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# Coaching Handbook for Goal Kicking in Rugby 15s & Rugby 7s



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**Abstract****Author:** Diarmuid Clancy**Title of Publication:** Coaching Handbook for Goal Kicking in Rugby 15s & Rugby 7s**Degree Title:** Sports and Leisure Management**Keywords:** rugby, kicking, handbook, coaching

The commissioning party for this thesis was the Danish rugby union. The topic of this thesis was chosen during the authors practical training period with the commissioning party, where they saw the need for a coaching handbook for kicking in the sports of rugby 15's & rugby 7's. The handbook is aimed at coaches and athletes that are members of the Danish rugby union. While the coaches are well educated in rugby coaching, kicking is a very specific skill that in the opinion of the commissioning party and the author, needed more detailed guidelines for the coaches.

The thesis process started with the author researching previous literature on the topics of kicking biomechanics, motor learning, strength & resistance training, & sport psychology. This information was then compiled logically and put into a coaching handbook using product development theory as a guide.

The handbook can be used by coaches and athletes of the Danish rugby union. This can give them new perspectives on how to identify proper kicking technique, how to coach it and how to increase the performance output of the skill.

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## 1 Introduction

This thesis is a product development-based thesis. The topic of the thesis is “Coaching Handbook for Goal Kicking in Rugby 15s and Rugby 7s”. The two kicks that are included as part of the study are the “place kick” in rugby 15s and the “drop kick” in rugby 7s. The place kick features only in the game of rugby 15s but the drop kick features in both games, however it is used more frequently in rugby 7s. The reason the author chose this topic is because kicking is a method used to score points in both codes of rugby union. The place kick can be used to convert a try (five points) for an extra two points or through a penalty kick for three points. The same applies to the drop kick in rugby 7s. The drop kick is used in open play by both codes to score three points, this is the most infrequently used kick as it is the most difficult and risky, although it is quite effective to score points during a slow period of play.

The output of the development task is a handbook that was created in this thesis. This will help coaches in the Danish rugby union to identify proper kicking technique in their athletes and give the coaches methods to coach their athletes in order to improve their performance. This information is important for the commissioning party as it is currently trying to become promoted in the Rugby Europe Championship in both 15s and 7s. The union is hoping to qualify for the Olympics in the future in rugby 7s and this product will aid them. The handbook will also help with teaching the next generation of national team players in Denmark.

The key objectives are to identify proper kicking technique, coaching cues to improve the kick technique, sport psychology exercises, and resistance training exercises for kickers through previous research. After this, a handbook is created using everything that is learned to help coaches in the future. The main areas of study that are covered throughout the thesis will be biomechanics, motor learning, sport psychology & product development. The main research problem is to identify the best kicking techniques for kickers using previous research as a guide, as well as other coaching that increase the athlete’s performance outputs. The information gathered during the study determines then how the guidebook looks like at the end of the study. Creating the handbook to be as simple and clear as possible is also a challenge. The handbook needs to be short and concise, so coaches do not have to read too much to familiarize themselves with the basics of both kicking methods.

The authors personal objectives during this thesis are to expand their knowledge of the theory involved with coaching kicking in rugby. The author wishes to work in professional rugby as well

as other sports in the future. Having specialized knowledge as a coach will elevate their chances at being employed in the future. The author also wishes to make working life connections throughout the thesis, the first being the commissioning party, DRU. Having these working life connections will be crucial for networking and finding jobs after graduation. This thesis also gives the author an opportunity to learn new skills such as sport psychology. The author aims to work in high performance sport, and this is a good area to start their journey towards that.

## 2 Commissioning Party

The Danish rugby union (DRU) is the commissioning party for this thesis. The union was founded in 1950, although rugby was played in Denmark since 1931. The union consists of over 2000 members, in 30 clubs across Denmark, predominantly in the greater Copenhagen area. The Danish elite or national teams consist of the men's rugby 15s team, men's rugby 7s team and the women's rugby 7s team. The National teams all play in Rugby Europe's European championships, although in a lower division than some larger rugby nations. The union have great ambitions to reach the top division with all three teams. The 7s program has become more popular due to the addition of it to the Olympic games in 2016. This means 12 teams from across the globe can now become Olympians through the sport of rugby, which previously was not possible. DRU is an amateur organization with only a handful of paid employees in directorial positions. All coaches, players and support staff are amateur and play because they love the sport. (Om Dansk Rugby Union, 2022)

The DRU receive funding from the Danish sports council, but due to restrictions they can only spend their budget on development; therefore, there is a limited budget for their elite programs. Creating a handbook will help the DRU particularly at the elite end of the sport. If their coaches can have access to quality resources, it will elevate their knowledge of the game and help their elite athletes perform to a higher standard. Improving their kickers will improve their chances of scoring crucial points in games which will elevate them up the divisions in Rugby Europe. (Om Dansk Rugby Union, 2022)

### 3 Kicking in Rugby

#### 3.1 Rugby 15s place kick

The place kick is an important part of rugby 15s and kicking; particularly in tight fought international games it can win matches. 45% of points scored in international matches are scored through place kicks (Quarrie & Hopkins, 2015). The place kick is usually performed by the number ten which is named the “out-half” or “fly-half”. Other players can take the kick also, but it is generally considered the number tens responsibility. After a try is scored or a penalty is awarded, a kicker has sixty seconds to perform the kick, according to the laws set out by World Rugby, who are the International governing body of the sport. A place kick is performed by using a kicking tee to prop the rugby ball up in an upright or angled position. Kickers tend to set the ball up in an upright position and then tilt the ball forward to the desired angle. The seam of the ball will be set up in line with the direction of the kick, as the seam is the hardest part of the ball; therefore, kicking the ball here generates more power. A place kick is performed from wherever a penalty infringement is made or anywhere along a forward/backward line from where the ball is placed down for a try. This means that a penalty kick is a fixed position; however, for a conversion of a try, the kicker can be as close or far away from the try line as long they are along the line from which the ball was placed down. This gives the kicker the ability to choose whether distance from the posts or the angle of the posts is more important to them. These rules also apply for penalty and try kicks in rugby 7s. (Quarrie & Hopkins, 2015)

In this study, the author focuses on the angle of approach, distance from the ball for the plant foot, the angle of the hip (kicking leg), the angle of the knee (kicking leg), and the foot strike. This narrows the focus to five key variables. Having these areas to focus on will help coaches in narrowing down areas to improve their athletes, particularly if something is lacking in their performance.

To achieve the best kick, both in terms of distance and accuracy, the athlete must generate power through hip and knee flexion (Atack, 2016). The accuracy and power also come from trunk position, the plant foot and the angle of approach to the ball. According to the study conducted by Atack (2016), the most successful kickers positioned their trunk towards the right hand upright if they were a right footed kicker and vice versa for left footed kickers. Power was generated by the athletes by approach speed and angle, hip flexion, and positive knee flexion during the swing

phase of the kick. Flexing the knee joint positively allowed athletes to generate more initial foot velocity as well as having more control over the foot and its direction. This leads to greater accuracy in the kick as opposed to someone who does not flex the knee joint and generates power solely from the hip flexors. Another factor that can improve kick accuracy is longitudinal trunk rotation. The less rotation during the kicking phase the more accurate the kick. (Atack, 2016)

During Atack's (2016) study she found that the more successful kickers approached the ball from a wider angle than the less successful kickers, as well as planting their foot further away from the ball than less successful kickers. This allowed the kickers to generate more horizontal force which resulted in greater foot velocity and ball velocity. The results of this study allowed coaches to focus on certain areas of the kick to achieve greater performance. (Atack, Trewartha & Bezodis, 2017) These findings can influence the methodology of this study, as well as which key factors to focus on. Key factors include, hip flexion, knee flexion, trunk position & rotation, angle of approach, foot velocity, ball velocity, and the distance of the plant foot from the ball.

### 3.2 Rugby 7s drop kick

The drop kick is a kick that can be used in open play, both in rugby 15s and 7s, but in rugby 7s drop kicks are used to score penalties and conversions, rather than place kicks like in rugby 15s (Gill & Cronin, 2015). This is because of the fast-paced nature of the sport, meaning place kicks are outlawed as they take too much time to perform. There is little to no research on the rugby drop-kick, but the mechanics of the kick are similar to most other sports. The only difference is the timing of the kick as it must be dropped from the hands, touching the floor before it can be kicked. The drop kick is a static kick, meaning there is no run up. The player holds the top of the ball with both hands, then drops the ball to the ground. The player swings back the kicking leg and swings forward the opposite arm, opening the trunk. The chest always stays above the ball. The kicking leg then swings through and connects with the ball as it touches the ground. Some kickers like to take a three-step run in to the kick, others like to stay static. (Gill & Cronin, 2015)

The variables of the kick that the author will be focusing on are, starting position of the ball, timing of the kick, knee and hip joint angle, foot strike position. These will allow the author to find the optimum kick and teach some coaching pointers. This will be found through previous research on kicking in rugby, Australian rules football (AFL) and football as evidenced in these two studies by



Blair, Robertson, Duthie & Ball (2020) & Boyne, Simms, Van Dyk, G. Farrel, E. Farrell, McHugh, Wall, Mockler & Wilson (2021).

The biomechanics of a drop-kick are very similar to the place-kick. The only difference being that you must drop the ball from your hands and let it make contact with the ground before striking it. All procedures leading up to the kick will be the same as a place-kick. A 2-4 step run in will be used similarly to the place-kick. This will create forward momentum prior to strike. (worldofsportscience.com, 2021) Kickers should aim for the right upright of the post if kicking from the left side of the field using their right foot, and vice versa for the opposite side of the field. Body position, positive knee & hip flexion should be executed well during the kick as well as having the instep foot further away from the ball if previous kicks were inaccurate. (Atack, 2016) Ball speeds after impact of the kick should be similar if not faster than those of the place-kick (Ball, 2010). It is important to make sure the dominant hand which is the last to leave the surface of the ball before it drops stays out of the way of the path of the ball. If the dominant hand does not drop the ball smoothly it will result in reduced accuracy of kicks. (Pavely, Adams, Francesco, Larkham & Maher, 2010)

## 4 Coaching a Rugby Kicker

### 4.1 Strength and resistance training

Strength training is defined as any exercise that promotes muscle growth or strengthening of the muscles or joints. Resistance training involves adding weight or resistance to an exercise to make the exercise more challenging and promote more adaptations in the body. (Strength training for beginners, 2022)

Strength and resistance training can be an aid to improving kicking performance. In the handbook given out at the end of this thesis the author would like to have some recommended exercises that can be used to improve athlete's performances as well as how often they should do them. This will be helpful for the commissioning party and any coach that uses the handbook in the future. These exercises will be improving the speed of approach, leg swing speed, and foot strike speed of the athlete. This will lead to the athlete being able to kick the ball a greater distance, increasing the points scoring opportunities for their team. The exercises will also improve their motor control which will lead to greater accuracy in their kicks as well as fewer inconstancy's as shown in the study by Young & Rath (2011).

During a study on the effects of a ten week resistance exercise program on soccer kick biomechanics and muscle strength (E.Manolopoulos, Katis, K.Manopoloulos, Kalopotharakos & Kellis, 2013) the authors found that by following a resistance training program over the course of ten weeks, three times per week during the pre-season, there was an increase in ball speed numbers as well as an increase in the maximum speed of the lower limbs, an increase in vertical ground reaction force and other positive results. The resistance training program included various exercises to target specific muscle groups in the upper and lower limbs as well as some simulated kicking exercises, which in some cases included added resistance to the swinging leg using a resistance band. The increase in muscle strength aids in kicking performance and distance. (E.Manolopoulos, Katis, K.Manopoloulos, Kalopotharakos & Kellis, 2013)

In a study discussing enhancing foot velocity in football kicking: The role of strength training by Young & Rath (2011) they found that introducing loaded kicking exercises can increase quadricep strength which can lead to better performance. These exercises can be performed using a resistance band, loaded or weighted balls, or kicking in water. Plyometric exercises are also recommended to increase quadricep strength and increase performance of the muscles stretch

shortening cycle or SSC. Plyometric exercises such as the drop jump are recommended due to the turnaround between the eccentric to concentric muscle contraction phases. The SSC is important during a place-kick or drop-kick as it is a power-based exercise. The faster the SSC the more potential there is to generate more and therefore more ball speed and distance.

Periodization of resistance training is a key aspect of strength & conditioning. It is how you manage the volume, intensity & progression throughout a week, month, year or even four-year cycle. Understanding your athlete's level is key to knowing where to begin with your periodization but some key aspects will never change, such as repetitions, sets, recovery time. These numbers will be based on what adaptations you are trying to achieve from the training, where in a training cycle you are and what sport you are doing. (Bomba & Buzzichelli, 2022) For example, if you are training for hypertrophy, which involves increasing lean muscle mass, you would follow a procedure like this. In the preparatory phase of the year, you would have three-four sessions per week, with weight loads at 60-80% of your one repetition maximum (1RM), six-nine exercises per session, twelve down to six repetitions, with rest between sets of two-five minutes, and speed of execution of three-five seconds eccentric, one-five second pause between eccentric and concentric phases, and a fast concentric phase of one second as evidenced in the book periodization training for sports by Bomba & Buzzichelli (2022). These numbers will change depending on whether you are aiming for anatomical adaptation, hypertrophy, maximum strength, power, or maintenance. What will also change the numbers is which phase of the training year you are in. For example, preparatory, pre-competition, or competition periods. The volume and intensity during each of these periods will be vastly different and will have to be monitored closely by the coach. The team sport sessions periodization must also be considered when planning a resistance training program. An athlete must first focus on the team sport sessions before proceeding to do extra work like conditioning or resistance training. (Bomba & Buzzichelli, 2022)

## 4.2 Motor learning

Motor learning is a key factor in the success of any kick in sport, particularly in rugby. It includes various phenomena, such as low-level mechanisms for calibration of human movement, to making high-level cognitive decisions in a given situation as evidenced by Krakauer, Hadjiosif, Xu, Wong & Haith (2019). The repetition of an exercise as well as doing it with proper technique can make or break how an exercise is performed. The performance and success of an exercise is determined by doing the exercise in the optimal way with the least number of errors or

inconsistencies. Teaching or coaching an exercise like kicking in the correct manner using the correct steps can vastly decrease the inconsistency of proper technique and increase successful attempts.

One way of improving how to coach motor learning is through cueing (Čoh, Jovanović-Golubović & Milovan, 2004). Cueing involves using short phrases that are only a few words in length that describe the exercise in question. Cues can be internal or external. An example of an internal cue could be “bend your hips and flex your ankles”. This requires the athlete to focus their attention internally to reorganize their body to perform the exercise correctly. An example of an external cue could be “Push explosively away from the wall”. This requires the athlete to visualize performing the exercise using an external factor such as the wall. It also tells the athlete at what speed they should perform the exercise and in what direction. A great cue involves using both internal and external cues to make a sentence that tells the athlete what they should do physically, at what speed, and in what direction. An example of this could be “Flex your shoulders, bend your elbows and push explosively away from the wall”. Using cues like this vastly improve the athlete’s ability to be able to comprehend a new exercise and perform it successfully. It is also useful to remind an experienced athlete of how it should be performed in a simple way. (Čoh, Jovanović-Golubović & Milovan, 2004)

Motor learning divides muscle activity into stages (Čoh, Jovanović-Golubović & Milovan, 2004):

- The selection and innervation of those muscles necessary for the efficient execution of the movement.
- Sequencing (the correct sequence of muscle activation)
- Time structuring of the movement (the duration of the activity of an individual muscle during the entire movement)
- Gradation (varied application of the power of the engaged muscles)
- Timing (adapting the structure of the movement to external conditions)
- Alternative movements (selection of the optimal movement structure in view of the current situation)
- Movement control (movement automation and movement adaptation in non-standard circumstances)

For a motor movement to be memorised it must be defined as a “scheme” (Čoh, Jovanović-Golubović & Milovan, 2004). This “scheme” has four parts:

- Initial conditions such as information about the environment, the position of body parts, position of the tool (e.g. club, racquet, ball), the grip and balance of the body;
- Information about the speed, amplitude and force of the swing;
- Information about movement transmitted by kinesthetic receptors;
- Information about the reaction outcome in view of the set goal.

Using these four steps allows an athlete to memorize the exercise internally. This makes it easier to access the memory faster in the future. There are seven methods of teaching or coaching an exercise that involves motor control. These include the method of instruction, the demonstration method, the situational method (synthetic method), the analytical method, the complex method, the ideomotor method, and iterative method. (Čoh, Jovanović-Golubović & Milovan, 2004)

Slow motion demonstrations, feedback, cueing & differentiated instruction are all key aspects of getting an athlete to learn and perform a skill both accurately and correctly as shown by Moon (2022). Slow motion instructions should be performed to aid in the athlete's understanding of the action they are about to perform. This, along with directed verbal instructions will create a clear picture for the athlete on what the key aspects of the exercise are, what to focus on and how to visualise the movement. If an athlete is struggling to grasp the exercise you should have them perform it slowly and build up the speed over time to ensure they do the exercise correctly. You should however always perform the exercise at full speed prior to the slow-motion instruction.

Feedback is another key tool to use in motor learning. General-type feedback is given to the athlete to motivate them, (phrase like good job or nice work). A way to make this feedback clearer for the athlete is to give direction to the feedback. Instead of saying “nice job” say “nice job with the leg follow through”. This gives the athlete a better sense on what exactly you are praising. Augmented feedback is used to give information and feedback about the motor skill and helps with the athlete's own sensory feedback. The frequency in which you give very specific feedback will depend on the skill level of the athlete. If they are learning a skill for the first time it may take more augmented feedback to explain in detail what to do. When an athlete is already proficient in a skill, such feedback is required less often. This is where a coach has to decide when the best time is to give critical feedback. (Moon, 2022)

Differentiated instruction should be used in cases where you are coaching athletes of various skill levels (Moon, 2022). This could be in a youth team, or in a senior team where there are veteran players mixed with beginners. Differentiated instruction is based on the fact that everyone must be treated a certain way based on their own skill level. For example, a novice kicker may need more feedback and a hands-on approach compared to a veteran kicker that needs only a few feedback phrases per session. This is something that a coach must assess at the beginning of a session and even before if possible, in order to be best prepared for the scenarios that will arise.

### 4.3 Sport psychology

Sport psychology or performance psychology can be defined as the study and application of the psychological principles of human performance to help people consistently perform in the upper range of their capabilities and more thoroughly enjoy the performance process, as stated by Portenga, Aoyagi & Cohen (2016).

In a study done by Yahya, Ismail and Amer (2016), they found that PIM (practice in mind) showed an increase in the kicking performance of rugby players. Fifty-eight university males aged between eighteen and twenty-five were selected for the study. The tests involved the players mentally practicing ten kicks dressed in their normal rugby gear, two-three times per week for six weeks. They also measured their anxiety levels during the test. The test showed the players using PIM significantly increased their kicking success while also decreasing their anxiety levels during the kicks. (Ismali & Amer, 2016) This is one method that can improve kicking performance and mental attitude during the kicks.

Another method of sport psychology that can help kickers is performance tracking (Ismali & Amer, 2016). This involves writing down how each kick felt and what the end result is. This helps the athlete perceive how they are performing from a wider point of view. If they have a training session where they have not been kicking well, they can see from their performance tracking that the session is just an outlier. This prevents the athlete from having harmful negative emotions and reactions due to a bad session which could lead to the next session being sub optimal also. By seeing their previous progress, they can have confidence that in the next session they will improve once again. Writing down what felt good about a kick can help if the kicks begin to get sub optimal, because you can refer to what went right before and attempt to recreate that as evidenced in Hodge, Lonsdale, & McKenzie (2006).

## 5 Development Tasks

The purpose of this study was to create a handbook as the output of literature review on the topic of kicking in rugby 7s & 15s. The questions driving the research on this topic were as follows.

- How to identify and adjust kicking technique for optimum kicking performance?
- What other methods besides kicking can be used to improve kicking performance?
- How to create a handbook for coaches on this topic?

One task during this thesis will be creating an easy-to-use handbook to deliver to the commissioning party. This will have to be laid clearly to make sure each detail and instruction is clearly legible. It should pop off the page and not be overly complicated. I plan to keep the handbook short so coaches can carry it with them. The handbook will need to be lightweight but sturdy so as to not wear easily through a lot of use. The handbook should therefore be printed on a high-quality thick paper and laminated. If the handbook works in the intended way, it will be used by coaches in every kicking session they do with their athletes. This will help the coach to have a visual aid for the players when explaining the exercise as well as a verbal explanation. The more methods an athlete has at comprehending the information he is being shown, the more likely they will be able to perform that action without confusion.

The focus of development is on creating an easy-to-read coaching handbook that can be used across the DRU. This handbook will mainly focus on the correct technique for rugby place kicking and drop kicking, but it will also show other information such as coaching cues, strength training exercises for kicking and sport psychology exercises for kickers. This handbook should encompass many aspects of the art of kicking in rugby. By developing this handbook, it also develops my knowledge of the kicks and furthers my career as a coach and strength and conditioning coach. I would like to work in elite sport in the future and this will help my development as well as the coaches in the DRU.

## 6 Product Development Process

The Cambridge dictionary definition of product development is the process of creating or improving a product or service and managing it during all stages from design through marketing (Product development, 2022). The author plans to create a product for the Danish rugby union. The author will not partake in the marketing side of the product as it being given to the Danish rugby union so that they may pass it on to their coaches. The product will not be sold or distributed outside the DRU.

There are four principles of product development. The first being that the job of the designer is the create something that is desirable and transferable. This means that the product should be desirable to customers or consumers. The product should be then transferable into the production system where it can be produced to meet market demand. (Matson & Sorenson, 2020)

The second principle is that the design must evolve, gradually become better, more mature, and until it contains all the necessary information for the production system to manufacture the product and test its quality. This principle means that it the product will start with an idea, become verbalised, become a visual representation of the idea, then the idea will be given a formal description and will be revised countless times before there is a completed product.

The third principle is that the product development team causes design evolution through design activities that result in artifacts. This principle includes brainstorming, sketching, testing, and prototyping. These processes result in an ever-evolving design for your product. This is how a better and more reformed product is created.

Principle four“is optimal evolution requires customization and coordination of activities”. This principle is the organization of all the forementioned principles in a logical and smart way to optimize workflow. The coordination of activities leads to optimal outcome. This process has four main steps. Understanding of needs (talks with commissioning party, observation of target group), set of candidate solutions (brainstorming, sketching), defined design (modelling and experimenting), and a tested design (evaluation). These four theories are evidenced in the study done Matson & Sorenson (2020).

The product implementation plan of the handbook was as follows. The author continued to build their theoretical knowledge through July and August 2022. This theoretical knowledge included kicking, strength training, sport psychology and graphic design. The author planned to then write



the written part of the thesis in September before designing the handbook in October 2022. This plan allowed the author to finish the thesis within the allotted time set out by KAMK and their thesis supervisor. This timeline allowed the author to present their thesis before the end of the academic year.

Using the theory above by Matson & Sorenson (2020), the author planned to create a handbook that would be created specifically for the DRU and targeted towards coaches, thus making a product that is desirable and transferable. The process included gathering theoretical knowledge about the subject and target group, creating the handbook in a way that is logical and understandable, creating prototypes and refining the product through multiple passes.

The product was discussed with the commissioning party on multiple occasions throughout the process to ascertain what the party desired from the product. Initially the product was only going to contain kicking theory and motor learning, however through discussion, the commissioning party requested that resistance training & sport psychology aspects be added to the product. A wide information handbook was required and thus the product was refined to emulate that. The commissioning party requested the handbook be created through Microsoft word because it is the system used in the DRU. This will allow them to format and edit the product as they wish for distribution after the final product has been given to them.

After all theoretical resources were collected through the thesis process, the handbook began to be created. The author planned for the handbook to be no longer than 15 pages long as to maximize the efficiency and readability of the document. Careful organisation was called for to make sure the readability & clarity of the product were shown clearly. Multiple drafts of the handbook were created as the author refined the look and layout of the product. Doing this helped to create a better final product.

The reliability of the document is based on the previous research used to create it. No non peer reviewed papers will be used to create the handbook. All sources will be included in the written thesis. This will allow the users of the handbook to read the research themselves if they wish to do so. No information will come from a singular source. Information will be backed up by at least one or two papers based on the same topic. This will ensure reliability of the information in question.

The author plans to report the work by using the physical handbook as well as a survey the author will send to the commissioning party to measure their satisfaction with the product provided for them. The author will also ask the elite coaches in the DRU to fill out this survey, therefore the

author will have feedback from multiple sources. These sources will also be the people using the product after the author has completed it. This will be a good way of measuring the success of the thesis and product. Due to the timeline of the thesis process the author was unable to include the results of the satisfaction survey in the thesis and the survey will be sent out directly after the handbook and thesis are completed.

The final product was made into a word document containing theory on kicking in rugby 15s & 7s, motor learning, strength & resistance training, & sport psychology. The length of the handbook is 13 pages which is the length the author wished to achieve.

As the author is not collecting data from any parties during this thesis, no data privacy will need to be included, as well as data collection and storage methods.

## 6.1 Production manuscript

The handbook was compiled as a word document that is attached in the appendix of this thesis. The handbook is between ten to fifteen pages including topics such as how to coach the place kick & drop kick, as well as information on strength & resistance exercises and their periodization, some sport psychology exercises and how to apply motor learning to coaching new skills.

## 6.2 Choosing the topic

This topic was chosen because the author was a kicker in a rugby team for a lengthy period. The author started working with the Danish Rugby Union during January 2022 as a strength & conditioning coach. The author assisted in national team trainings and even coached some drop-kicking techniques to the players. This is where the author noticed a lack of fundamental skill level, even at the national team level in kicking. The decision was then made to create a handbook for coaches and players in the Danish Rugby Union to aid the process of gaining a greater skill level in all players across Denmark when it comes to kicking. Providing learning materials will help to guide coaches and players and give them a template from which to start learning to kick, as well as what to do in the gym and what to do to mentally improve as a kicker. The commissioning party

was interested in having a tangible product to give to coaches and players at the end of the thesis process. Therefore, the decision was taken to create the handbook.

### 6.3 Target group

The target group for this thesis was designated by the commissioning party. Rugby coaches and players from throughout Denmark will have access to the product. The reason this target group was selected is so that coaching knowledge and awareness can be improved throughout Denmark, therefore increasing the level of performance in the Nation all the way from youth to National team level. Coaches in Danish rugby are amateur, although they receive incredible training through World Rugby. Any resources that can aid these coaches will benefit rugby in Denmark. The DRU have an ambition to become a bigger rugby nation and therefore want to give their coaches and players the best resources, education, and support. This will aid them in climbing to higher divisions within rugby Europe both on the rugby 15's and rugby 7's circuit. There is also incentive for the rugby 7's teams to improve as if they can increase their level, they may receive support as a potential contender at the Olympics.

### 6.4 Limitations

One of the main research problems for this thesis topic is the lack of previous research on the drop kick in rugby. This means that data has to be pulled from other similar sports such as football, Australian rules football, Gaelic football, and Rugby place kicking. Overall, there is a lack of research on kicking and the phenomena around it in rugby. There are very few studies on the psychology involved with kicking in a game scenario and how to train the mind to overcome these obstacles, as well as specific resistance training that can be done for kickers in rugby. Much of the research for the sport psychology and resistance training theory was taken from research based on football. For example, the psychology behind taking a penalty kick.

These limitations affect the outcome of the product but are relevant to the topic at hand. Although, through the research conducted in this thesis the author has deduced that while football and rugby are different sports, the biomechanics, motor learning, psychology and resistance training involved are very similar if not the same. Therefore, the research used in this paper is a valid substitute for the lack of research available.

## 7 Discussion

### 7.1 Reliability

There are no similar products for place kicking & drop kicking that the author could research. Literature on the various areas covered in this handbook was used to back up the information provided in the product. The product will undergo a review by the commissioning party, and any alterations that need to be made will be done before the final product is submitted to the commissioning party. This topic could be researched further to make sure there is a reliable set of sources for rugby.

The authors prior knowledge from the sport as well as their knowledge from their studies at Kajaani University of Applied Sciences aided in ensuring the reliability of the research that was compiled in this thesis and in the handbook. Various theoretical sources were studied in a critical manner to ensure that the most useful, appropriate, and reliable information was obtained.

### 7.2 Ethics

This thesis was written following the code of ethics set out by both TENK (The Finnish National Board on Research Integrity) & ARENE (The Rectors' Conference of Finnish Universities of Applied Sciences).

All work has been written and created alongside the tutorage of a supervising teacher at Kajaani University of Applied Sciences. Procedures have been followed and approved by the supervising teacher. The thesis was written with integrity and transparency throughout the entire process. No work of others was copied or stolen during the process and all uncited ideas or concepts are the author's own. There were not many ethical challenges faced during this thesis as no data was collected and no interviews were conducted. All sources have been properly cited and referenced according to the guidelines set out by Kajaani University of Applied Sciences.

### 7.3 The product evaluation

The product is set to be evaluated through a survey sent out to the commissioning party. These results will not be available by the end of the thesis process as the commissioning party will need ample time to assess whether the product is a successful one or not. The survey will include questions to assess or evaluate the satisfaction level of the product from a coaching and player point of view. The survey will be given to the DRU technical director as well as the men & women's rugby 7s coaches to receive their expert opinion on the usefulness and validity of the product as well as their satisfaction levels.

### 7.4 Professional development

Prior to beginning the thesis process, the author had knowledge within the sport of rugby, both as a player and as a coach. The author previously played rugby with Youghal rugby football club and did an internship there as a strength & conditioning coach. During the authors practical raining period they worked as a strength and conditioning coach for the Danish rugby union. During this period the author also coached kicking at the national rugby 7s camps. This prior knowledge gave the author an aid when researching which aspects of the skill of kicking needed to be researched and made clear in the handbook. The theoretical research that was conducted during the thesis process further developed the authors prior knowledge in certain areas and helped to further their professional competencies. The theoretical knowledge was gained both through the thesis process, practical training periods and the studies the author undertook at Kajaani University of Applied Sciences.

It was challenging to find literature to support the real-world knowledge the author had gained in areas such as coaching, skill development, strength, and resistance training, & sport psychology. There was ample research on these areas but choosing the correct and most relevant information was a challenge during the process. The most challenging task was finding literature on the drop-kick as very little prior research had been done on the subject. This required the author the use literature that belonged to other sports with a similar style of kick. This was a good challenge for the author which further developed their researching skills.

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Appendices

Coaching Handbook for Goal Kicking in Rugby 15's & Rugby 7's



DIARMUID CLANCY

**COACHING HANDBOOK FOR GOAL**

**KICKING IN RUGBY 7'S & RUGBY 15'S**



SPORT & LEISURE MAN-  
AGEMENT  
THESIS  
AUTUMN 2022



KAMK • University  
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## 1 The Place-Kick

45% of points in international rugby matches come from place-kicks. This means that kickers should emphasize practicing their kicking technique regularly to perfect the skill and give their team the best opportunity to score valuable points.

### 1.1 Set-up

The ball should be set-up with the seam of the ball pointing towards one of the posts. For right footed kickers you should point the seam towards the far post when kicking from the left side, and the near post when kicking from the right side. The opposite applies to left footed kickers. The ball should be titled forwards so the kicker can connect with the bottom third or bottom of the ball. Once the ball is set up, take three steps straight back from the ball, in line with the post you are aiming for. The two steps to the left or right depending on your kicking leg.

### 1.2 Areas to Improve Accuracy and Power of the Kick

#### 1.2.1 Positive Hip & Knee Flexion

To generate the most amount of power the athlete must push through the ball with the hips, knee, and foot. This means the hips must pop, creating a positive angle between the torso and leg during the kicking action. This would look like the athlete standing taller as they strike the ball. The same is true for the knee. The lower half of the leg must swing through creating a positive angle at the moment of the foot strike. Doing these actions correctly will generate more powerful kicks and reduce inconsistencies.

### 1.2.2 Trunk Position

If kicking from the left-hand side with a right footed kicker, the torso should point and lean towards the far post. This has been shown to increase power and accuracy of kicks. If kicking from the left side with a right-footed kicker the trunk should face the left post. For a left-footed kicker it is vice versa. Trunk rotation speed can increase accuracy of the kick.

### 1.2.3 Approach Speed, Angle & Foot Strike

It has been proven through research that kickers that approach from a wider angle have greater kick success. If a kicker has a narrow approach angle, try widening it and see if there is any improvement. The faster the foot strike during the kick, the more power will be generated. This can be aided by having a faster approach speed. Quick and long powerful steps will generate more power through the trunk, hips, knee and foot.

### 1.2.4 Plant Foot Distance from Ball

More successful kickers tend to plant their foot further from the ball than others allowing them to create greater horizontal power with the foot strike. Play with this distance to achieve the optimum results.

## 2 The Drop-Kick

As with the place-kick the same factors affect the outcome of the kick. Although two additional factors must be looked at from a coaching perspective.

### 2.1 Ball Handling & Drop

The ball should be gripped with both hands either side of the top third of the ball. This means the ball has less distance to fall from the hands, reducing inconsistencies. The ball should be dropped slightly off the centre line of the body, on the side of the plant foot. As the ball is being dropped, the arm that is the opposite of the kicking leg will leave the ball to swing back and open the torso to generate power. The hand still on the ball should guide the ball as far down to the ground as possible without sacrificing posture.

Consistently dropping the ball in the same place will decrease errors and make the kick outcome more consistent. The spot in which the ball is dropped can be changed according to personal preference, as long as it is out in front of the body, just off the centre line toward the plant leg.

### 2.2 Kick Timing

The other variable that needs to be considered is the timing of the kick. The foot needs to strike bottom third of the ball on the seam the moment it touches the ground. This will make sure the kick travels at the optimum angle, giving the most distance. If the ball is allowed to bounce before the foot connects the kick will lose power and have a more vertical trajectory. This can be useful for a kick restart, but it is ineffective for goal-kicking.

### 3 Strength & Resistance Training

Strength & resistance training should be performed to improve the kickers stability, leg power and foot strike speed. This will improve the consistency of the kicks while improving accuracy and distance.

#### 3.1 Periodization

Periodization is a word used in strength & conditioning practices as well as general coaching. It describes the planning of training sessions in a longer period time. For example, a week, month, year, 4-year cycle. Periodization details the exercises, intensity, volume, frequency, and progression of exercises. Depending on what is needed from the training the periodization will be different. For example, maximal strength & power training have very different repetitions, sets & recovery times, as well as exercise tempos.

##### 3.1.1 Anatomical Adaptation (General Strength)

Training Parameter	Novice Athlete	Experienced Athlete
Duration of Anatomical Adaptation	6-10 weeks	2-4 weeks
Load	20 reps down to 8	12-15 down to 8
Buffer	1-2 reps short of exhaustion	1 rep short of exhaustion or exhaustion
No. of Stations per Circuit	10-15	6-9
No. of Circuits per Session	2 or 3	3 or 4

<b>Total Session Time</b>	<b>35-60 minutes</b>	<b>40-60 minutes</b>
<b>Rest Interval Between Exercises</b>	<b>30-90 seconds</b>	<b>30-120 seconds</b>
<b>Rest Interval Between Sets</b>	<b>2-3 minutes</b>	<b>1-2 minutes</b>
<b>Frequency per Week</b>	<b>2 or 3</b>	<b>3 or 4</b>

### 3.1.2 Hypertrophy

<b>Duration of Hypertrophy Stage</b>	<b>6-8 weeks</b>
<b>Load</b>	<b>60-80% 1RM</b>
<b>No. of Exercises</b>	<b>6-9</b>
<b>No. reps per set</b>	<b>12 down to 6</b>
<b>No. sets per session</b>	<b>10-12 (Split) or 18-24 (Full Body)</b>
<b>Rest Interval</b>	<b>2-5 Minutes</b>
<b>Speed of Execution</b>	<b>Slow eccentric phase (2-5 seconds), possible pause between eccentric and concentric, fast concentric phase (1 second)</b>
<b>Frequency per week</b>	<b>2-4 Times</b>

### 3.1.3 Maximal Strength

Load	70-80% 1RM (100% every 3-4 weeks for 1RM testing)
No. of Exercises	2-5 fundamental, 1 or 2 accessory
No. reps per set	2-6 fundamental, 8-12 accessory
No. sets per session	16-24
No. sets per exercise	3-8 fundamental, 1-3 accessory
Rest Interval	2-3 minutes fundamental, 1-2 accessory
Frequency per week	2-4 Times

### 3.1.4 Specific Strength (Power)

Phase Duration	3-6 weeks
Load	50-80% 1RM
No. of Exercises	3-6
No. reps per set	5-6 reps at 50-70%, 1-5 reps at 70-80%
No. sets per exercise	3-6
Rest Interval	2-4 Minutes
Speed of Execution	Explosive
Frequency per week	2-3 Times



### 3.2 Exercises to Improve Kick Performance

- Resisted kicks (Heavy Ball or resistance band)
- Hip Abduction & Adduction
- Knee Extension
- Knee Flexion
- Ankle Plantar & Dorsi Flexion
- Bar Squat
- Bench Press
- Nordics
- Deadlift
- Bar Calf Raises
- Hip Thrusts
- Drop Jumps
- Pogo Jumps
- Bounding
- Forward Lunge with Trunk Rotation
- Plank with Trunk Rotation (Add Resistance Band Pull with Upper Arm for more Difficulty)

Use these exercises along with the periodization provided. Use the periodization in accordance with the season schedule. For example, pre-season should be general strength/hypertrophy/maximum strength and pre-competition/ competition should be power.

## 4 Motor Learning

Motor learning consists of learning new movements or skills. As a coach you need to teach a new skill effectively or improve on skills that have been learned previously. There are various methods that can be used to aid in motor learning.

### 4.1 Cueing

Cueing is a method of describing how to perform an exercise using short sentences. These sentences help the athlete to understand what is essential to the movement. There are types of cueing. Internal and external.

- Internal cues require the athlete to focus their thoughts inward and focus on how they reorganise their own bodily movements. For example, "Bend at your hips and flex your ankles".
- External cues involve the athlete visualizing using an external factor to perform the exercise. For example, "Push explosively away from the starting blocks".
- The best cues will include both internal and external descriptions. The best cue will include a description of what the athlete should do physically, at what speed and the direction in which it should be performed. For example, "Flex your shoulders, bend your elbows and push explosively away from the floor".

### 4.2 Demonstration

Coaches should always demonstrate the kick at full speed before then demonstrating the action in slow motion. This allows the athletes to see what the action should look like, while also getting a breakdown of what should be done to perform it correctly. The slow-motion demonstration allows the athlete to comprehend the exercise in stages.

If an athlete is struggling with an exercise, have them perform it slowly and build up the speed over time with proper technique.

### 4.3 Feedback

Feedback is used to motivate an athlete and help them improve technically.

- General feedback is used to motivate an athlete and is intentionally vague. For example, "good job" or "nice work". If you want to clearer feedback, add direction. For example, "Nice job and following through on the kick".
- Augmented feedback is used to give feedback on the motor skill and give the athlete some sensory feedback. The frequency in which you give this feedback will depend on the level of the athlete you are working with. For example, a novice will require most time and attention, while an elite athlete will only require feedback a few times per session. This type of feedback will be more technical and critical and requires time to explain. Therefore, the coach must choose the optimal time to use this type of feedback.

### 4.4 Schemes

Schemes are a way for athletes to memorize the movement and practise it internally before performing it. Memorizing a movement in this way allows for an athlete to access the memory faster in the future.

- Initial Conditions (Environment, Body & Tool Position)
- Speed Amplitude & Force Involved
- The Movement
- Result of the Action in Line with the Goal

For a place-kick this would involve describing the pitch and weather condition, where you are standing at the beginning of the movement and where the ball is. Then describe how fast the action should be performed, followed by how to physically perform the exercise. After this describe how the result of the movement aligned with the goal "ball sailing through the post".

## 5 Sport Psychology

Sport psychology exercises can be used to improve focus, reduce anxiety, and improve consistency of kicking performance.

### 5.1 Practice In Mind Training

Practice in mind training involves mentally practicing kicks while dressed in the clothes you will wear during a game. This should be done 3 times per week for 10-20 minutes. Players must mentally picture the process of setting up the ball, stepping back and striking the ball through the posts from various positions on the field in various weather conditions. This aids in kicking performance while also reducing performance anxiety during games.

Players can also physically walk through the process without a ball or kicking tee. This must be done while visualising the kick and it being successful. This should only be done after practicing mentally for a few weeks.

### 5.2 Performance Tracking

Performance tracking involves keeping a diary of your kicking attempts in every training session and game and writing how each kick felt as well as the outcome. This will give you perspective on the improvements you have made over time. This will aid you when you have a bad performance. Being able to see the progress you have made and realising that one performance doesn't define your ability's reduces kicking anxiety and negative emotions.