ATTACKING AGILITY ACTIONS: MATCH PLAY CONTEXTUAL APPLICATIONS WITH COACHING AND TECHNICAL GUIDELINES

Abstract

Attacking agility actions, such as side-steps, shuffle steps, crossover cutting, split-steps, spins, decelerations, and sharp turns, are important maneuver in invasion team-sports, often linked with decisive match winning moments. Generally, the aims of these actions are to 1) evade and create separation from an opponent; 2) generate high exit velocities and momentums; or 3) facilitate a sharp redirection. However, these actions are also inciting movements associated with lower-limb injury. Given the importance of agility actions for sports performance and potential injury risk, in this review we discuss the importance and contextual applications of attacking agility actions, while providing coaching and technical guidelines to best optimize the performance-injury risk conflict.

Key words: change of direction; cutting; deceleration; turning; evasion; injury mitigation

Introduction

Attacking or offensive agility actions, in the context of invasion team-sports (i.e., court and field-based sports with the objective to score goals / points), can be defined as “distinct, sharp, change of directions (COD) or decelerations performed for attacking purposes (i.e., team in possession) while being actively defended by an opponent(s) (44). The overriding aim of attacking agility actions are often to gain territorial advantage to allow penetration of defensive lines and are often characterized by: 1) evasion, deception and space separation from an opponent(s), 2) timing and attainment of high sprinting velocity/momentum for collisions or various offensive plays (e.g., channeling, overlapping, driving, outruns); and 3) sharp changes of direction or speed that require skillful manipulation of the performers base of support [BOS] relative to center of mass [COM]) to attain rapid accelerations and decelerations (16) (Figure 1). For example, a rugby winger may perform a rapid deceitful side-step to evade and avoid being tackled by a defender (Table 1, Figure 1); in American football a rapid deceleration might be performed by a tight end to create separation and space from a defender to receive a pass from the quarterback (Table 2, Figure 1); or a soccer player performing a v cut (large redirection) to draw a defender out from position, to allow a team-mate to exploit the space (Table 2, Figure 1);. While these attacking agility actions may be performed in isolated scenarios (1 vs. 1 / 1. vs. 2), these maneuvers may also be performed in tandem with other attacking players in-order to destabilize defensive organization and create scoring opportunities (45, 83). Therefore, attacking agility actions are key movements associated with decisive and match-winning moments in invasion team-sports (41, 44, 85, 100, 105), and can be considered highly important attributes to develop.

Agility, globally, can be defined as “a rapid, accurate whole-body movement with a change of direction, velocity, or movement pattern in response to a stimulus” (64, 102). Whereas, gamespeed has been defined as “the ability to exploit the qualities of speed and agility within the context of a sport” (60). In the context of team-sport match play, the result of any agility action involves a perception-action coupling (91) in response to dynamic, constantly-changing scenarios that occur within the game (Table 3). For example, an Australian Rules Football (ARF), a ball carrier when visually scanning before and during the execution of an attacking agility action will process multiple stimuli, such as the team-mate options, location of goal, position and location of defender(s), the kinematics and body postures of the defender(s), and possible attacking spaces to penetrate. These actions will vary depending on an individual’s technical and tactical role within their given sport, such as the clear differences between a basketball center and point-guard with respect to the general locations they occupy and their tactical roles in the sport. Therefore, athletes need to be able to recognize and exploit game scenarios within their specific context to use effective movement skills within their physical capabilities (61).

Ultimately, optimizing agility development will require a specific understanding of the key tactical sequences (i.e., attacking transitions and routines) and movement requirements that support a team’s playing style to effectively carry out their game plan in match play (23). However, coaches tasked with physical preparation should seek to effectively characterize the components of agility in order to assess, train and monitor their athlete’s agility development. This approach may allow practitioners to reverse-engineer the requirements of their sport and identify the underpinning technical (i.e., way movement is performed / executed), mechanical (i.e., impulsive capabilities), physical (i.e., strength and speed capabilities) and perceptual-cognitive (i.e., fast thinking) factors that contribute to agility performance (24, 81). (24,81,94). This information can then subsequently be used to inform training interventions that target enhancement of agility performance. Although it is not disputed that perceptual-cognitive factors are highly important for attacking agility performance (due to perception-action coupling), developing an athlete’s technical, and mechanical abilities to perform the action (i.e., movement skill) in a rapid, controllable, and efficient manner can be considered integral factors for improving agility performance and mitigating injury risk in invasion team-sports (27, 33, 46, 47, 75, 81).

Agility and gamespeed can both be considered open-skills (i.e., affected by external stimuli in the environment) (13), and are independent qualities to COD speed, which is limited to pre-planned tasks (104). As mentioned previously, agility performance is underpinned by the interaction of perceptual-cognitive, physical, technique and mechanical factors. Crucially, these can all be viewed as qualities that can be trained in isolation or in combination in order to optimize agility and gamespeed development (29, 46, 47, 75, 91). For the purpose of this review, we will predominantly focus on "technique", which can be defined simplistically as "a specific sequence of movements" and "the way in which sports skills are performed" (69), or more complexly as "the motion activity specified by biomechanical principles of human motion which utilize motor features of movement and body structure to obtain the best sports result" (7). A plethora of different attacking agility actions are performed in invasion team-sports (44, 85, 100, 105), including side-step cuts, crossover cuts (XOC), split step cuts, shuffle step cuts, spin maneuvers, turns, and decelerations (Figure 1). Definitions and descriptions of these actions are presented in Tables 1-2 and Figure 1. In extreme circumstances, athletes may even jump and flip over opponents to create separation and avoid tackles, with famous instances observed in American Football; for example, Jerome Simpson scored a touch-down flipping over a defender on 12/24/2011. However, we will focus our attention on the technique of high-intensity locomotor activities that are commonly observed during match play in invasion team-sports. Importantly, the various attacking agility actions demonstrate kinetic and kinematic differences, and thus, have distinct implications for both agility performance and injury risk (33, 43, 53). These have been summarized in Tables 1-2 and Figure 1 based on previous literature (25, 29, 33, 34, 36, 43, 75).

Of concern, high-intensity agility actions such as rapid directional changes and decelerations are inciting movements associated with non-contact lower-limb injury (42, 62, 67, 68, 79, 90, 97), such as anterior cruciate ligament (ACL), medial and lateral ankle sprains, groin, and hamstring strain injuries. These events typically involve the ball / implement carrier with opposition players in close proximity and externally directed attention, evoking high cognitive loading (42, 62, 67, 68, 79, 90, 97). For example, a handball player focusing on defender(s) and goalkeeper's movements while performing a feint and side-step cutting maneuver to create separation to perform a shot. These agility actions have the potential to generate high mechanical loads which, if exceed the tissue's ultimate tensile strength capacity, can cause tissue (mechanical) failure and subsequent injury (3, 25, 39, 66). Mechanical loads can be further amplified when 1) movement quality (i.e., poor technique), neuromuscular control and biomechanical deficits are displayed and 2) during unplanned, externally directed / divided attention tasks where reduced preparatory times are evident compared to pre-planned tasks (1, 12, 59). Importantly, however, from an injury-risk mitigation perspective and maintenance of agility performance, it is well-established that these injury risk factors are modifiable through carefully designed, targeted training interventions (14, 25, 56, 82, 98). Consequently, understanding the techniques and mechanics of attacking agility actions that can optimize performance while mitigating injury risk is of great interest to practitioners working in invasion team-sports.

The purpose of this article, therefore, is two-fold: 1) to discuss the importance and contextual applications of the attacking agility actions for the invasion team-sport athlete; and 2) to provide technique and coaching guidelines for attacking agility actions that optimize performance and mitigate potential injury risk. A comprehensive overview of the descriptions, advantages, applications, coaching and technical guidelines, and injury risk and biomechanical considerations will be provided. This article will focus only on attacking agility actions in the context of invasion multidirectional team-sports (i.e., football codes, ball / implement carrying sports), whereby the sport's objective is to score points or goals in a pre-defined location, often by gaining territorial advantage, penetrating defensive lines, and evading opponents. This article should assist sports coaches, sports scientists, strength and conditioning (S&C) coaches, and sports medicine staff from all levels who are involved in field-based conditioning and who seek to develop their athlete's attacking agility within a holistically designed, multifaceted training program.

Insert Figure 1 here

Insert Table 1 here

***Insert Table 2 here**

Attacking agility actions: importance and contextual applications

A variety of agility actions are performed in invasion team-sports to accomplish the key aims of attacking agility (44, 85, 100, 105) (Table 1 and 2, Figure 1). Side-steps are the most frequently occurring attacking agility action in netball (44), and in 1 vs. 1 scenarios (74%) in

ARF (85), while also linked to tackle break success (i.e., penetrating defensive lines) (65.8-73.1%) in rugby union (100, 105). Shuffle and split steps, although not as frequently performed as side-steps in netball (and most likely other sports) (44), are an effective deceptive and evasive agility action, with greater decision errors made by defenders in response to these actions compared to side-steps (9, 18, 33). However, practitioners and athletes must be cognizant of the greater preparation times and subsequently smaller exit velocities when performing split and shuffle steps (9) compared to side-steps, and consider the trade-off between velocity and deception (33, 34). Thus, when travelling at moderate to high approach velocities, a side-step may be more advantageous due to the importance of velocity maintenance and shorter preparation times (33). Conversely, split and shuffles steps may be more suitable for scenarios at low to moderate approach velocities and isolated 1 vs. 1 scenarios where longer preparation time is afforded and when greater deception and feint maneuvers are needed. The velocity-angle trade-off would also infer that approaching at lower velocities will make it easier to perform an evasive and sharper directional change to create separation and increase tackle evasion success (i.e., tackled from an opponent(s)) (33).

Attacking agility XOCs are not as frequently performed as side-step agility actions in sports such as rugby union (100, 105) or ARF (85), nor are they as effective as side-steps with respect to tackle-break success (3.4-7.7% vs. 65.8-73.1%) (105). This is unsurprising, as XOCs would not be considered a deceptive maneuver due to limited head and trunk feinting movements. Additionally, medial foot plant across the midline seen during XOCs is not considered a deceptive “false step”, nor conducive for creating perpendicular force to redirect the COM sharply to create separation from an opponent(s) (33, 34). Conversely, the XOC is critical when a subtle COD and redirection is needed, with the aim to maintain velocity. Such actions are critical when channeling, overlapping and driving runs are deployed to 1) get into space to receive a pass, 2) create high horizontal momentum to break through tackles or lines in collision sports, 3) force opposition defenders to change position during diversion and decoy runs, or 4) perform a slight deviation in path where a curvilinear / curved sprint enables attainment or maintenance of high velocities (8, 15, 33, 34). However, because of the multistep nature of directional changes (33), a XOC is commonly performed following the main execution lateral step (i.e., side-step, shuffle, split steps – Figure 1) to help facilitate the redirection (21, 33, 34), and as such, is a highly important technical action to develop in invasion team-sport athletes.

An insufficiently researched but important agility action is the spin maneuver. To our best knowledge, Fox et al. (44) and Rayner (85) are the only researchers to quantify this action in netball and ARF, respectively, observing the occurrence of the spin maneuver to be the least compared to other attacking agility actions. Nevertheless, further research is needed to quantify spinning agility actions in other sports as they are often observed to be effective in maneuvering successfully through crowded spaces. For example, ball carriers in rugby codes, American football and basketball, typically aim to protect the ball on the 'blind side' by turning away from the defender, and successfully evade tackles and blocks by making themselves a smaller target. Practitioners must not directly assume and associate frequency with importance, and thus developing an athlete's agility literacy (e.g., movement solutions) will provide them with a greater arsenal of deceptive actions to perform within the contextual demands of the sport, making themselves more difficult to anticipate and less predictable to the opponent (33, 75).

An undervalued and underreported attacking agility action are decelerations, which can have critical roles in creating space separation from a defender (52, 53). This is exemplified by the much higher rates of change in velocity that are possible during decelerations compared to accelerations, making it possible for invasion team-sport players to change speed and direction in very short time frames and distances (52, 54). Figure 2 illustrates an offensive American Footballer who performs a high-intensity deceleration to avoid an opponent's tackle from the side, before changing direction and reaccelerating to maintain forward translation and territorial advantage. In this example, the space to attack the opponent on the inside whilst also avoiding the tackle would not be possible or as effective in players with a lower deceleration capacity. As such, a higher deceleration ability is central to reducing horizontal momentum and facilitating sharp angled directional changes ≥60° (28, 34, 36). To our best knowledge, Rayner (85) is the only researcher to quantify and contextualize decelerations as an attacking agility action, observing an ~8% frequency in ARF. Bloomfield et al. (6) reported that soccer players performed on average 9.3 decelerations per 15 minutes, with ~72% and ~96% lasting less than 1 and 2 seconds, respectively. Interestingly, Bloomfield (6) characterized the locomotor activities prior to and preceding the decelerations, reporting that soccer players perform decelerations from a variety of sprint velocities, and perform skips, shuffles, runs, and sprints following the decelerations across a spectrum of velocities. Moreover, a recent meta-analysis has highlighted that more intense decelerations occur more frequently than accelerations across a plethora of multidirectional sports (soccer, rugby codes, ARF, field-hockey) (52). CODs of 90-180° are frequently observed in ARF (85), netball (95), soccer (5, 86), and ultimate frisbee (92), whereby deceleration plays a fundamental role in facilitating the sharper directional change (28, 34, 36).

In addition to invasion team sports that involve an offside rule where the defender(s) is generally positioned in front of the attacker (i.e., rugby codes), attacking agility maneuvers that involve directional changes ≥90° are an important quality to develop in ball carrying sports where the ball can be passed in any direction 360° (generally with no offside restrictions excluding soccer) such as ARF (85), netball (95), soccer (5, 86), basketball, and ultimate frisbee (92). It is therefore imperative that athletes have the capacity to decelerate and turn effectively ≥90° due to the 360° directional change requirements in most invasion team-sports (34, 75). For example, in ARF, ~50% of the attacking agility events occurred with the defender at the side or behind the attacker (85). This can have important implications for attacking agility drill design. For example, it would be advantageous to increase the variation and contextual interference by altering the starting position(s) of the defender(s) to better reflect the multidirectional movement demands of invasion team-sports (85). In order to improve our understanding of the agility and contextual demands of invasion team-sports, and to better inform our training and testing of agility, further research is necessary which comprehensively quantifies and classifies the attacking agility actions in line with movement classifications presented in this review.

Insert Figure 2 here

Agility technique considerations: practical applications

Attacking agility actions are key movements associated with decisive and match winning moments in invasion team-sports (41, 44, 85, 100, 105). Agility movements are skills, and have technical, biomechanical, and physical determinants (75). Therefore, it is central that they are trained and developed as part of multi-faceted agility training framework by holistically developing athletes' perceptual-cognitive abilities, technique and mechanics, and physical capacities (33, 75, 81). While S&C coaches are primarily responsible for the physical preparation and development of athletes (24), an integrated approach across the multidisciplinary department to agility development is needed. For example, where possible, S&C practitioners are encouraged to work with the skills / technical coaches, biomechanists, sports medicine staff, and motor control / skill acquisition experts in a collaborative approach to most optimally design and program agility training methods. Accordingly, practitioners should design representative learning environments that facilitate effective transfer of physical capacity gains to on-field agility performances. For example, for practitioners who are limited with time for S&C and isolated agility training, one possible solution is to integrate agility drills into technical / tactical training sessions, or working collaboratively with the skills coach to help design sports-specific attacking agility drills and scenarios to promote agility, sports technique, and tactical development (77, 103). One such example is advising and designing small-sided games and attacking versus defending scenarios to provide the representative environments and constraints for agility development (77, 103). Additionally, integrating agility drills into warm-ups prior to technical or tactical skills training is also another opportunity to provide an agility stimulus, develop movement solutions, and modify athletes' technique (33) in line with guidelines presented in Tables 1-3. However, it is beyond the scope of this article to discuss agility programing and drill design, and thus, practitioners are encouraged to read the following literature for further information (24, 33, 77, 80, 81, 103).

The majority of attacking agility actions covered in this review involve a COD which is defined as a "reorientation and change in the path of travel of the whole-body COM towards a new intended direction" (20, 101) and often involves a break in cyclical running (75) (Figure 1). However, it is not disputed that accelerations, curvilinear sprints, and decelerations can in their own right be agility actions. Nonetheless, as agility COD technique is imperative for facilitating effective braking and propulsive impulse to move and redirect the COM laterally or horizontally for velocity maintenance, separation, or sharp redirections (33, 75), it is central to understand the mechanics and techniques which optimize COD agility performance (Tables 1-2). Agility actions that include a COD (Figure 1), generally, can be divided into four phases (33, 75) (Table 3):

1. Initiation: Linear / Curvilinear / Lateral motion
2. Preparation: Preliminary deceleration / preparatory postural adjustments
3. Execution: Main COD plant phase
4. Follow-through: Reacceleration

These four phases of COD will be influenced by the approach speed / velocity, athlete's physical capacity, COD angle, and the contextual and agility demands of the sport-specific scenario, with the biomechanical demands of directional changes angle- and velocity-dependent (33, 34, 75). For example, as intended COD angle increases, GCT during the main execution foot contact progressively increases to facilitate greater impulse (braking and propulsion) and COM deflection, while horizontal momentum must reduce in order to facilitate the directional change (34). Therefore, the deceleration requirements must increase (i.e., braking impulse), and thus deceleration mechanics play a critical role in facilitating sharp agility actions (34, 36, 75) (Table 2). Despite this, there is currently no research to our knowledge that has investigated how improving deceleration ability (i.e., the physical and technical components) could facilitate superior agility performance, and thus, is a recommended avenue for further research.

While approach velocity is a critical determinant of subsequent exit velocity during COD tasks (33, 34, 37, 49), practitioners and athletes should be conscious of the speed-accuracy trade-off, whereby greater approach speeds will make it more challenging to slow down and re-direct the COM sharply (34). This is pertinent whereby attackers must evade and create separation from an opponent(s) and re-directing the COM at a greater angle will be critical to avoid being tackled / blocked. Finally, these agility actions are typically performed over multiple steps, with the foot contacts preceding the main execution foot contact, such as the penultimate foot contact (PFC) (and potentially steps prior) playing a critical role in braking or preparing the main execution foot contact for effective weight acceptance and push-off (28, 33, 36, 87) (Tables 1-3). Additionally, because of the angle-velocity trade-off, full redirection and deflection of the COM cannot be achieved during the main execution step (19, 34), thus the following foot contact(s) are subsequently involved in redirection (21, 34, 87) as illustrated in Figure 1 and Table 3. As such, multiple steps are necessary to facilitate rapid decelerations, redirections, deceptive / feinting maneuvers, and reacceleration, and thus agility actions should be coached as a multistep strategy (Figure 1, Tables 1-3).

It is worth noting that while it will indeed be advantageous for athletes to be able to perform a plethora of different attacking agility actions (Figure 1), their ability to perform particular agility actions may be limited and constrained by their physical capacity (22, 63, 65, 94, 96), and the athlete's awareness of their own physical limitations (i.e., so called 'affordances' for action) could influence the attacking agility actions they decide to perform in sport. Thus, while developing technique and movement literacy is integral for attacking agility development, practitioners are encouraged not to neglect their athlete's physical capacity when modifying attacking agility technique. It is important that a multifactorial and holistic approach to the evaluation (i.e., needs analysis, qualitative and quantitative analysis of COD and agility, strength and power diagnostics) (33, 64, 81) and development (multicomponent model which targets physical capacities and impulsive qualities through a variety of training modalities, technique development, speed and deceleration, perceptual-cognitive factors) (33, 75, 77, 81) of attacking agility is adopted which is periodized and sequenced accordingly (33, 34, 77). Readers are encouraged to read the following articles for further guidance on this (33, 64, 75, 77, 81).

Agility "performance-injury risk" conflict: practical applications

While linked to decisive moments in multidirectional invasion sports, agility actions, particularly those which involve lateral foot plants, are injury inciting events associated with non-contact lower limb injuries such as ACL (17, 62, 68, 79), hamstring strain, medial and lateral ankle sprains (42, 97), and groin injuries (90), particularly in cutting dominant sports. Injuries to tissues occur because of a mechanical load which exceeds the tissues' tolerance capacity (39, 66, 78). When performing agility actions, potentially very high mechanical loads (25, 38, 43, 66), particularly knee joint loads, can be generated which are amplified when certain technical characteristics are displayed (25, 43), in conjunction with suboptimal movement quality and neuromuscular control (i.e., high-risk deficits), high approach velocities and sharper directional changes, and externally directed attention with high cognitive loading (12, 25, 27, 29, 31, 38, 43). As maximizing athletic performance which transfers to the pitch or court is imperative, mitigating injury risk and maximizing player availability (i.e., being able to field strongest line-up over the season) is also important for sports success, reducing negative financial implications, and promoting athlete welfare (40, 57, 82). Although injuries are a complex interaction of internal and external factors (4), movement quality and neuromuscular control and biomechanical deficits are modifiable risk factors (14, 56, 82, 98), and thus, understanding the optimal agility techniques to maximize performance while mitigating injury risk is of great interest to practitioners.

With respect to cutting agility actions, a "performance-injury risk" conflict is present (25, 29, 37, 43, 55, 76, 88), whereby specific mechanical and technical characteristics associated with superior exit velocities, deflections / redirections of COM, and deceptive movements are at odds with safer performance (i.e., reduced mechanical loads), such as wide lateral foot plants, reducing knee flexion and hip flexion, high impact ground reaction forces, and lateral trunk flexion and rotation (from a deception perspective). As athletes are driven by performance, athletes are less likely to adopt safer strategies at the expense of faster performance (37, 43, 55), which is problematic, as the aim of S&C is to improve athletic performance and mitigate injury risk (24, 37, 81). Subsequently, four viable strategies are available to mediate the potential “performance-injury risk” conflict during agility maneuvers: 1) reducing “high-risk” postures that offer no associated performance benefits (e.g., reducing knee valgus through resistance, neuromuscular control, jump-landing training) and improving preparatory postural adjustments (e.g. PFC braking and placement via technique modification training and eccentric strength training) (29, 37) (Table 1-3); 2) building physical capacity (rapid force production, muscle activation, neuromuscular control) and tissue robustness to tolerate and support the potentially large mechanical loads (e.g., multicomponent training program which integrates resistance, plyometric, balance and dynamic trunk stabilization training) (14, 26, 35, 37, 71-73, 82); 3) development of athletes perceptual-cognitive abilities and capacity to tolerate high cognitive loads (i.e., developing players situational awareness, visual scanning, anticipatory skills, and decision making ability and speed via agility training and feedback and video training) (48, 59); and 4) monitoring and periodization of high impact and high mechanically loading tasks to maintain tissue homeostasis (e.g., use of player tracking and / or wearable devices to monitor frequency and intensity of metrics such as of decelerations, accelerations and directional changes) (39, 66, 70).

Agility technical models and movement principles: practical applications

A “one size fits all” approach is unlikely to exist for optimal agility actions, and the optimal techniques are likely to be dependent on the intended movement, angle of directional change (if applicable), entry velocity, athlete physical capacity, sporting scenario and contextual demands (33, 34, 75, 81, 85). Movement variability (increased unpredictability and multi-dimensionality) and a dynamic coordinative approach may provide an athlete with greater flexibility and adaptability to environmental constraints and perturbations, potentially resulting in a greater capacity for task execution (50, 84). Furthermore, although an optimal zone of movement variability will likely exist (inverted u – “goldilocks effect”) (50, 56), in the context of injury risk mitigation, movement and coordinative variability may enable a more variable distribution of loading and stresses across the different joints and tissues, potentially reducing the cumulative loading on internal structures to maintain tissue homeostasis (2, 50, 51). Creating athletes who possess adaptable movement strategies and multiple movement solutions to solve the problems they encounter during the unpredictable and chaotic nature of multidirectional invasion sports will therefore be imperative from both performance and injury risk mitigation perspectives (33, 75). As such, the underlying agility philosophy is to create fast, robust, effective 360° athletes who are equally proficient at changing direction rapidly and controllably from both left and right limbs, across a range of velocities (low, moderate, and high velocities), with an arsenal of movement solutions (well-developed agility movement literacy) to perform a variety of agility actions within the contextual demands of the sport (Figure 1) (75).

A perfect agility technical model is unlikely to exist, as agility techniques will differ across individuals of different anthropometrics, physical capacity, perceptual-cognitive ability, skill level, and training history (33, 81). However, it cannot be disputed that there are key fundamental technical characteristics and biomechanical movement principles (Table 1-3), which are optimal and necessary to facilitate rapid, controllable, and effective attacking agility actions which should be adhered to when coaching agility movements (Table 3). Readers are encouraged to read the following articles for further information on the programing and training methods for agility enhancement (33, 75, 77, 81).

Insert Table 3 here

Conclusion

In this article we have provided a comprehensive overview of the various attacking agility actions and practitioners should acknowledge the advantages, disadvantages, contextual applications, and biomechanical considerations when coaching these techniques (Figure 1, Tables 1-3). Invasion team-sports are unpredictable and chaotic in nature, typically demanding athletes to continuously scan and process multiple stimuli (team-mates, ball/implement, defenders etc.). Because of this unpredictability, invasion-sport athletes require the ability to perform attacking agility actions within a 360° turning circle from both limbs. Therefore, it is integral to create athletes who possess adaptable movement strategies and multiple movement solutions to solve the problems they encounter (33, 75). Practitioners are therefore encouraged to follow the provided technical and coaching guidelines to develop their athletes attacking agility technique to best mediate the performance-injury risk conflict (Tables 1-3). This can be simply integrated into warm-ups, or most likely beneficially incorporated into technical-tactical drills, working in combination with skills / technical coach to increase sport-specificity, increase athlete / coach “buy-in” and adherence, and mitigate injury risk (30, 33, 36, 77).

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