



SAFE AND EFFECTIVE TECHNIQUES IN RUGBY – PRACTICAL GUIDELINES

Wayne Viljoen, BSc., BA Hons (Biokinetics), PhD, CSCS
General Manager: BokSmart National Rugby Safety Program
Sport Science Institute of South Africa (SSISA), Private Bag X5, Newlands, 7725
Tel. +27 21-659 5616, Email: wviljoen@ssisa.com, Fax: +27 21-659 5659

Paul Treu, M. Ed
Head Coach: Springbok Sevens
SA Rugby, PO Box 99, Newlands, 7725
Tel. +27 21-659 6700, Email: pault@sarugby.co.za, Fax: +27 21-685 3055

Balie Swart
Former Springbok prop, 1995 Rugby World Cup champion
Scrum Coach: 2007 Springbok World Cup champions
Sport Science Institute of South Africa (SSISA), Private Bag X5, Newlands, 7725
Email: balies@vodamail.co.za



Providing coaches, referees, players, and administrators with the knowledge, skills, and leadership abilities to ensure that safety and best practice principles are incorporated into all aspects of contact rugby.

INTRODUCTION

Rugby by its very nature is a contact sport, and with high impact collisions, there is always a risk of injury. It is extremely important to stress the point that players should be properly coached to play safe rugby, and this is especially important when teaching the correct execution in contact situations. Even more important is to highlight the fact that **safe rugby** is also **smart** and **winning rugby**. What this essentially means is that if you train and coach your players to approach contact situations in a safe manner, you will also be aiding your players to perform these tasks more effectively. By performing these tasks more effectively, you will ultimately improve individual player performance and indirectly boost overall team performance on the field.

THE TACKLE

In the modern game, one of the key causes of injuries is the tackle situation – the process of tackling and of being tackled. The majority of rugby injuries come from this aspect of play, and therefore one should address this component quite thoroughly. Coaches should practice the basics of tackling on a regular basis as it is a core rugby skill that one can only develop properly over time and through repetition. Humans are also creatures of habit, and by repetition, one can ensure that tackling becomes instinctive and can be performed safely and without excessive thought involved.

Track the attacking player

One should also note that in many cases tackles are not always executed badly due to poor tackling technique, but rather because the tackler was not in the correct position at the time of the tackle. Therefore an additional coaching emphasis should be placed on the correct tracking techniques when approaching a tackle situation. This technique allows the tackler to shepherd the oncoming attacking player and align himself better to make the tackle; and secondly, limits the space and choices made available to the attacking player. An example of this is the sliding defence pattern. This pattern involves running towards the attacking player's inside shoulder, and on approach shuffling sideways without crossing over the feet. A practical tip to prevent you from crossing your feet and being wrong-footed is to extend your inside arm towards the attacking player as you approach. Tracking on its own allows for a safer tackle situation, as the environment becomes more predictable, and allows you to become more dominant in controlling the tackle situation.

Head Position

One of the most important things to consider in the tackle situation is something that even the very best players at international level still have to work hard on, and this is your head position in the tackle. To drop your face, i.e. your chin towards your chest does two things that are bad for you. One is that the attacking player can change direction at the last minute and make your tackle ineffective, and two is that you place your head and neck in a risky position. It has been shown that the most severe neck injuries are caused by players dropping their heads and taking this forward flexed neck position directly into contact. To add to this, players frequently close their eyes AND drop their heads when going into a contact situation. Not only is this unsafe, it is not effective. What also happens when you drop your head and close your eyes going into contact? You cannot see what is happening...

During the tackle, you should never try to make contact directly with your head into the oncoming player, especially during a front-on tackle. You should try to align yourself properly to get your head on the outside of the attacking player. Some talk about getting “cheek-to-cheek” in the tackle i.e. your facial cheek against the bum cheek of the attacking player. This primarily indicates the safest height at which you should attempt to tackle an oncoming player i.e. around waist level with “cheek-to-cheek”. But what this also refers to is getting your head on the outside of or behind the oncoming player’s body during the tackle. One of the crucial mistakes players can make is getting their heads on the inside or “wrong” side of the tackle i.e. in front of the oncoming attacker’s body. This position places the head and neck in harm’s way, and increases the risk of head/neck injury and concussion substantially. The reason for this is that the head and neck, rather than the chest and shoulders, takes all the impact of the oncoming body on them.

Focus your eyes on the target

If you drop your face downwards you cannot see the attacker properly. Not only can this lead to a missed tackle, but also to injury. So keep your face up and focus your eyes on the oncoming player; even when you make contact try as best as you can to keep your eyes open and your face up. Drop your eye line rather than your head or shoulders! Many players have good footwork and can use this skill and other body movements as a decoy to distract and wrong-foot a defending player. This can lead to injury to the tackler via a bad body position during contact; to the attacker via for example a reflexive arm from the tackler; and/or lead to points against you – in all cases you lose! So here is a practical tip: keep your eyes focused on the oncoming player’s core or on the level of the navel. This will allow you to better identify the intended direction of where the player is ultimately heading towards and leads to an improved tackle response ability. No matter what they are doing with their hands and feet, you will have a better chance of defending and performing a safer tackle if you track the oncoming player by focusing on his core movements.

Spine in line during the tackle

To be able to generate sufficient force during the contact situation, you also need your spine in line during the tackle. The body and spine is most efficient and strongest when it closely simulates its natural position. For this to happen in the contact situation, your face should be looking up with the chin off the chest, your chest should be slightly pushed out, shoulders above hips, and the pelvis should be tilted slightly forward. This position of the head, spine and lower back allows you to get into a stronger, lower position before entering into the tackle, and drive more powerfully and more balanced when extending upwards and forwards to complete the tackle. By keeping the chin off the chest you also allow yourself the opportunity to sight your target better, position yourself appropriately, and compete for the ball better after the tackle.

Shorten your steps before contact

What you do with your feet is equally important. It serves no purpose to run full steam ahead at your attacker and simply be wrong-footed, beaten and have lost the contest. Firstly, close down the space by shepherding the attacker, and align yourself properly for the tackle. Secondly, shorten your steps as you approach the attacker, forcing them to make the next move. The shorter steps as you approach lessen the chance of you being wrong-footed and allows you to respond better to the player as they move. This reverts the pressure back to the attacking player in terms of deciding where to go. However, never simply wait for the player to come to you, as you have little to no control of the tackle situation. Once the player has begun to move and you have committed yourself to the tackle, dip the body late just before contact, step in close with the lead foot, take the hit on the chest and shoulder, and power drive through the tackle with the legs to complete the tackle. Never try to simply reach forward with the arms into the tackle; rather use the core and with your lead foot step in close to the oncoming attacker, and shift your whole body mass into the contact. This also makes the contact safer, more powerful and more effective. Additionally, never plant both feet before the tackle, as this reduces your power and ability to respond.

Keep your elbows and arms close to the body and thumbs up (boxer stance)

This is a frequently underrated component of tackling and does not always get the attention it deserves. When you tackle with your arms high up in the air and away from the body, you lose leverage in the arms. In other words, you have little to no power in the contact, and furthermore have no body mass behind the contact. Chances are you are not going to win the tackle situation and this also places you as the tackler at greater risk of injury to the shoulder and neck area. If you hold your elbows lower and closer to the body and your hands with thumbs up, you first of all improve the leverage of the arms in the tackle, and secondly, you create a larger surface area for contact by bringing the shoulder and chest

more into the hit. This makes the tackle safer for you, and also a more powerful one. Additionally your hands are now loaded and ready to work.

Arms in the tackle

Once you have made contact with the chest and shoulder, you have to use the hands and arms to secure the tackle. There are a couple of ways to do this. The most common approach is to punch the arms forward, wrap them around the player and pull the player in tight. By pulling the player in tight does not mean that you go backwards, but as you pull the player in, at the same time drive through the tackle with the legs to ensure that you win the tackle contest and that the player does not get away from you. The key to this process is to avoid separation between the tackler and the attacker, commonly known as “hit-and-stick”. The other approach is to use the one arm to pull the player in, and the other arm to pull the one leg of the attacker in and destabilise him, while performing the leg drive and secure an effective tackle.

Key points during the tackle:

- Track the attacking player –
 - Stay square to your opponent for as long as possible
 - Run towards your attacking player's inside shoulder
 - Deny them space
 - Shuffle and do not cross your feet
- Keep your face up during the tackle
- Keep your eyes open and sight your target
- Focus on the core of the attacker
- Keep your spine in line
- Align your head outside of the tackler and not in front
- Shorter, faster steps as you approach
- Keep your elbows low and hands up (boxer stance)
- Dip and step into the tackle with the lead foot

- Punch and wrap the arms (hit-and-stick)
- Maintain leg drive into the tackle
- Once on the ground, regain feet quickly
- Compete for the ball

The FRONT-ON tackle: The abovementioned steps are especially important when it comes to the front-on tackle as your body takes more impact and the hit is usually harder than the side-on tackle or tackle from behind. The idea here is ideally to direct your tackle approach to come in at an angle of between 15-45° to the oncoming attacker and thereby reduce the force of the impact on your body, while still making your tackle more effective.

The SIDE-ON tackle: The side-on tackle is safer and less confrontational when it comes to impact and the risk of injury to the tackler, but at the same time the body positions and general techniques discussed above should apply.

The SMOTHER tackle: The smother tackle is an advanced tackle where the tackler is more upright in defence and attempts to wrap his arms around the ball and the attacker's arms. The idea is to prevent the player from being able to release the ball. There is no difference in the way that the tackle is approached or taught, and the same steps are followed as mentioned above. However the tackle is performed at a target aimed above the waist level, and below shoulder height. This form of tackle is not recommended for younger and less experienced rugby players, as it is more confrontational and the risk of injury is higher. As players become more skilled, proficient, better coached in rugby and have sufficiently mastered the normal tackle, which occurs around waist height, only then should they attempt to use the smother tackle.

BALL CARRIES INTO CONTACT

Evasive running

Injuries in rugby are not only limited to the tackling player. Injuries to the ball carrier contribute substantially to total rugby injuries. Therefore when trying to make the game of rugby safer for all, one should attempt to play clever rugby when taking the ball into contact. What this means is that you do not always have to crash it up and try and run through or over players. The more you do this, the greater the toll on your body and the greater the chances of getting injured. On top of this, if the opposition is wise to your tactics, they can defend this situation easily and neutralise your attack. If your aim is to run through or over your opponents, all they have to do is wrap their arms around you and the ball, and ball

possession is lost, slowed down or turned over. Players try to look for far too much contact! This is not clever rugby.

If you play clever rugby you utilise your rugby skills to avoid unnecessary contact situations, and to breach the defensive lines by putting yourself or your support players into the gaps. In the modern game this has not become easy, as defensive tactics have become a large focus of the game in recent years. Every player should be taught to identify their opposition's weak shoulder, i.e. the side they do not present in the tackle. Once you have learnt to identify this, it allows you to exploit your opponent's weak shoulder, run an evasive line and break through the tackle or breach the tackle just enough to set up one of your support players. This should be your primary objective, as evasive running lines provide greater opportunities on attack, and hold less risk of injury to the ball carrier during contact. Other key factors are to look for the defending player potentially overrunning the attacker with his shoulders facing square to the touchline. This situation also creates the opportunity to attack the weak shoulder and wrong-foot the player.

However, contact forms an integral part of the game and in some cases is unavoidable. The following section explores taking the ball into contact safely and effectively. Remember, safe rugby is effective rugby!

Carry the ball in two hands

Carry the ball in two hands when approaching the defender. The key to this strategy, other than protecting the ball, is to be deceptive and to create uncertainty. Sometimes during the game you might have the ball tucked in under the one arm and this might have value when carrying the ball into contact in a side-on tackle. But carrying the ball in one hand provides you with fewer opportunities in a front-on tackle situation. Also, with two hands on the ball there is far less chance of dislodging it in the contact and losing possession.

Face up and eyes open

When carrying the ball into contact, make sure that you have your face up and your eyes open. As described in the tackle section, this head and neck position when going into contact also reduces the chances of severe head and neck injuries.

Many injuries occur as a result of the ball carrier not expecting a tackle or being in the wrong position during the tackle. Having an acute awareness of your immediate surroundings and incoming defenders can quite substantially reduce the chances of picking up a severe head or neck injury. Alternatively, having an acute awareness of line-breaking opportunities and the position of your support players can

have an immense effect on the outcome of a game. It is therefore of utmost importance to have your face up and eyes open when going into contact.

Take small steps on approach

Take small steps when you approach the defender, as this allows you a few functional benefits. It allows you to change direction more effectively should you choose to or have to. It allows you to direct and apply your body position and therefore force better into the hit. It also provides you with more stability going in, which makes the ball carry both safer and more effective.

Maintain a low body position

Moments before you make contact, while maintaining your spine in line and face up, drop your body position to come in angling from low to high. This brings your centre of gravity closer to the ground, increases your stability in contact and allows you to generate more force.

Focus on the point of contact

When approaching the tackler it is vital that you decide on where you make contact with the oncoming defender. As you approach the defender, focus on the point of contact to ensure that your opportunity for ball retention, ball presentation and a safe contact situation are optimal within the existing circumstances.

Take a wide power step into contact

Once you have dropped your body position, step in close with the front foot, and drive forwards and upwards with a wide power step into the contact. This broadens your base of support, keeps you well-balanced and affords you a better chance of keeping your footing.

Make contact with the hard parts of the body

Angle your point of impact with the tackler to make contact with the harder parts of the body, i.e. the presenting hip or shoulder and not offering your whole torso front-on. This also allows you to shift and protect the ball on one side, placing your body between the tackler and the ball, and reduces your chances of injury.

Protect the ball

A key part of the game is to maintain forward momentum, and retaining possession of the ball is paramount for this to happen. How you carry the ball into contact is crucial to maintaining possession. If you LOSE the ball, you cannot score! If you HAVE the ball, the opposition cannot score. So, when carrying the ball into contact always put your body between the defender and the ball. What this means

is, from a front-on tackle perspective, bring the ball to the side furthest away from the defender when making contact, and pull it tightly into the body. From a side-on tackle this might also mean tucking the ball under the arm furthest away from the defender, but once again this runs a greater risk of losing the ball during contact.

Drive through with the legs

Once you have made contact it is crucial that you maintain forward momentum to improve your chances of ball retention. Continue to try and protect the ball, stay on your feet and power drive through the tackle with the legs.

Present and transfer the ball when appropriate

When the situation allows, present the ball to your support player appropriate to your existing circumstances. Most often it would mean bringing yourself and the ball to the ground, recoiling and presenting it backwards to your oncoming support players. When you bring yourself and the ball to ground, never try and break the fall on an outstretched arm or hand as this can lead to quite severe upper limb injuries. Always pull the ball into the chest with the arms, and present the hard parts of the body side-on to make first contact with the ground, before recoiling and presenting the ball.

KEY POINTS DURING BALL CARRIES:

Pre-contact

- Do not look for unnecessary contact
- Run evasive lines:
- Look your defenders in the eye to engage them
- Identify the defender's weak shoulder
- Look for the defender's feet crossing over
- See if the defender plants their feet
- Look for exposed or out of shape defensive lines
- Exploit available options

In contact:

- Carry the ball in two hands

- Keep your face up and eyes open
- Take small steps on approach
- Maintain a low body position
- Focus on the point of contact
- Take a wide power step into contact
- Present the hard parts of the body to the tackler
- Protect the ball
- Drive through the tackle with the legs
- Present and transfer the ball when appropriate

THE SCRUM

The scrum can effectively determine the outcome of a match, as it plays a vital role in one side gaining ascendancy over the other. It is for this reason that so many teams have built their structures and game plans around this facet of the game. It is also one of the key ways of restarting the game after a stoppage in play. Scrumming historically has the highest risk for serious and/or catastrophic head/neck/spinal injuries if performed incorrectly. Much of this risk can be reduced through adequate coaching and education, physical conditioning, technical preparation, and scrumming experience. A significant amount of time should be spent on the correct technical aspects of scrumming, as effective scrumming technique is also safe scrumming technique. So it essentially lends itself towards focusing training on safe scrumming techniques, as a safe technique should enhance overall scrumming ability and therefore ultimately team performance. The difference between good and bad technique can have a major effect both on performance and injuries. Coaches play a major role in injury prevention during the scrum, by teaching, training and enforcing proper scrum technique in their players. This is especially important taking into account the high risk of catastrophic head/neck/spinal injury during scrum collapse. This implies that regular dedicated and focused training should be focused on the various safety and performance aspects of the scrum such as:

- The **correct body position** in the scrum, i.e. head position, spine in line, hips and shoulders square, body weight distribution over the balls of the feet, shoulders above hips, pelvic position and its influence on posture and force development

- The **setting of the scrum**, i.e. foot position, distance from the opposition, correct binding, the referee's cues, your alignment relative to your opposite number, weight distribution, sequence of building the scrum
- The **scrum engagement** i.e. timing issues related to the referee's call of "crouch-touch-pause-engage", binding, building confidence in engagement, building the scrum during training sessions
- **Training progressions** and scrumming on machines vs. live scrums

Safety in the scrum should always be the main focus of any coach at any level of play!

BODY POSITION

This is a large part of scrumming that does not get enough attention. Coaches do not spend time on teaching this fundamental part of scrumming, yet this greatly affects the force generating capabilities of scrumming as well as the safety of the player.

Face up and eyes open

As with the tackle, it is important to keep your face up and eyes open when setting the scrum. Here it is imperative that you do not extend your neck too far backwards or alternatively drop your head too far forwards - this is especially important in the front row. Both extreme neck positions are not normal postures for the neck, and both hold an inherent risk of head/neck/spine injury.

Trying to teach the optimal head and neck position in the scrum can be quite simple to explain. Performing a couple of simple drills can make the picture very clear. Get the player to crouch down into the set pre-engagement position. Ask him to lift his head up. Keep his head in the achieved extended position and stand him upright without resetting the head and neck. You will notice that the neck is now severely overextended compared to normal posture, which is not a safe position for contact.

On the flipside of the coin, most players will drop their heads during pre-engagement, and then further flex and rotate their heads to the side during the scrum. This position holds a severe risk of serious and/or catastrophic head/neck/spine injury, especially if the scrum collapses.

One easy way of demonstrating the correct head and neck position for the scrum is to use a pair of sunglasses. Provide the player with a pair of basic sunglasses and ask him to put them on. Then ask the player to crouch into the set pre-engagement position. Ask them to lift the face up (rather than head up) until they can just see over the rim of the sunglasses. Perform the same exercise in getting them to stand up without releasing the achieved head or neck position. You will find them standing with their head and

neck in a good, strong, normal or slightly extended neck position. This position reduces the risk of injury during engagement and potential scrum collapse and should be the recommended position of choice.

Spine in line

There are a couple of ways of teaching this and both are centred on the position of the player's pelvis. This is such an important part of scrumming, and should be given close attention during training. In a normal body posture, your pelvis has a slight anterior/forward tilt - your back is slightly hollowed. An analogy would be if your pelvis was represented by an upright full glass of water. If you tilted your pelvis forward, the water would spill forward and onto your toes. If you tilted your pelvis backwards, it would spill onto your heels.

To reach the correct set, pre-engagement, bottom of the squat position and not put your lower back and spine at risk, you have to be able to flex or bend properly in both your hips and your knees. Body posture can either restrict or enhance natural movement, and this is extremely important regarding scrumming posture. Why is this important? If the pelvis limits the forward bending movement of the hip required in squatting, the body has to compensate by bending forward elsewhere.

To demonstrate this point, tilt your pelvis posteriorly/backwards (pour water onto your heels), squeeze and tighten your buttocks and curl your tailbone forward. Now try bending forward and squat down into the pre-engagement position. In trying to perform this, bending forward in the hips is limited, and the lower back and spine has to compensate for this. Therefore with the pelvis tilted backwards, your lower back and spine unfortunately have to bend forwards to compensate for this restriction in hip movement. Not only does this put your lower back at risk, it does not allow you to set and lower yourself properly to take the hit effectively during the engagement. In other words, you set up and engage in the scrum with a rounded "hunch-back" position and also take the hit coming downwards and from a greater height. This makes it difficult to keep your face up, raises your hips above your shoulders in the scrum, shifts your weight to your heels, and puts you off-balance. This body position is neither effective for force generation in the scrum nor for prevention of lower back/head/neck or spine injuries. In fact it increases the risk of injury, is very ineffective for competitive scrumming and can lead to scrum collapse.

Now try the same trick by hollowing your back and tilting your pelvis forward (pouring the water onto your toes). You should have an easier and increased range of motion. In other words you can set and lower yourself better and more effectively for pre-engagement, and your spine will remain slightly hollowed. This body position will allow you to maintain the appropriate face up position, to drive from a low body position forwards, and be able to generate more force in the ensuing engagement and scrum contest. To ensure the correct technique of setting the scrum into the pre-engagement stance, one should focus on pelvic positioning and also on bending both the knees and hips. A great practical cue when setting or

squatting down is “knees then hips”, i.e. first bend your knees and then bend in your hips. Alternatively, some may also respond to the “hips then knees”. Whichever works, both should be bending simultaneously to set the scrum to allow a more effective and safer body position before engagement. The correct setting of the spine for engagement is frequently referred to as “spine in line”, and should be a key focus in safe scrumming.

Another easy way to teach this is to get your player onto all fours, i.e. on hands and knees. Most players will have a rounded back in this position. Perform the same concept as above in getting the player to tilt their pelvis both backwards and forwards. While performing this on hands and knees, the back will round/hunch up with the backward tilt and arch/hollow with the forward tilt of the pelvis. You as the coach can better manipulate the pelvis to demonstrate this effect, as some players struggle to understand the difference between rounding and hollowing their backs. A useful tool is to perform this with a mirror to the side of the player, and get the player to look at the position of their spine after both manipulations. Once the player can see and feel when their back is straight and in line during four-point kneeling and associate the correct pelvic position, it becomes easier to transfer this to a standing or squatting position. Once they have grasped the concept on all fours, progress to performing the same cues during setting in a standing position, and also get them to look at their position in the mirror. Then functionally reinforce what has been learnt during the “crouch and hold” procedure. This is probably the easiest method to make players understand what is meant by “spine in line”. To maintain the “spine in line” and keep the scrum straight it is imperative that the front row forwards keep their hips pressed tightly together at all times!

Keep hips and shoulders square

This is equally important in terms of safety and scrum effectiveness. Once your players understand the correct head position and spine in line concept, the next focus should be on keeping the hips and shoulders square. What this essentially means is that if you proverbially balanced a full bath of water on your back, the water should not spill once you have set your hips and shoulders correctly. Your shoulders should be slightly higher than your hips but not more than approximately 5°. If you are set with your shoulders too high then you end up scrumming too far upwards and the force generated is lost, plus you run the risk of injuring both you and your opposition’s head and neck during the ensuing engagement and scrum contest. Also, you should try and keep both of your shoulders square to each other, because if you pull down, rotate and drop the one shoulder to the side, this reduces the stability of the scrum, is illegal, can also lead to scrum collapse, potential injury and is not very effective. Another way of ensuring that players stay square and strong in the scrum is by “barring-up”. To “bar up” means tensing and bracing the muscles of the core, head, neck and shoulders to prepare for impact. It also is a way of ensuring that the front rows remain more stable, solid and in contact with each other. Another

way of making the head and neck nice and strong during the “bar up” procedure is to push the tongue up against the roof of the mouth (palette).

Distribute body weight over the balls of the feet

For a more stable body position and effective force production during the scrum you need to shift your body weight forward onto the balls of the feet during the pre-engagement stance and the ensuing scrum contest. Grip the grass with your toes! When setting your pre-engagement stance and during the engagement or hit, you should try not to lift your heels off the ground, as this reduces balance and stability. An unstable scrum is a risky one, and as a front row, one should provide as much stability to the scrum as possible. This principle also holds true for the rest of the tight five! You should have enough balance and stability to be able to efficiently respond to the opposition or the demands of the situation and appropriately shift your weight to the left or right where required. Keeping your heels grounded and shifting your weight forwards onto the balls of the feet, provides you with this ability to respond, is safer and gives you more control over the ensuing engagement and scrum contest. For the correct posture and balance, at all times ensure that your chest is always centred on or slightly over your knees at the bottom “crouch” position.

SCRUM SETTING

Scrum setting is another component where body position becomes important. Once the basics of body position have been addressed, the finer details of setting the scrum come into play. The hooker should be the first player to set up his position. The first factor to consider is a safe distance apart from the opposing front row. This is usually about an extended arm’s distance away from your opposing scrum. Once given the mark, the hooker should take a tandem stance with one foot in front of the other, but feet should still be shoulder-width apart from side to side – this provides more stability. He should set himself and distribute his weight slightly more towards the front foot. The hooker should however not place the front and rear feet too far apart or else the front foot will act more like a hand break and thus limit forward force production. Also, for the sake of safety during the hit, the hooker must align himself appropriately according to his opposing hooker (right shoulder to opposing player’s head) so that there is no chance of a head-to-head collision during the engagement. Once the hookers are ready, bring in the loose-head prop, and the hooker should bind tightly, high up, but comfortably on the loose-head’s torso, with the loose-head binding low onto the hooker’s torso. Next bring in the tight-head prop with the same binding pattern, making sure that all six shoulders of the front row are exposed and facing squarely at the opposing team. Setting for the front row must be comfortable at all times. Next bring in the locks and flankers. Ensure that they inform the front row that they are coming into position by tapping them on the buttocks to open and let them engage without moving the front row. Thereafter, bring in the eighth man.

Take the crouch position, with the correct body position as discussed in the earlier section. The pack is now ready for the referee's engagement call!

ENGAGEMENT

This is something that should be trained more often, as a stable and coordinated scrum is a safer one, can provide great ball possession, and help gain ascendancy in the game. Timing and a well coordinated and synchronised effort can give a team the upper hand at scrum time. The only way to develop this timing is through practice. It is important therefore to heed to the referee's calls at scrum time and practice it in this manner. The referee will first of all call both forward packs to "crouch", whereby both teams will assume the pre-engagement position. The referee will then ask the front rows to "touch", whereby the opposing props will reach out and touch each other briefly on the outside shoulder. The referee can also use this as a gauge to assess whether the front rows are too far apart or not. If satisfied, he will then shout "pause". At this time, the whole pack should "bar-up" and squeeze together to prepare for the collision. It is important to hold your position and not to try and engage too early at this time. Do not look away from your opponent at any time, and if you are not ready, let the referee know, "not ready sir" and stand up before he calls the engagement. The pre-engagement process can be restarted if necessary – safety always comes first. If ready, the referee will then shout "engage", and the two packs will meet in contact. Scrum at the same height that you set up at! The tight-head props have to immediately reach out and over the loose-heads' arms, at the same height that they set up at, bind with tight grips onto the opposing loose-head props' jerseys in the middle lower-back region, and pull them in close. Simultaneously, the loose-head props have to reach out and under the tight-heads' arms at the same height that they set up at, bind with tight grips onto the opposing tight-head props' jerseys in the middle lower-back region, and pull them in close. Get your binds up immediately, and keep them tight until the scrum is complete. Maintaining the bind in this manner is critical for a safer, stable, well-balanced and more effective scrum.

SCRUM TRAINING PROGRESSIONS

An important part of scrumming is building confidence, and enforcing safe and effective technique. A major role in ensuring that this happens is a progressive exposure to what is required for scrumming. This is especially relevant to the front row. If you have a front row player that does not just have size, strength and good scrumming technique, but can provide additional stability to the scrum, you have a very special player. Other factors already discussed, such as body position, foot position and binding all add value in stabilising the scrum, but this is not all that is required. Core stability is essential for a powerful scrum and also for a safer scrum. Core- or local muscle stability refers to the corset function of the deep stomach and back muscles around the spine that keep your lower back and spine stable

during activity and protects them from injury. Training these muscles is essential in maintaining a healthy and uninjured spine, especially during scrumming. Local core stability training will be addressed in more detail elsewhere. Additionally, global core stability refers to the bigger and more superficial core stomach and back muscles that are used to provide additional stability to the spine when very heavy loads are being carried or lifted. These muscles come more into play in the scrum, as the body, lower back and spine have to tolerate high compressive and rotational forces. Before entering into the scrum it is always safer to undergo progressive training of your ability to engage these global muscles effectively during more functional scrumming movements. Good core stability also provides you with a more stable base to be able to produce more force.

A functional way of developing this aspect is to perform 1-on-1 scrums. At all costs, coaches must ensure during scrumming exercises and drills that players' legs are loaded at 120° knee angles, as this position generates the most force. Always try and reinforce the referee's call of "crouch-touch-pause-engage" during training, even in the 1-on-1 drills. This additionally helps develop timing. But before that, a nice drill to teach functional stability in the scrum is having 2 players starting on knees opposite each other. Get them to engage and bind properly. Once they have taken the hit and bound, ask them to scrum against each other. The focus of this exercise is to scrum and at the same time raise the knees off the ground, lower and repeat while remaining stable and in control at all times. Other key points are to maintain the head position, hips and shoulders square, shoulders slightly above the hips and the core muscles drawn in tight. How do you draw the core muscle in tight during the scrum? Focus on drawing your belly button (navel) inwards towards the spine and brace by tightly squeezing the muscles around the spine like a corset. Once you have managed this, you can progress to start from standing and work on the referee's call. Once you have bound you can then lower and raise your knees similar to the first exercise while scrumming 1-on-1.

A next progression is to perform 3-on-3 scrums, and this exercise is extremely valuable specifically for the hookers. It can be used in providing immediate feedback regarding technique, which can be invaluable in a team environment and for player positional development. Another progression is the 2-on-1 scrums. Here the 2 players are bound and provide about 90-95% resistance and the 1 player has to work and scrum them forwards for a specific amount of time, and then change over. Always reinforce safety and body position.

All of these can be used as preparatory exercises for scrumming for all forwards, and can also be used to progressively warm up players before a full pack scrumming session. One should spend more time on 1-on-1, 3-on-3 and 2-on-1 drills than the full pack of eight player drills, as the full pack scrums can

sometime become very messy. It is also recommended for especially the tight five to perform these drills more frequently, and before and after training sessions.

However, when packing down, one should spend more time on live scrums (2/3) than on machine scrums (1/3), as human unpredictability can never be completely simulated on a scrumming machine. Scrum machine training is more focused on teaching players timing and maintaining pressure on the opposition, whereas live scrums are much more to do with technique and reactivity. By training more on live scrums you improve both the safety and performance aspects transferred to the game.

As a general safety measure it has been recommended that players under the age of 19 perform less than 20 machine scrums per week, and that senior players perform less than 50 machine scrums per week.

When training on a scrum machine, always check beforehand to see that the equipment is in good condition and is safe for scrum training. Never start with the full pack of eight players straight away, as it is tough on the front row's bodies. Begin the session just with the front rows, then progress to adding the locks and flankers, and only then bring in the eighth man.

Key points during the scrum:

- Chin off the chest
- Face up and eyes open
- Spine in line
- Squeeze hips together (front row)
- Keep your hips and shoulders square
- Shoulders slightly above hips at all times
- Distribute your body weight over the balls of the feet
- Align yourself properly according to your opposition
- With “crouch”, bend in both the knees and hips
- Maintain the spine in line
- Maintain your hips and shoulders square

- When asked to “touch” and “pause”, hold your position
- Tongue on palette (roof of mouth)
- Bar-up (brace neck and shoulders)!
- Do not look away from your opponent at any time
- Draw your belly button towards your spine and activate the core
- Focus on your target area
- If you are not ready, let the referee know “not ready sir” before engage
- On “engage”, take the hit, but do not look away or drop the head
- Get your binds and grips up immediately, and keep them tight and up until the scrum is complete
- Drive from a low position forwards

LINEOUTS

The lineout phase when relating to rugby safety has traditionally not been a major source of serious and/or catastrophic injuries. However, if on a technical basis, they are not executed wisely and efficiently, the potential for injury is high, especially to the jumper. This has become far more prevalent in the modern game with the jumpers being lifted or supported inappropriately, or the support players being taken out of play by the opposition. Also, teams are competing far more strongly in the lineouts, as this has become a primary possession phase and great attacking platform within the modern game. When the jumper is in the air, and his supporters and/or technique are not up to standard, it is a long way down to the ground. If you have no control over how you come down, you can land in a spear position, which places your neck at risk, or you could land awkwardly and injure other body structures such as your back, foot and ankle, knees, etc. So paying some attention to and providing training on safe techniques in the lineout always has value. It is once again important to understand that in this instance, as with the other phases of play, safe technique is effective technique. So by practising safe lineout techniques, you are also improving your effectiveness during this phase of the game, which ultimately leads to better performance! It is a win-win scenario for all..

There are 3 main pillars that contribute to the lineout, namely the front lifter/supporter, the jumper, and the back lifter/supporter.

The Front Lifter/Supporter

With any lifting technique it is always important to remember that spine in line is a given. If you for example are lifting a 2 metre tall lock weighing 114 kg, you need a considerable amount of force and control. This is easily understandable if you put into perspective that you have to lift them, control them in the air, and ensure that they come down safely – all of this while your opposition are trying to destabilise you and contest with your jumper for the ball. So for the most control and strength in the lift, you need to have your spine in line together with a stable support base. A slightly arched spine and forward tilted pelvis allows you to generate force more effectively and is also safer for the back. Another practical issue is the issue of using the space you have to move more effectively. If you take up a strong lifting stance with face up, chest strong, spine in line, and a good strong leg position, you also allow the jumper to get in closer to you to attack the ball better. In this position your back is more upright, and less forward inclined. In terms of leverage, the closer the jumper gets to the front supporter, the less force is required to lift the jumper, and the less strain on the lower back of the supporter. This is purely based on movement biomechanics, so if you can allow your jumper to get in closer to you, you are firstly more effective in lifting and secondly at less risk of injury during the task.

Another important factor in lifting is, where do you support the jumper? Many players grab the shorts. Others support at the front of the mid-thighs. Neither of these techniques are effective and lifting at the front of the thighs is not that safe. Why? Because you have less control of the jumper, you generate less force, and you cannot lift them as high. If you are lifting while gripping on the front of the thighs, and the jumper moves sideways in the air, his legs will more often than not splay apart and this makes it more difficult for you to control and support him. An ideal grip for the front lifter is therefore a “vice grip” technique. This grip entails supporting at the same height on the thighs, but squeezing the legs together from the side in a “vice” grip. This hold on the jumper provides more stability and control of the jumper in the air, provides more control to the supporter and provides a safer lineout option. Additionally, it is a stronger grip and less likely that the hands will be knocked off by the opposition.

The Jumper

For an effective lineout jump, it has to be quick and decisive, with maximum power and to the ball. For this to happen, your jumping movement should not be excessive. To jump high and retain or compete for ball possession, you should utilise the space available to move very efficiently. If you dip too deeply before the jump, you negatively affect the space between you and your back supporter, as your buttocks will force him further away from you, and he needs to get in close to support you properly. Additionally, a deeper dip before the jump is a slower movement, takes more time and therefore also gives your opposing jumper more time to predict your movement and counter. This not effective rugby! So how do

you do this properly? Whether you are moving backwards or forwards into the jump, the principle is the same. You need to take a brisk step in your intended direction, and perform a quick dip and explosive jump using mainly your calf muscles and toes. The quicker the dip and jump movement, the greater the transfer of energy to the legs, and the greater the resulting power and therefore height of the jump. Because of the smaller range of movement in the dip, the back lifter can also get in closer and provide better support to the jumper. When the jumper takes off, he should jump upwards and at a 45° angle, i.e. rotate slightly towards his side of the field and the incoming ball. In other words, he should half-turn towards his scrumhalf during the jump. Why is this important? It makes it easier to off-load the ball to your scrumhalf or receiver once you have caught it in the air.

The Back Lifter/Supporter

The back supporter has an equally important role in the safety of the jumper. He needs to track the jumper as he moves. For this he should stand facing slightly towards his own tryline and ankle to ankle with the jumper, i.e. his inside ankle next to the jumper's outside ankle. This allows the back lifter to step in behind the jumper as he moves, and get in close. This ensures better control and force application, as described with the front lifter. As the jumper moves, the back lifter tracks him and steps in behind and at a 45° angle to the jumper to provide a stable support base. The same essential body position and lifting basics described for the front lifter holds true for the back lifter.

For optimal control and stability in lifting the jumper, you need to be able to stabilise the jumper from both sides. For this to be effective, you need an effective support position. The back lifter, as with the front lifter, should never grip onto the shorts, as this provides no security and stability in the jump. Nature gave us a natural seating platform to utilise, the buttocks, and this can be used effectively to support the jumper. As the back supporter steps in close, he steps in and places a hand on the back of each thigh, supporting just under the fold of the buttocks, and essentially provides a strong bucket seat for the jumper at the top of his jump. This together with the vice grip of the front lifter will allow the jumper to jump higher, provide a stronger and better support platform and allow both supporters to provide more stability and control to the lineout.

Key points during the lineout:

- During lifting from the front:
- Face up, chest strong and spine in line
- Get into a strong leg position
- Use your space effectively

- Step in close to your jumper
- Support the jumper with a vice grip on the outer mid-thighs
- Control the jumper back down safely to the ground
- During jumping:
 - Use your space to move effectively
 - Take a brisk step towards your support player
 - Dip quickly and not too deep
 - Jump explosively using mainly your calf muscles and toes
 - Half-turn towards your scrum half/inside half in the air as you jump
- During lifting from the back:
 - Face up, chest strong and spine in line
 - Stand ankle to ankle with the jumper and facing your try line
 - Use your space effectively
 - Step in close and at a 45° angle behind your jumper
 - Get into a strong leg position
 - Support the jumper with a bucket seat hold just below the buttocks
 - Control the jumper back down safely to the ground

RUCKS AND MAULS

The ruck and maul both have the potential to be a breeding ground for injuries if players firstly do not play according to the prescribed rules, and secondly, if these rules are not properly enforced by the referee. The ruck and maul is quite complex in terms of management, but players if properly educated can be effective AND safe in their approach to these phases of play, especially as they are intensive, and frequently involve high impact contact situations.

THE RUCK

A ruck is generally formed when the tackler, tackled player and ball are all on the ground, and when one or more of the support players from either side are on their feet and contest for the ball. An important point is that a player that enters the tackle situation has to enter from behind their own player and through what is termed the “gate”, and any additional players entering the newly formed ruck thereafter have to enter from alongside or behind their hindmost (the player in the ruck closest to their own try-line) player’s feet to contest the ball legally. The proverbial “gate” refers to the horizontal distance across the field extending between the outer most extremities of the two or more players involved in the tackle– the size of this gate depends on how the players fall to ground in the tackle. This is also a safety issue, as it deters players from cleaning their opponents out of the ruck from the side and “blind-siding” i.e. cleaning them out while being unaware of the potential contact or without them having a chance to see you coming and prepare themselves for the contact.

To contest the ball in the ruck, players should always weight bear on both of their feet and they should always be face up, spine in line, and with their heads and shoulders above their hips at all times. Dropping your head lower than your hips first of all does not allow you to see any of the oncoming players, and secondly increases the chances of severely injuring your neck, as any direct contact from a defending player can force it into extreme deep neck flexion with dire consequences.

As you enter into the ruck shorten your steps, make sure that you enter from behind or alongside your hindmost player, and target the ball. At the ruck some players are keenly contesting the ball and others are also cleaning out and attempting to drive any opposition players out of the formed ruck. When entering a ruck and/or trying to clean out an opposition player, as with the tackle contest always keep the spine in line, chin off the chest, face up and eyes open, and arms close to the body. Shortly before you make contact, dip slightly, step in close and make contact with the hard part of the front of the shoulder, and wrap your arms around your opponent. Continue to power drive with the legs from a low body position forwards and upwards. Always try and make contact directly below the player you are trying to clean out. Do not come from above and drive downwards. This is unsafe for both players involved. Because the incidence of head injuries in the ruck are increasing, it is important to train and emphasize the correct head and body position in driving out and cleaning out in the ruck.

THE MAUL

A maul is generally formed when an attempt is made to tackle a player; the player is not brought to ground, but is held up by one or more defenders. One or more of his own team's players may also bind onto him to contest and/or maintain possession of the ball. All players have to be on their feet and moving. Depending on the situation, the support players that enter into the maul should determine their purpose. If the ball is not secure, then they should attempt to secure it, provide additional leg drive and bind onto the ball carrier. If the ball is secure in the contact, they should target the ball, bind accordingly and move the ball away to the back of the maul away from the opposition. Ripping the ball away from the ball carrier and/or opposition, and transferring the ball away from the immediate threat, is something that should be taught separately. It is however important to teach this as mainly a leg based activity. At all times however, support players should be bound, and enter the maul from behind the ball i.e. from behind the last man's feet. When entering the maul, it is always important to stay on your feet and come in low, as the lower your body position and centre of gravity, the more power and stability to the maul. Also make sure that you are spine in line and head and shoulders above the hips at all times, and bound. Entering the maul from the side or trying to pull it down to ground destabilizes the maul and can lead to unnecessary injury of both the legal participants and/or the infringing player.

Key points during the ruck and maul:

Rucks:

- Always enter alongside or behind the last man's feet
- Do not charge in from the side
- Keep your face up and eyes open
- Sight your target
- Keep your spine in line
- Head and shoulders above hips
- Shorter, faster steps as you approach
- Keep your elbows low, hands up and arms close to the body
- Dip and step into the contact
- Enter from a low to a high position

- Make contact from below with the hard part of the front of the shoulder
- Wrap your arms around your opponent
- Continue to power drive through and clean out the player from the ruck
- Stay on your feet at all times
- Do not go to ground and prevent the ball from emerging

Mauls:

- Always enter from behind the last man's feet
- Do not charge into the maul from the side
- Keep your face up and eyes open
- Keep your spine in line
- Head and shoulders above hips
- Shorter, faster steps as you approach
- Keep your elbows low, hands up and arms close to the body
- Dip and step into the contact
- Enter from a low to a high position
- If the ball is not secure, attempt to secure it
- Bind onto the ball carrier and provide additional leg drive
- If the ball is secure, target the ball, and bind properly
- Attempt to rip the ball away and transfer the ball to the back of the maul
- Maintain your bind and provide additional leg drive
- Stay on your feet at all times
- Do not pull down or attempt to collapse the maul illegally

