

Supplementary table 1 - Injuries excluded during 'targeted injury' analysis summarised by injury site and injury type, displaying the number of injuries, the injury incidence rate (IIR) and 90% confidence interval (90%CI) for the Intervention and Control groups.

	<b>Control</b>		<b>Intervention</b>	
	n	IIR (90% CI)	n	IIR (90% CI)
<b>Head &amp; Face</b>	<b>7</b>	<b>0.72 (0.39-1.36)</b>	<b>8</b>	<b>0.81 (0.45-1.45)</b>
Eye injury	1	0.10 (0.02-0.54)	2	0.20 (0.06-0.65)
Fracture	4	0.41 (0.18-0.95)	4	0.40 (0.18-0.93)
Laceration	1	0.10 (0.02-0.54)	2	0.20 (0.06-0.65)
Undiagnosed Pain	1	0.10 (0.02-0.54)	0	
<b>Shoulder girdle</b>	<b>5</b>	<b>0.52 (0.25-1.09)</b>	<b>11</b>	<b>1.11 (0.67-1.83)</b>
Fracture	0		1	0.10 (0.02-0.53)
Haematoma	0		1	0.10 (0.02-0.53)
Ligament Injury	5	0.52 (0.25-1.09)	9	0.91 (0.52-1.58)
<b>Elbow</b>	<b>3</b>	<b>0.31 (0.12-0.81)</b>	<b>1</b>	<b>0.10 (0.02-0.53)</b>
Joint Injury	2	0.21 (0.06-0.67)	0	
Ligament Injury	0		1	0.10 (0.02-0.53)
Undiagnosed pain	1	0.10 (0.02-0.54)	0	
<b>Forearm &amp; Hand</b>	<b>6</b>	<b>0.62 (0.32-1.22)</b>	<b>8</b>	<b>0.81 (0.45-1.45)</b>
Dislocation	0		1	0.10 (0.02-0.53)
Fracture	6	0.62 (0.32-1.22)	4	0.40 (0.18-0.93)
Haematoma	0		1	0.10 (0.02-0.53)
Ligament Injury	0		1	0.10 (0.02-0.53)
Nerve injury	0		1	0.10 (0.02-0.53)
<b>Trunk</b>	<b>5</b>	<b>0.52 (0.25-1.09)</b>	<b>15</b>	<b>1.52 (0.99-2.33)</b>
Joint Injury	1	0.10 (0.02-0.54)	1	0.10 (0.02-0.53)
Fracture	1	0.10 (0.02-0.54)	2	0.20 (0.06-0.65)
Haematoma	0		6	0.61 (0.3 – 1.20)
Muscle Injury	1	0.10 (0.02-0.54)	2	0.20 (0.06-0.65)
Undiagnosed pain	2	0.21 (0.06-0.67)	4	0.40 (0.18-0.93)

Supplementary table 1 (continued) - Injuries excluded during 'targeted injury' analysis summarised by injury site and injury type, displaying the number of injuries, the injury incidence rate (IIR) and 90% confidence interval (90%CI) for the Intervention and Control groups.

		<b>Control</b>		<b>Intervention</b>	
		n	IIR (90% CI)	n	IIR (90% CI)
<b>Upper leg</b>		<b>4</b>	<b>0.41 (0.18-0.95)</b>	<b>4</b>	<b>0.40 (0.18-0.93)</b>
	Haematoma	3	0.31 (0.12-0.81)	3	0.30 (0.12-0.79)
	Undiagnosed pain	1	0.10 (0.02-0.54)	1	0.10 (0.02-0.53)
<b>Knee</b>		<b>4</b>	<b>0.41 (0.18-0.95)</b>	<b>9</b>	<b>0.91 (0.52-1.58)</b>
	Fracture	0		2	0.20 (0.06-0.65)
	Haematoma	2	0.21 (0.06-0.67)	3	0.30 (0.12-0.79)
	Laceration	0		1	0.10 (0.02-0.53)
	Undiagnosed Pain	2	0.21 (0.06-0.67)	3	0.30 (0.12-0.79)
<b>Lower-leg</b>		<b>2</b>	<b>0.21 (0.06-0.67)</b>	<b>1</b>	<b>0.10 (0.02-0.53)</b>
	Fracture	1	0.1 (0.02-0.54)	1	0.10 (0.02-0.53)
	Haematoma	1	0.1 (0.02-0.54)	0	
<b>Ankle/Foot</b>		<b>1</b>	<b>0.10 (0.02-0.54)</b>	<b>3</b>	<b>0.30 (0.12-0.79)</b>
	Fracture	0		2	0.20 (0.06-0.65)
	Laceration	1	0.10 (0.02-0.54)	0	
	Undiagnosed pain	0		1	0.10 (0.02-0.53)

Supplementary table 2 – Injuries included during ‘targeted injury’ analysis summarised by injury site and injury type, displaying the number of injuries, the injury incidence rate (IIR) and 90% confidence interval (90%CI) for the Intervention and Control groups.

	n	Control IIR (90% CI)	n	Intervention IIR (90% CI)
<b>Foot &amp; Ankle</b>	<b>14</b>	<b>1.45 (0.93 - 2.26)</b>	<b>7</b>	<b>0.71 (0.38 - 1.33)</b>
Dislocation	1	0.10 (0.02 - 0.54)	0	
Ligament Injury	13	1.35 (0.85 - 2.13)	7	0.71 (0.38 - 1.32)
<b>Upper-leg</b>	<b>10</b>	<b>1.04 (0.62 - 1.76)</b>	<b>11</b>	<b>1.11 (0.67 - 1.83)</b>
Muscle / tendon injury	10	1.04 (0.61 - 1.75)	11	1.11 (0.67 - 1.83)
<b>Knee</b>	<b>20</b>	<b>2.07 (1.43 - 3.00)</b>	<b>11</b>	<b>1.11 (0.67 - 1.83)</b>
Cartilage	4	0.41 (0.18 - 0.95)	3	0.30 (0.12 - 0.79)
Dislocation	2	0.21 (0.06 - 0.67)	0	
Joint Injury	2	0.21 (0.06 - 0.67)	1	0.10 (0.02 - 0.53)
Ligament Injury	12	1.24 (0.77 - 2.01)	6	0.61 (0.31 - 1.19)
Muscle / tendon Injury	0		1	0.10 (0.02 - 0.53)
<b>Lower-leg</b>	<b>4</b>	<b>0.41 (0.18 - 0.94)</b>	<b>4</b>	<b>0.40 (0.17 - 0.92)</b>
Ligament Injury	1	0.10 (0.02 - 0.54)	0	
Muscle /tendon injury	2	0.21 (0.06 - 0.67)	4	0.40 (0.18 - 0.93)
Nerve injury	1	0.10 (0.02 - 0.54)	0	
<b>GHJT* &amp; Upper Arm</b>	<b>11</b>	<b>1.13 (0.69 - 1.86)</b>	<b>17</b>	<b>1.72 (1.15 - 2.57)</b>
Dislocation	4	0.41 (0.18 - 0.95)	1	0.10 (0.02 - 0.53)
Muscle / tendon Injury	5	0.52 (0.25 - 1.09)	15	1.52 (0.99 - 2.33)
Shoulder jar/joint	1	0.10 (0.02 - 0.54)	0	
Nerve injury	1	0.10 (0.02 - 0.54)	1	0.10 (0.02 - 0.53)
<b>Head &amp; Neck</b>	<b>35</b>	<b>3.62 (2.73 - 4.79)</b>	<b>12</b>	<b>1.21 (0.75 - 1.95)</b>
Ligament injury	1	0.10 (0.02 - 0.54)	0	
Concussion	33	3.42 (2.56 - 4.56)	12	1.21 (0.75 - 1.96)
Nerve injury	1	0.10 (0.02 - 0.54)	0	

\*GHJT, Glenohumeral Joint

**Supplementary table 3 - A sample phase of the intervention exercise programme. In this case, Phase 3 of the adult men's community rugby programme.**

	Exercise		Repetition/duration
<b>Part 1 (~10 minutes)</b>	Small sided games	For the first 5 to 10 minutes of training, while players arrive, use small sided games to promote player movement, helping raise body temperature and act as a pulse raise exercise. Groups should be no larger than 6 per side.	5 - 10 minutes
	Snake runs with back skip	In a 15m channel that's about 5m wide, players run a snaked course forwards and then perform a backward skip to return, while facing forwards throughout. Perform the first repetition slowly (30% effort) building to a high-moderate pace (70%) by the third repetition.	3 x 15m
<b>Part 2 (7 minutes)</b>	Lunge and reach	In a 15m channel: Players lunge forwards reaching arm up and above their heads. Stretch through the groin of the rear leg. Rear knee should not touch the ground and front knee should track over the front foot, maintaining the torso in an upright position.	2 x 15m
	Heel to toe walk with knee hug	In a 15m channel: Players walk out emphasising heel contact by pulling the toes up toward their shins. Players step through into a calf raise which is held for 2 seconds while they pull the lead leg up into their chest.	2 x 15m
	Single leg balance with eyes closed	Players stand on a single leg and balance. The free leg must not touch the ground or make contact with the stance leg. Players close their eyes and aim to balance for 30 seconds.	1 x 30 seconds on each leg
	Isometric shoulder abduction	In pairs, one player holds their arms ~10degrees away from the body. This player tries to raise their arms to the side (80% effort) while the partner resists all arm movement.	2 x 15 second efforts each player
	Isometric shoulder external rotation	In pairs, one player bends their elbows keeping the elbows by their sides. The player tries to externally rotate their arms (80% effort) while the partner resists all movement.	2 x 15 second efforts each player
	Bent hip Nordic curl	In pairs, both players kneel on the ground. In a high kneeling position one player bends at the hip about 30 degrees while the partner holds their ankles securely. Maintaining a rigid torso the first player leans forward controlling their descent to the ground.	1 x 8 each player

<b>Part 3 (5 minutes)</b>	Ankle pogos	In a 15m channel: Players jump forwards slightly, only using the power of their calf muscles. Knees, hips and torso allow minimal movement. The heels should not touch the ground and toes should be pulled up during flight. Players ground contact is through the ball of the foot to use their lower leg elasticity.	2 x 15m
	Double hop and stop	In a 15m channel: players hop forward two times covering maximum 'controllable' distance. Players must 'stick' and hold the second landing maintaining their balance for 4 seconds. Focus is on the alignment of the lower limb. If balance can not be maintained, shorten the hop length.	1 x 15m each leg
	Push-up plus variant	Start position: Players assume a press-up position with their hands shoulder width apart and inline with their shoulders. Using minimal elbow bend, players retract then explosively protract the shoulder girdle. Players quickly move their hands during the flight toward their eye line from inline with the shoulder. The action is repeated moving the hands back inline with the shoulders. There should be minimal rest between movements.	2 x 10
	Lunge jumps	From a lunge position, players jump powerfully maximising their arm drive. And alternating the lead leg each jump The hind knee should not touch the floor. Both knees should be ~90 degrees in the lunge position and the torso should be upright throughout. Maintain front knee alignment over toes during lunge.	1 x 10
	Figure 8 drill	Using an imaginary 2m x 1m grid, payers complete as many figure 8 movements as possible in 30 seconds. Players must always face forward.	1 x 30 seconds
	Shoulder walkouts	Players stand with feet shoulder width apart. Keeping their legs straight, players reach down to the floor and walk their hands forward as far as possible then walk them back and repeat. Players must brace their trunk to maintain a neutral spine position, allowing minimal body 'sway'. If a neutral spine position is not maintainable, do not walk hands as far forwards.	2 x 5
<b>Part 4 (2 minutes)</b>	30:30 Shuttle sprints	Cones are placed every 5m. Players are divided into 2 groups (i.e., forwards & backs). One group at a time, players sprint out and back to each cone in the order: 5m, 10, 15, 20m,25m, 20m, 15m, 10m, 5m continuing as time permits. This is a maximal effort drill. While one group exercises for 30 seconds, the other group performs neck strengthening exercises.	2 x 30 seconds each group
	Isometric neck holds	Players push against their own head offering maximum resistance. The exercise is performed pushing forwards and backwards (set 1) and then from the left and from the right (set 2). Each hold lasts 15 seconds. The exercise is to be completed during the 30:30 shuttle rest periods.	1 x 15 second hold in each direction

