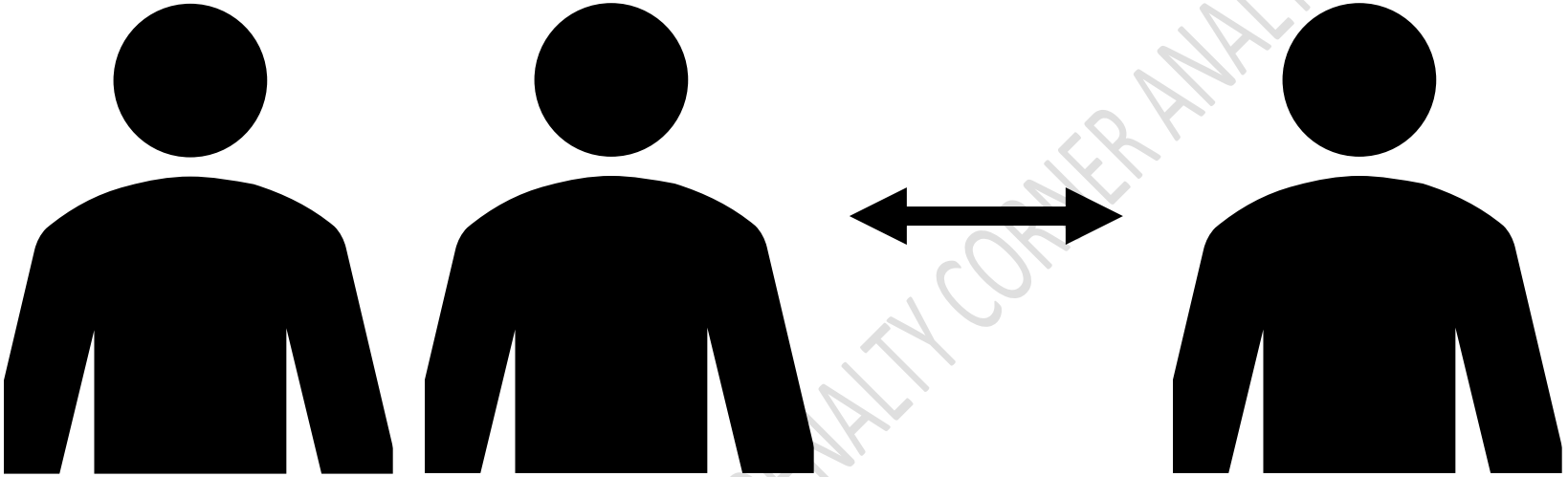
NUMBER 1 POSITION (OTHER POTENTIAL REPLACEMENTS):



	CARLY SINK	HARLEY HANKS	NATALIE CHALAMET
PCE	0.039	0.105	0.234
SPDF	0.692	1.154	1.173
PCR	1.058	0.513	12.170
PCEW	0.934	0.661	4.808
PASSING ACCURACY	84.52	93.75	85.71
RECEPTION INDEX	0.925	0.958	0.948

Another natural replacement for Carly Sink on position 1 would be Harley Hanks, although she drops in all but one value compared to Ava Cruz. The pro for Hanks ahead of Cruz is the passing accuracy, as she improves by 01.45 points. Natalie Chalamet would be another great option to replace Sink on position 1, but we would not make that pick (at least to start the season), given Chalamet's unique role and huge impact from the short position. Despite that, she is an option to always keep in mind. Overall, team should improve their penalty corner performance the most with Cruz on position 1.

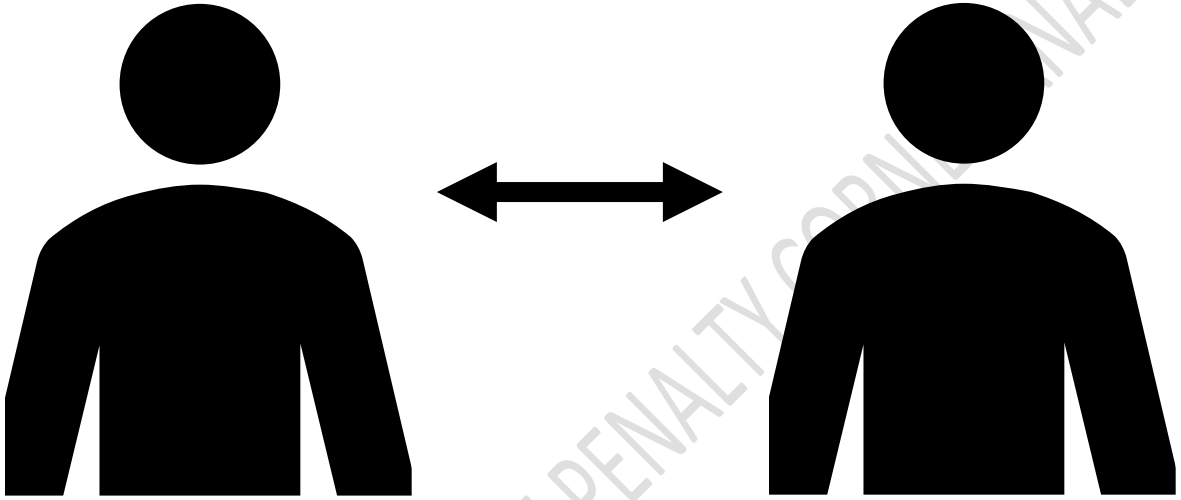
NUMBER 3 POSITION:



	ADA SMITH	KATE HUBLER	HARLEY HANKS
PCE	0.051	0.088	0.105
SPDF	0.706	0.821	1.154
PCR	2.397	1.647	0.513
PCEW	0.934	0.797	0.661
PASSING ACCURACY	100	100	93.75
RECEPTION INDEX	0.933	1.000	0.958

All 3 players excel in different areas, with Harley Hanks as the starter on position 3, it is likely that setting up mistakes (pass + reception) will increase slightly compared to Kate Hubler (0 setting up mistakes during 2024 season). But on the other hand, it is also likely that the team will be able to create more dangerous situations from position 3, given Hanks better scores for PCE and SPDF.

NUMBER 5 POSITION:



	TIANA CAMBRIDGE	BELLA CLARKE
PCE	0.442	0.385
SPDF	1.542	2.400
PCR	18.419	2.308
PCEW	4.808	1.253

It is pretty clear that finding a replacement for Tiana Cambridge will not be possible unlike other positions, but Bella Clarke's scores have shown a hidden value that makes her a potential replacement. Adding Clarke's impact to India Haisley's numbers, can help make up for Cambridge's scores and overall impact on penalty corner performance.

2024 STARTING PENALTY CORNER LINEUP vs POTENTIAL 2025 LINEUP:

	2024	2025
PCE AVERAGE	**0.225**	**0.319**
SPDF AVERAGE	**1.241**	**1.620**
PCR AVERAGE	**7.496**	**4.565**
PCEW AVERAGE	**2.900**	**2.005**
PASSING RATE AVERAGE	**86.38**	**89.51**
RECEPTION INDEX AVERAGE	**0.941**	**0.947**

Based on data available, with the potential replacements suggested, the 2025 season can be even more successful than 2024 in regards of penalty corners: players on the PC starting lineup this year should have a better efficiency rate than last season, which should result in more goals. This makes plenty of sense considering that the team's SPDF average should increase: having better average shooters creates more scoring situations. And all that despite letting go the biggest PC threat, Tiana Cambridge. The APC unit decreases on PCR and PCEW, which is expected given that these values go up as the players participate in more corners. Considering the expected increases on PCE and SPDF, both PCR and PCEW should be able to reach 2024 levels if not higher in 2025. Lastly, with this lineup, the unit should also be able to limit setting up mistakes (pass + reception), resulting in better executions. There is also the potential for freshmen that might be able to play right away and help improve these averages.