

### Injury Prevention in Gaelic Games

Since 2006, the GAA Medical, Scientific and Welfare Committee has been working with UCD Physiotherapy in developing a framework for injury prevention in Gaelic games. The **first phase** of this has been the development of the National GAA Injury Database, where participating inter-county teams have registered injuries throughout the playing season. We now have information which gives us a clear picture of the **type, nature and mechanisms of injuries** incurred in football and hurling. Key results are that:

- Two-thirds of players get injured and 1/3 have more than one injury in any season. One quarter of injuries are recurrences of existing or old injuries.
- Over 75% of injuries are to the lower limbs and the majority are to the 'soft tissues' i.e. muscle, ligament and tendon, with hamstring strains being the single biggest problem (17-23%). Knee and ankle sprains and groin and pelvis muscle/tendon problems each account for about 10-12% of all injuries.
- Approximately 1/3 of injuries occur in direct player contact situations, with the remaining 2/3 being non-contact injuries. These non-contact injuries most commonly occur in sprinting (rapid acceleration and deceleration), jumping/landing and, rapid changes of direction (plant/cut) manoeuvres.

### Development of the 'GAA' 15 Injury Prevention Programme

The **second phase** in developing the framework for injury prevention was to **explore risk factors for injury** in our own GAA data as well as in other sports internationally and then to move on to looking at the evidence for injury reduction. There has been extensive research into the biomechanics of non-contact injury in sport and one risk factor which has been identified is poor neuromuscular control in the player. By neuromuscular control we mean the body's ability to stabilise, correct, control and withstand the forces demanded in the course of training and play. There is evidence that neuromuscular control can be trained, so some injuries may be prevented or reduced through exercise based training. We know from the research that some but not all training programmes have shown benefits, but these had never previously been adapted for or tested in Gaelic games.

We therefore;

1. Conducted a thorough re-analysis of research findings from high quality studies of exercise training for injury prevention. From over 1,200 studies, 23 made it into the pooled analysis and there statistically significant evidence for three types of training was found; a) multifaceted neuromuscular training programmes like the FIFA 11+, b) balance board exercises and c) hamstring strengthening protocols.
2. Developed a proposed GAA specific injury prevention training programme with the GAA Medical, Scientific and Welfare Committee. This was designed as a 15 minute warm-up which fitted into current training practice and did not require additional equipment.



### Testing the 'GAA 15'

The 'GAA 15' was tested in 4 college teams (2 hurling and 2 football) in already trained players (aged 18-20 years). Half undertook the 'GAA 15' injury prevention programme - the drills were practiced twice a week at the start of training and incorporated into pre-match warm up - and half continued with regular training over an 8 week period.

Two key outcomes that have been associated with injury risk were assessed:

1. Dynamic balance, i.e. the ability to control balance on one leg while reaching out to the extremes of stability with the other (assessed using the Y Balance Test).
2. Landing mechanics (assessed using The Landing Error Score System(LESS) Test).

The test found that there were no adverse reactions to implementing the 'GAA 15' injury prevention programme and it was acceptable to players and coaches. There was also a significant reduction in landing error (LESS) in the injury prevention group by comparison with the 'regular training' group. The 'GAA 15' injury prevention programme was also tested with a minor team, for effectiveness, feasibility and safety. Significantly, the benefits were replicated in the under 18 players.

### What does this mean for you as a Coach?

- Exercise based training which targets neuromuscular control is proven to reduce lower limb injury in sport.
- The GAA tailored programme is safe and effective in improving neuromuscular control, which reduces injury risk factors.
- Key activities are dynamic warm-up, core stability and muscle activation, sport-specific dynamic balance, landing techniques, plyometrics, plant and cut, hamstring strengthening
- Activate core and posterior leg muscles
- Train SOFT LANDING i.e. land on toes, not flat footed. Keep KNEES OUT, BEND KNEES when you land.
- Make players aware of how they move
- Neuromuscular training for injury prevention is about training movement control, stability, reactive ability and agility.
- These skills are also inherent sport specific skills - so games based training, performance enhancement and training for injury prevention go hand in hand.
- Like any motor skill, players need to **PRACTICE consistently** and if they don't, the benefit declines
- The idea of training to prevent injury should start early to develop good biomechanics and movement control.
- Important in transition from child to youth level – changing mechanics and body mass.

# 'GAA 15' Structure of the Warm Up

Duration – 15 minutes

The GAA 15 has 3 Sections comprising of six types of activity with a total of 19 exercises, which should be performed at the start of each training session. It is important to use proper technique during all of the exercises.

## SECTION 1 – Part A : Running [Max 5mins]

**PART A:** Running exercises at a slow speed

## SECTION 2 – Parts B, C, D & E : Improving the Mechanics and limiting risk of injury [Max 7mins]

**PART B:** Strengthening exercises focussing on the core and legs

**PART C:** Balance and controlled partner contacts

**PART D:** Jumping

**PART E:** Hamstrings

## SECTION 3 – Part F : Sports Specific Movement [Max 3mins]

**PART F:** Sport specific exercises at moderate / high speed combined with planting/cutting movements

Prior to matches only the running exercises (Parts A & F) should or may be performed.

# PART A | RUNNING

Duration – 5 minutes (max.)

## 1. SLOW RUN



### TEACHING POINTS

1. Jog to the 20m line.
2. Make sure you keep your upper body straight.
3. Your hip, knee and foot are aligned.
4. Do not let your knee buckle inwards.
5. Jog back to start line.
6. Repeat twice

## 2. HIP OUT



### TEACHING POINTS

1. Jog five steps, stop and lift your knee forwards.
2. Keeping your upper body facing forward, rotate your knee to the side and put your foot down
3. Leg you are standing on stays straight, heel on the ground.
4. Do not allow knee of stance leg buckle inwards.
5. Raised leg: hip, knee and ankle in line
6. After five more steps, repeat exercise on the other leg.
7. Repeat until you reach the 20 m line.
8. Jog back.
9. Repeat twice

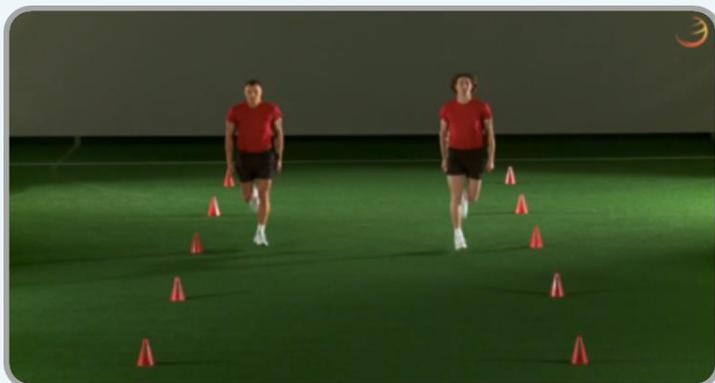
## 3. HIP IN



### TEACHING POINTS

1. Jog five steps, stop and lift your knee to the side.
2. Keeping your upper body facing forward, rotate your knee forwards and put your foot down.
3. Make sure that the leg you are standing on stays straight.
4. After five more steps, repeat exercise on the other leg.
5. Repeat until you reach the 20m line.
6. Jog back.
7. Repeat twice

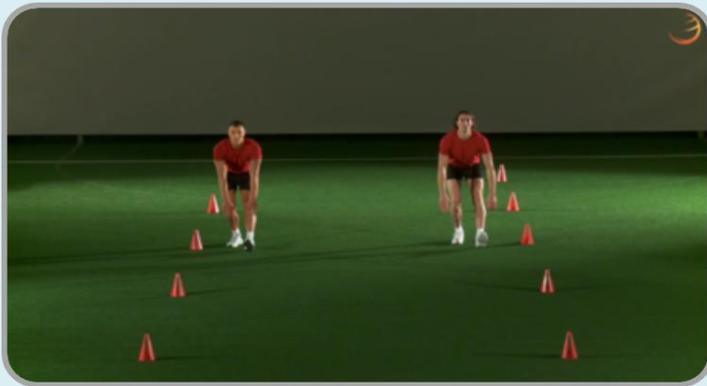
## 4. HEEL FLICKS



### TEACHING POINTS

1. Jog towards the 20m line.
2. Taking short strides flick your heels towards your glutes.
3. Maintain your upper body up straight.
4. Your upper thigh should remain perpendicular to the ground. Jog back to the end line.
5. Complete twice.

## 5. TOUCH TOES



### TEACHING POINTS

1. Jog 5 steps, place one leg out in front, toes pointing up, heel into ground, straight knee.
2. Keeping your back straight, bend the knee at the back and roll your hand/hurley down the front of the shin.
3. Hold for 3 seconds.
4. Jog another 5 steps and repeat on opposite leg.
5. Continue until you reach 20m line, jog back.
6. Complete twice.

## 6. RUN (50%)



### TEACHING POINTS

1. Run at 50% of your max pace to the 20m line then jog back.
2. Keep your upper body straight.
3. Hips, knees and ankles should be aligned.
4. Complete twice.

## 7. RUN (80%)



### TEACHING POINTS

1. Run at 80% your max pace to the 20m line then jog back.
2. Maintain your posture and keep your upper body straight through the end line.
3. Hips, knees and ankles aligned.
4. Complete twice.

## PART B | STRENGTHENING

Duration - 4 minutes (max.)

### 8. SINGLE LEG BRIDGE



#### TEACHING POINTS

1. Lying on your back with your knees bent, and feet flat on ground, rest your hands down by your side and relax your shoulders back and down.
2. Bring one knee towards your chest and keep it there throughout all reps.
3. Push your whole flat foot into the ground.
4. Squeeze your glute muscles and lift your hips off the ground.
5. Hold for one second and lower back down to an inch off the ground, and repeat for **8 reps**.
6. Then swap feet.
7. Complete 8 times (Four each leg)

### 9. FORWARD LUNGE (GLUTEAL ACTIVATION)



#### TEACHING POINTS

##### Starting position

- Stand with feet hip-wide apart, hands on your hips.

##### Exercise

1. Lunge forward slowly at an even pace.
2. Bend hips and knees slowly until your leading knee is flexed to 90 degrees.
3. The bent knee should not extend beyond the toes.
4. Squeeze glutes on the trail leg.
5. Raise your hands straight up in the air, keeping your abdomen muscles tight.
6. Hold for count of two seconds and then walk forward with trail leg and repeat.
7. Complete 6 times.

##### Important

- Do not let your knee buckle inwards.
- Keep upper body straight and pelvis horizontal.

### 10. REVERSE LUNGE



#### TEACHING POINTS

##### Starting position

- Stand with feet hip-wide apart, hands on your hips.

##### Exercise

1. Step right leg backward, bringing your right knee towards the ground into lunge position.
2. Push off front foot and return to standing.
3. Complete 6 times.
4. Repeat on left leg.

## 11. SQUATS



### TEACHING POINTS

Complete Level 1 OR Level 2 Exercises depending on ability

#### LEVEL 1 ~ DOUBLE LEG SQUAT

- Reps – 8
- Sets - 2

#### Starting position

- Stand with feet hip-width apart, hands on the opposite shoulders.

#### Exercise

1. Slowly bend hips, knees and ankles until your knees are flexed to 90 degrees, as if you are going to sit on a chair behind.
2. Keep your chest up, head up, back straight and elbows pointing forwards.
3. Return to standing.
4. Slowly lower down again, and straighten up slightly more quickly.
5. Repeat for 30 sec. 2 sets.

#### Important

- Do not let your knee buckle inwards, keep in line with toes.

#### LEVEL 2 – SINGLE LEG SQUAT

- Reps – 8
- Sets - 2

#### Starting position

- Stand on one leg.
- Bring opposite knee up towards your torso, cross your hands across your chest, elbows pointing away from body.

#### Exercise

1. Slowly bend your knee, if possible until it is flexed to 90 degrees, and straighten up again
2. Bend slowly then straighten slightly more quickly
3. Repeat on the other leg
4. 6 squats on each leg.

#### Important

- Do not let your knee buckle inwards.
- Keep upper body facing forward and pelvis horizontal.

## 12. CORE DRILLS



### TEACHING POINTS

#### FRONT PLANK

##### Starting position

- Lie on your front, support upper body with forearms.
- Elbows directly under shoulders.

##### Exercise

1. Lift upper body, pelvis and legs up until your body is in a straight line from head to foot.
2. Pull in stomach and gluteal muscles and hold the position for 30 seconds
3. Repeat twice



#### SIDE PLANK

##### Starting position

- Lie on your side with both legs straight, support yourself on forearm and your foot.
- Elbow of supporting arm directly under shoulder.

##### Exercise

1. Raise pelvis and legs until your body forms a straight line from the uppermost shoulder to the uppermost foot.

**Complete Level 1 OR Level 2 OR Level 3 Exercises depending on ability**

#### LEVEL 1

- Start in front plank position, turn onto side into side plank position without dropping hips to the floor, return to front plank, turn onto side plank, and return to front plank
- Hold for 6 seconds in each position

#### LEVEL 2

- As in level one except in front plank lift right leg in air x 5 sec, repeat on left, lift right arm up x 5 sec, repeat on left.
- In side plank position lift top leg up x 5seconds.

#### LEVEL 3

- In front plank position lift right arm and left leg together for 3 seconds and repeat with opposite leg and arm.
- In side plank lift make small circles with your top leg x 5 seconds.

# PART C | BALANCING

Duration – 1 minute (max.)

## 13. SINGLE LEG DEADLIFT



### TEACHING POINTS

1. Stand on one leg, extend free leg backwards and extend arms forward to touch hands with partner.
2. Keep spine straight and tighten stomach.
3. Allow standing leg to bend slightly at knee but keep knee, foot and ankle in straight line, do not let knee buckle.
4. Trail leg must be straight, toes pointing towards the ground pulled towards shin.
5. Return to standing on one leg bringing trail leg forward and bend knee towards chest.
6. Repeat on same leg.

Complete Level 1 OR Level 2 OR Level 3 Exercises depending on ability

### LEVEL 1

- 6 reps each leg

### LEVEL 2

- Perturbation in standing
- Partners stand side by side.
- When return to standing each time one partner tries to push the other off balance in different directions.
- 6 reps each leg

### LEVEL 3

- Single leg lunge with a heel lift
- When return to single leg stance stand up on your toes, then slowly lower down again before repeating the sequence.
- 6 reps each leg

# PART D | JUMPS

Duration – 1 minutes (max.)

## 14. JUMPS



### TEACHING POINTS

Complete Level 1 OR Level 2 OR Level 3 Exercises depending on ability

#### LEVEL 1

##### Counter movement jump double leg

- Reps – 8
- Sets – 2

##### Starting position

Stand with your feet hip-width apart, hands on your hips.

##### Exercise

1. Slowly bend hips, knees and ankles until your knees are flexed to 90 degrees.
2. Lean upper body forwards.
3. Then jump as high as you can, and straighten whole body. Land softly on the balls of your feet, with your knees bent.

##### Important

- Jump off both feet.
- Land gently on the balls of both feet with your knees bent.

#### LEVEL 3

##### Lateral Jumps to single leg land, side to side

- Reps – 8
- Sets – 2

##### Starting position

- Stand on one leg.
- Bend hips, knee and ankle slightly and lean upper body forwards.

##### Exercise

1. Jump from your supporting leg approximately 1m to the side onto the other leg.
2. Land gently on the ball of your foot and bend your hips, knee and ankle.
3. Hold this position for about a second and then jump on the other leg.

#### LEVEL 2

##### Box jumps

- Reps – 8
- Sets – 2

##### Starting position

- Stand with feet hip-width apart, imagine a cross you are standing in the middle of.

##### Exercise

1. Jump with both legs forwards and backwards, from side to side, and diagonally across the cross.
2. Keep upper body slightly leaned forwards. Jump as quickly and explosively as possible, with SOFT LANDING.

##### Important

- Land softly on the balls of both feet.
- Bend hips, knees and ankles on landing.
- Do not let your knee buckle inwards.

##### Important

- Do not let your knee buckle inwards.
- Keep upper body stable and facing forward and pelvis horizontal.

# PART E | HAMSTRINGS

Duration – 1 minute (max.)

## 15. HAMSTRINGS – NORDIC HAMSTRING CURLS



### TEACHING POINTS

Complete Level 1 OR Level 2 OR Level 3 Exercises depending on ability

*Note: Nordic Hamstring Curls may not be suitable for all players. For less developed players use an eccentric hamstring curl.*

### Starting position

- Kneel with knees hip-width apart; partner pins your ankles firmly to the ground with both hands.

### Exercise

1. Slowly lean forward, while keeping your body straight from the head to the knees.
2. When you can no longer hold the position, gently take your weight on your hands, falling into a press-up position.

### Important

- Do exercise slowly at first, but once you feel more comfortable, speed it up.

### LEVEL 1

Reps – 3 -5

### LEVEL 2

Reps - 7-10

### LEVEL 3

Reps - 12-15

## PART F | SPORT SPECIFIC

Duration – 3 minutes (max.)

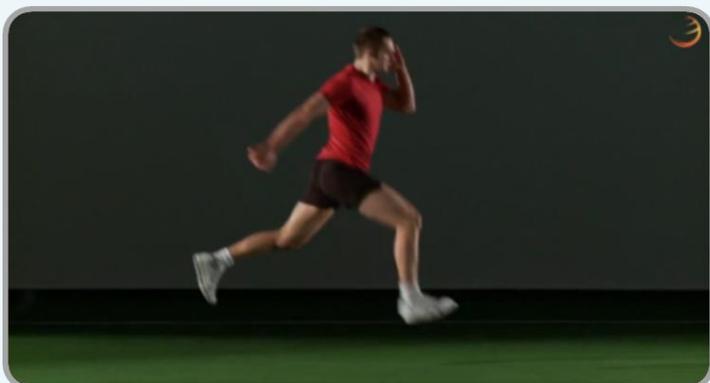
### 16. SPEED RUN (80%)



#### TEACHING POINTS

1. Run approx 20m across the pitch at 75-80% of maximum pace and then jog back.
2. Keep your upper body straight.
3. Your hip, knee and foot are aligned.
4. Do not let your knees buckle inwards.
5. Jog easily back

### 17. PLYOMETRIC BOUNDING



#### TEACHING POINTS

1. Take a few warm-up steps then take 6-8 high bounding steps with a high knee lift and then jog back.
2. Focus on technique
3. Repeat twice

#### Technique

- Lift the knee of the leading leg as high as possible and swing the opposite arm across the body.
- Keep your upper body straight.
- Land on the ball of the foot with the knee bent and spring.
- Do not let your knee buckle inwards.

### 18. PLANT AND PUSH WHILE JOGGING



#### TEACHING POINTS

1. Jog 4-5 steps straight ahead.
2. Then coach will indicate that player must turn left and the person must plant on the right leg and cut to change direction to the left and accelerate.
3. Sprint 5-7 steps (80-90% of maximum pace) before you decelerate.
4. Coach will indicate right and person must plant on the left foot and cut to change direction to the right.
5. When changing direction, bend knee and hip, lean body forwards.
6. Do not let your knee buckle inwards. Repeat the exercise x 30 seconds.

Progress to Main Section of Training Session

#### LINKS AND RESOURCES

- Learning GAA Portal – <http://learning.gaa.ie>
- GAA 15 App – Search for Salaso – Injury rehab on [iTunes Store](#).
- GAA 15 Videos – <http://learning.gaa.ie/GAA15>