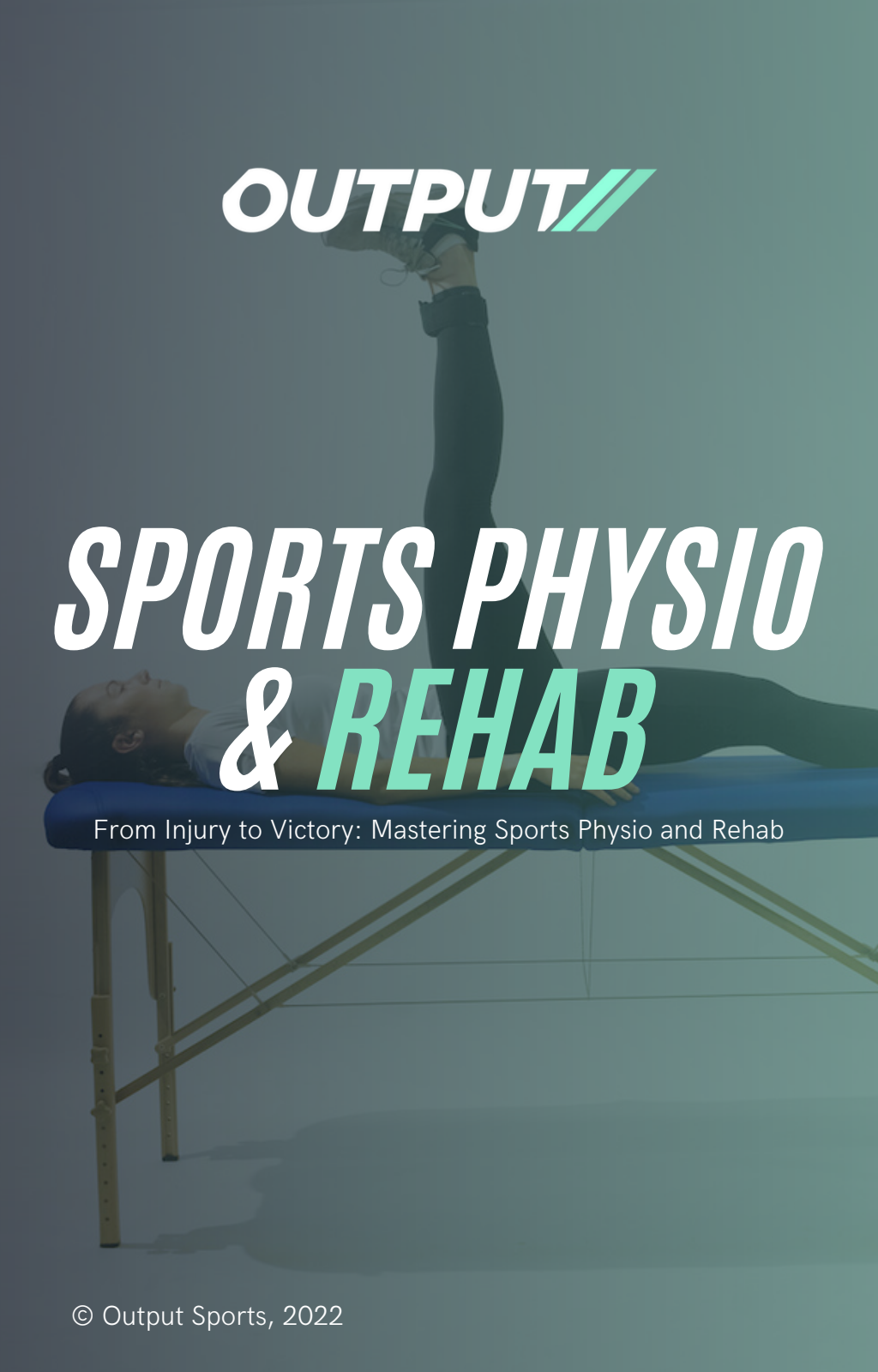

OUTPUT

SPORTS PHYSIO & REHAB

From Injury to Victory: Mastering Sports Physio and Rehab

OUR STORY

Output Sports technology stems from interdisciplinary research which commenced in 2013 between Physiotherapists, Sport-Scientists, Engineers and Data-Scientists in University College Dublin. Our team's mission is to bring elite level Sports-Science processes to a wider audience than ever previously possible so that mitigating injury risk and optimising athletic development may be understood more objectively and achieved more effectively.

WHY PHYSIO?

Physiotherapy has always been part of Output's DNA with two of the company's founders (Dr. Darragh Whelan, Prof Brian Caulfield) being qualified physiotherapists. Both Darragh & Brian have always been passionate about making rehabilitation decisions based on objective data, rather than subjective evaluation & have extensive research in the area of using technology to help with the same.

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ROB MCCABE, HEAD PHYSIO

Rob McCabe combines working with elite inter county footballers and running his own private practice. This allows him to work with a wide variety of athletes and patients. At all levels Rob has identified the need for tools that can objectively quantify performance efficiently.

BASELINE TESTING:

In a sporting context, Rob has found Output especially useful for baseline testing. "Preseason testing for range-of-motion and strength/ power scores is vital in developing a needs analysis for athletes. Output Capture has provided me with an extremely useful tool to record scores and visually show the player and coaches where the athlete is on the performance spectrum."

PLAYERS OF CONCERN:

"Although playing at elite level and playing well we had a player with recurring soft tissue injuries. Using the 10- 5 test in Output Capture we saw that his RSI scores were way below that of high performing athlete. With this information, we have been able to tailor more specific plyometric work for this player to make him more robust for the load tolerance required at his playing level."

EASE OF USE:

Rob has found the main benefit of Capture is its ease of use, particularly in environments where time is a major issue. "Output is quick and easy to use in a team setting. Athletes can even self-test with Capture before each session to monitor their own readiness to train. This enables them to see if their scores are below where they typically should be and if so, address this with the physiotherapy team, thereby improving efficiency. I now have more hard data to work with based on reliable and valid measurements. This has allowed improved decision making around performance and return to play."

THE IMPORTANCE OF OBJECTIVE ASSESSMENTS

During rehabilitation, performance testing and tracking is vital to ensure patients reach their rehab goals in a safe and efficient manner. It is usually completed using two distinct methods – subjective and objective analysis.

OBJECTIVE ANALYSIS

Objective analysis traditionally involves using equipment such as 3D motion capture, force plates, laser-based and EMG systems. Such equipment can accurately estimate key performance indicators such as joint kinetics, kinematics and muscle activity. They provide objective data that is consistent and reliable which allows for informed decision-making and the ability to demonstrate progress to the patient. However, access to this equipment is often limited to elite athletes and researchers (1).

Examples of traditional objective performance analysis tools including force plates, linear positional transducers and laser based systems.

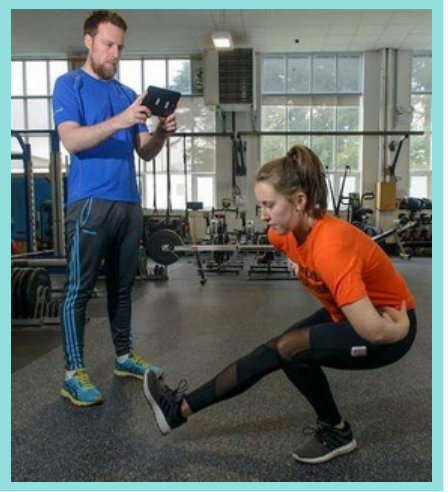
Even when available, the equipment is very expensive in terms of initial outlay & general upkeep. Furthermore, it is time consuming to set up correctly and interpret the data obtained.

SUBJECTIVE ANALYSIS

Subjective analysis primarily involves visual evaluation of an athlete. It is quick, inexpensive, and requires minimal equipment. However, evaluating performance in this manner often involves the use of ambiguous grading criteria and practitioner intuition, leaving it prone to bias. This is compounded by the difficulty of having to simultaneously assess numerous performance components. Furthermore, it is difficult to demonstrate improvements to clients when assessing performance in a subjective manner due to the lack of hard data points.

But, perhaps the most challenging aspect of subjective analysis is ensuring consistency of measurement with research indicating varying levels of agreement at an inter & intra rater level. This agreement is influenced by factors such as clinician experience as well as the complexity of the screening assessment itself. This means an athlete's performance levels and/or risk of injury may be incorrectly stratified (i.e. high risk or low risk) depending

on when they were assessed, and the practitioner involved. It can also lead to the potential for different practitioners to change athlete management based on interpretation, compromising continuity of care.



Subjective visual evaluation of an individual's movement kinematics during a single leg squat

size means that devices that incorporate them, such as the Output system, are generally small and unobtrusive meaning they can be used outside of laboratories and in gym settings.

For these reasons, IMUs have become increasingly common in sports and rehab settings to assess performance. These devices can be augmented with desktop tools that allow athletes and patients to track their progress and ensure they reach goals in a safe and effective manner.

HOW OUTPUT CAN AID OBJECTIVE ASSESSMENTS

Inertial Measurement Units can acquire tri-planar inertial acceleration and rate of angular rotation. With appropriate signal processing they are capable of providing data that is objective, accurate and reliable in a variety of performance tasks (2,3). Their

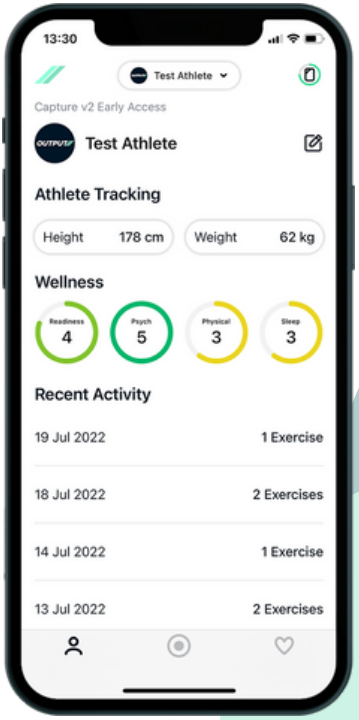
CLINIC SET-UP: GET THE MOST OUTPUT FROM YOUR PROCESSES

Set up an always-on output station: At the start of each day open the Capture app, pair up your sensor unit and have it to hand for patients coming through the doors.

Favourite your most common assessments: Straight-leg raise? Unilateral counter-movement jump? Favourite your most common assessments in the Capture app so they are just one click away when working with your clients.

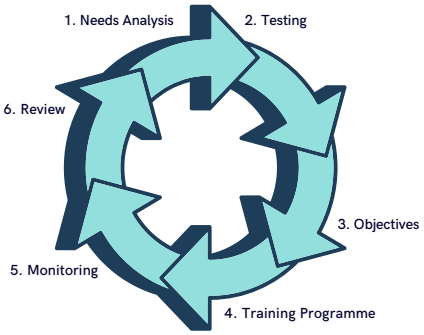
Create return-to-performance pathways: Stability, mobility, strength, power, reactive speed, plyometrics and sprint analysis. For each common injury you rehab, create a pathway of objective measurements to help optimise the journey.

Create client report templates: Once you have your rehab pathways set-up, use the Hub to create PDF templates to send your patients home with based on your assessments. These can be generated in seconds and are a great way to create client buy-in to the return to performance process.



INJURY RISK MITIGATION

In recent times, the role of physiotherapists has expanded considerably to not only treat injuries, but also develop strategies for injury risk mitigation. Patients who stay injury-free get more opportunity to partake in exercise. This leads to a positive cycle, as the more they train, the more robust they become, reducing likelihood of future injury.



The cycle diagram, pictured left, is a basic breakdown of the training planning process that underpins an effective injury risk mitigation programme with a soccer athlete

1. NEEDS ANALYSIS:

There needs to be a clear rationale for every intervention you put into place and carrying out a thorough needs analysis is how it all begins. The following categories should be investigated:

- Sports Profile (general rules/time motion analysis/physiological demands/biomechanics demands)
- Injury Profile (type/mechanism/rate)
- Player Profile (age/gender/position/training age/injury history)

The following is a brief outline of soccer demands:

- Intermittent in nature (high intense actions intertwined with more prolonged low intense activity) (4).
- Players hit up to 9-14km in total distance, with 1-3km high-intensity distance (5).
- Sprinting occurs roughly every 90-120 seconds lasting 2-4 seconds (6).
- Players perform 150-250 short, intense actions, with 1200-1400 changes of direction (7)

2. TESTING

Once you've completed a full needs analysis, selecting the relevant tests should be straightforward. The needs analysis acts as the road map, providing a rationale for specific testing to be carried out.

Having in-depth knowledge of these principles is fundamental and understanding concepts such as variability (standard deviation), effect size, z-scores and confidence intervals are essential for test analysis and interpretation. This knowledge provides practitioners with reliable and valid information to aid in decision making further down the road. For further reading in these areas, readers are recommended to read the work of McGuigan (8). Due to time constraints and cost, laboratory testing can be inaccessible to many clinics; therefore, field-based tests are widely popular. It is recommended that testing is carried out up to 4 times a year (e.g., start of pre-season, end of pre-season, mid-season, and end of season). For a full testing battery outline for soccer, along with testing recommendations, readers are directed towards the work of Turner and Stewart (9).

3. OBJECTIVES

By coming together as a multi-disciplinary team (MDT), a more holistic approach is taken to help the client reach their highest potential. It is essential that there must be a rationale for each goal set, and the implementation of a needs analysis and testing battery, along with talking to the client & technical coaches, helps identify this rationale.

4. TRAINING PROGRAMME

An example of components of a hamstring rehab programme can be found in the case study section below.

5. MONITORING

To maximise effect, physios need to understand how certain interventions will produce a specific physiological response. This is where the monitoring of training load has become a significant element in enhancing performance and reducing soccer injuries. These should be assessed regularly in order to track changes over time.

Internal

- s- RPE
- Session Load (Duration X s-RPE)
- Strain

External

- Jump Height
- Mobility
- Reactive Strength Index
- GPS
- Volume Load

6. REVIEW

This is crucial as it helps identify what elements went well and not so well. In soccer, this can be done at the end of the season and can be completed through injury audits, post season performance testing & receiving feedback from the patient/client.

STRENGTHENING THROUGHOUT RANGE

The role of strength in athletic performance & rehab is well established; stronger athletes tend to perform better in athletic tasks and are at lower risk of injury (10,11). However, many tend to focus on increasing load or sets and reps as a means of progressing and applying overload, and this often comes at the expense of range of motion.

Strength training through a full range of motion leads to superior athletic performance compared to partial range of motion training (12-14). Strength training leads to the same increases in flexibility as a stretching program (15-17), but with the bonus of also making you stronger, which also improves performance and reduces injury risk. So, it might be a good idea to focus less on stretching and concentrate more on strength training with good technique and control through full ranges of motion.

OVERLOADING ECCENTRICS

Overloading eccentrics usually require access to heavy weight or a flywheel, but there is a very simple (but not easy!) overloading eccentric exercise - the Nordic Curl. One of the most common injuries in sports are hamstring strains and tears. Performing Nordic Curls as part of a rehab program appears to have a strong protective effect against hamstring injury (18,19).

The key with the Nordic is to focus on the quality of each rep and really fight against gravity as you lower yourself down slowly. Focus on progressing active range of motion (how low you can go before dropping to the ground) over time rather than increasing number of reps. Two sets of four high quality repetitions in a session is all you may need to reap the benefits (20,21). That is a large reward for an exercise you can perform with no equipment.

ISOMETRIC TRAINING

Isometrics are often the missing element in the later stages of many rehab programs. They can easily be completed at home with minimal equipment and confer many benefits for both performance and injury risk reduction (22,23). Performing isometrics at long muscle lengths may offer increased benefits (22) and is an easy way to make isometrics very difficult with minimal equipment. Below are examples of three isometric exercises commonly prescribed that require no equipment.

Single-leg Hamstring Isometric Hold
This exercise can be performed easily using a foam roller or just a few books stacked up. This is a great exercise for training the hamstring in a distally lengthened position (stretched at the knee joint). It may look easy, but it isn't. Focus on keeping the hips in and body in a relatively straight line and resist the urge to let the body slouch.

Rear-foot Elevated Split Squat Hold
This is a great exercise and challenges most of the lower limb musculature, including the groin (adductors) and hip flexors. You simply perform a rear-foot elevated split squat as normal but hold in the bottom position, or slightly above. This can be made even more difficult by holding weights in your hand. You may also modify this by elevating the front foot on a plate, with the heel floating to modify the focus of the exercise.

Copenhagan Adductor Hold
The Copenhagen adductor exercise appears to be quite effective in reducing the risk of groin injuries (24,25). Although there can be a dynamic element to this exercise, it places a large isometric demand on the adductors, or it can be performed in a purely isometric fashion. You simply use a bench or chair at an appropriate height and hold yourself in a side bridge position, supported by only one leg. This can be performed with bent knee (shortening the moment arm, making it easier) and progressed to straight leg.

PLYOMETRICS

Plyometrics require no equipment and can be an effective way of improving jumping, sprinting and change of direction ability (26-28), while also working on coordination and landing mechanics which may help to reduce injury risk (29).

Plyometrics involve training the stretch- shortening cycle action of muscles and usually consist of jumping, hopping, and bounding exercises.

Plyometrics can be defined as being either fast or slow depending on how long it takes the stretch-shortening cycle to occur, measured via ground contact time, which is how long the athlete is in contact with the ground when performing the movement.

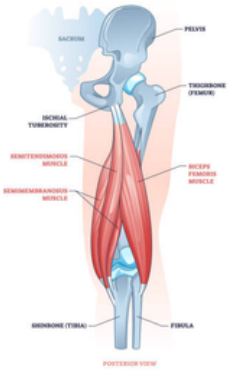
Fast plyometric exercises have ground contact times less than 250 milliseconds e.g., skipping or hurdle hopping.

Slow plyometrics have ground contact times longer than 250 milliseconds e.g., countermovement jumps. These ground contact times can be measured using the Output system.

Plyometrics may not look demanding, but they place high loads and demands on the body, so again, the key is to start conservatively with low volumes and gradually progress, focusing very much on technique and quality of movement.

INJURY CASE STUDIES: THE HAMSTRING

The Hamstrings group play a key role in knee joint flexion and hip extension and are involved in almost all of human movements; from walking to running, as well as many other physical activities. As a result, hamstring strain injuries are one of the most common muscular injuries.



It is thought that the occurrence of hamstring strain injuries is due to the combination of high forces with rapid muscle lengthening actions, as seen in high-speed running (30). In the late swing phase, the hamstrings rapidly change from acting eccentrically (decelerating the extended knee) to performing concentrically (supporting hip extension), which places them in a more susceptible elongated position under high mechanical stress. 90% of hamstring strain injuries are non-contact, which may in part be due to an ever-increasing metabolic demand of team sports combined with a higher proportion of matches spent running at high speed (31).

ASSESSING HAMSTRING INJURIES & REHAB

Hamstring strain injuries are typically graded medically from Grade 1 to Grade 3. A Grade 1 diagnosis is usually a mild pull or strain, and pain typically lasts a few days. A Grade 3 tear, however, can take several months to recover from. Grade 1 tears are the most common and usually a sudden pain and tenderness is felt, and it is painful during movement. Severe Grade 3 tears are very painful and are normally accompanied by a popping-like sensation at the time of injury. The primary recovery strategy is to rest the leg and try to avoid taking big strides. Other strategies such as keeping the leg elevated and short periods of ice and compression may help speed up recovery. The real key is not returning to sport and training too early, and slowly building up running based activities once pain and tenderness has subsided.

RISK FACTORS FOR HAMSTRING INJURIES

There are a number of established risk factors for hamstring strain injuries. Some of these we cannot modify such as advancing age, with older players suffering from a greater risk of injury. Previous hamstring strain injury is also a major risk factor. The long head of the Biceps Femoris muscle has the highest risk of both injury and re-injury (32). Re-injury typically results in longer periods of recovery than first-time incidences, highlighting the need to improve current prevention and rehabilitation strategies to reduce initial and subsequent hamstring strain injuries.

NORDIC HAMSTRING CURLS 

Nordic Curl strength training has been proposed as a method to prevent hamstring strain injuries (33). The Nordic Curl is the most widely researched eccentric training exercise. Large- scale soccer Nordic Curl interventions have been reported to reduce both first-time occurring hamstring strain injuries (34) and recurrent injuries (35) making it an exercise of particular interest. The Nordic Curl is an eccentric only exercise, placing load on the hamstring muscles whilst they are lengthening, which produces proposed beneficial adaptations in eccentric strength and muscle architecture.

With the Nordic Curl, it is important to gradually build up the number of repetitions and sets over time, starting with as few as 2-3 repetitions. As with any eccentric-based training, you can expect some DOMS after the first few sessions. The focus should be performing the contractions slowly and controlled throughout the movement with an emphasis on technique, trying to keep the hips square. Another consideration is that more recent evidence suggests similar adaptations and reduction in hamstring strain injury risk can be achieved with much lower training loads (2 sets of 4 rep's) (36,37).

From a programming perspective, it is important to try and limit the number of Nordics in periods where there are lots of high-speed running or intense periods of match play to avoid unnecessary fatigue and increase injury risk, this should also be a considering for coaches on when to programme Nordic Curl into an athletes' training programme (38). The Nordic Curl is an eccentrically overloading exercise and therefore should be progressed by increasing the "active" range of motion you can achieve.

CONCUSSION

Both on a sports field & in clinic, physiotherapists are increasingly tasked with assessing & developing rehabilitation programmes for concussion. Once assumed to be a short-lived transient injury, it is now becoming clear that the effects of concussion (and particularly repeated concussions) likely extend beyond the short term. An increasing body of evidence suggests that following a concussion, athletes possess a higher risk of sustaining both subsequent concussions (39) and musculoskeletal injuries (40-42) in the medium term.

Additionally, emerging evidence shows that there may be potential long-term impacts of repeated injuries on cognitive function, mental health and the development of neurological conditions (43-45).

ACUTE INJURY CARE

The current clinical standard for the management of sports related concussion involves the identification of the signs of concussion, and where appropriate, an on-field triage evaluation to assess the player's symptoms, orientation and evaluate if any red-flags are present. If a concussion is suspected, the player is removed from play and the on-field assessment is typically followed-up in the medical room with a clinical exam.

As mentioned above, as there are no gold-standard 'objective' markers of concussion, this examination is supported by various assessments to evaluate the athletes functional deficits, including clinical symptoms, sensorimotor function (balance, co-ordination and reaction time) Sports Concussion Assessment Tool (SCAT-5).

RECOVERY AND RETURN TO PLAY PROCESS

The traditional model of concussion recovery evaluation is centred around a process called the graduated return-to-play (GRTP) protocol. The GRTP is a phased process whereby after becoming asymptomatic at rest, athletes progress through six-steps which involves the gradual re- introduction of asymptomatic physical and skill-based activities. This means that the return to play of athletes is simply dictated by the length of time since the injury and the athlete reporting no symptoms (46).

GRADUATED RETURN TO PLAY TABLE

STAGE			ADULTS	U6-U20S
STAGE 0	**Rest:** Complete physical & cognitive rest. **Aim:** Rest, ensuring no activity that brings on symptoms.	REST	DAY 0 Day of injury DAY 1-2	DAY 0 Day of injury DAY 1-2
STAGE 1A	**Symptom limited activity:** Daily activities that do not provoke symptoms. Typical activities during the day as long as they do not increase symptoms (e.g. reading, screen time, light housework, walking). Start with 5-15mins and gradually build up. **Borg Rating 6-10:** Walking at a comfortable pace, breathing slightly increased. Must not worsen symptoms. Heart rate <50% maximum. Progress to next step when player has completed minimum 3 days at this level.	SYMPTOM LIMITED ACTIVITY	DAY 2 OR 3 UP TO DAY 5-6	DAY 2 OR 3 UP TO DAY 5-6
STAGE 1B	**Symptom limited exercise:** Exercise that does not provoke symptoms. Slowly build up the duration and intensity of the exercise. **Borg Rating 11-13:** Walking or jogging at a pace to cause minimal sweating, slight breathlessness and able to hold conversation. Non-contact activities. No resistance training. Must not worsen symptoms and heart rate <70% maximum. **Aim:** Gradual reintroduction of work/school activities without worsening symptoms.	SYMPTOM LIMITED ACTIVITY	DAY 5-6 at the earliest UP TO DAY 14	DAY 5-6 at the earliest UP TO DAY 14
	PLAYERS SHOULD NOT PROGRESS TO STAGE 2 IF THEY ARE STILL SYMPTOMATIC			
STAGE 2	**Increased aerobic exercise:** Exercise that causes increased heart rate and lasts for approximately 30-40mins. **Borg Rating 13-15:** Jogging/stationary bike at a pace to cause sweating, breathlessness and able to hold conversation without difficulty. Non-contact activities — No resistance training Must remain symptom-free — Heart rate <80% maximum **Aim:** Increase intensity and duration of exercise	INCREASED AEROBIC EXERCISE	DAY 15	DAY 15-16
STAGE 3	**Increased aerobic exercise:** Begin to reintegrate to team training by introducing ball work and rugby-specific drills but avoid contact. **Borg Rating 13-15:** Running drills building to max 60-80% effort (e.g. non-contact warm-up with the team). Balance exercises. Low-level resistance training (e.g. bodyweight exercises). No head impact/contact activities. • No contact • Individual handling skills • Static lateral passing (unopposed/no decision) 10-20m • Seerve run - 50/70% pace over 20m • Side step - 50/70% pace over 15m • Single leg standing with eyes closed • Single-leg squat (5-10) • Cross arms squat (5-10) • Press-ups (5-10) • Resistance band exercises **Aim:** Add movement and challenge coordination and balance.	RUGBY SPECIFIC EXERCISE	DAY 16	DAY 17-18
STAGE 4	**Non-contact rugby training drills:** Harder training drills e.g. passing drills requiring increased cognition as well as physical exertion. High level balance tasks. May start progressive resistance training building up to 60-70% 1-rep max (1RM) • No contact • Lateral passing (static opposition/cone) 10-20m • Dynamic lateral passing (e.g. 3v2 drill) • Position specific skills (e.g. kicking) • "Superman" balance x 5 • BOSU ball/wobble board exercises • Single-leg hop (forward and lateral) 6-8 each leg • Single-leg balance lateral passing (5 reps each side over 3-5m) **Aim:** Exercise that challenges coordination and required increased concentration.	NON-CONTACT ROBOTTRAINING DRILLS	DAY 17-18	DAY 19-20
	MEDICAL CLEARANCE SHOULD BE SOUGHT BEFORE ADVANCING TO STAGE 5			
STAGE 5	**Full Contact Practice:** Following medical clearance, participate in normal training activities and full contact practice. Aim: Restore confidence and assess functional skills by coaching staff.	FULL CONTACT PRACTISE	DAY 19-20	DAY 21-22
STAGE 6	**Normal Game Play:** If all previous stages have been completed successfully, the player may return to play on this day. Adults take a minimum of 21 days and U20s take a minimum of 23 days to progress through the GRTP	NORMAL GAME PLAY	DAY 21	DAY 22

Source IRFU

Despite athletes' symptoms typically resolving within a matter of days (49), there is a growing body of evidence suggesting that the consequences of concussion likely extend beyond this "clinical recovery". It is now known with a high level of certainty that athletes who have sustained more than one previous concussion are at a heightened risk of sustaining future concussions (50). Furthermore, athletes who have sustained a concussion, are more likely to sustain a future musculoskeletal injury following return to play (51). Emerging evidence has showed that the association may be related to the presence of subtle sensorimotor and neurocognitive deficits which persist beyond the resolution of the traditional signs and symptoms of concussion (52). What's more is these defects are not detected by traditional clinical assessment batteries, such as the SCAT5. In other words, disturbances in the way the brain processes its environment and controls the body's movements likely persist beyond the point at which an individual notices that obvious symptoms (headaches, dizziness, fatigue etc.) have resolved.

Over the last few years, research has focused on attempting to understand this relationship and develop clinical tools for the objective evaluation of sensorimotor control, that can be used by the average practitioner and athlete. To do so, inertial sensor technology (such as the Output Sports system) can be used.

This approach can provide the objectivity and sensitivity of laboratory based systems, while ensuring that the developed tools can be used accessibly across a range of sporting environments (53).

OUTPUT SPORTS & BURNLEY FC: CASE STUDY

Phil Pomeroy has been a physio with Burnley FC since 2010. He & the performance team in Burnley have been at the forefront of making the squad one of the most robust & fittest in the English Premier League. Along with the rest of the high-performance team in Burnley, he is constantly looking for methods to maintain the same standards.

"As a club we are always looking for new ways of improving players and mitigating potential injury risks. To help with this we collect baseline values on a range of different metrics including power, speed, mobility & balance. It is key that this data is reliable & valid in order to ensure decisions around player welfare can be made with confidence."

Providing accurate & valid data is only one part of the performance testing jigsaw according to Phil. "It is also vital that this data is collected in a time efficient manner & that any technology we use to do the same should be easy to use & integrate seamlessly into our practice. Otherwise too much time is spent collecting the data and not enough time actioning on it."

MOBILITY MEASUREMENTS

"We were initially drawn to Output by their ability to accurately measure a wide variety of performance metrics in a portable and user centric system. The Output system has proved it is capable of doing the same. Predominantly we have been using the system for mobility measurements in our players. It has allowed us to move away from goniometry and manual input, meaning testing is faster and far more objective."

READINESS TESTING

"We've also used the system for jump testing as an indicator of readiness to perform & to identify asymmetries in players. The nordic analysis feature has also allowed us to quantify eccentric hamstring strength & drive intent during those exercises in our players. Furthermore, because the system is portable, we have been able to do all of this testing while away from our main training centre in Barnfield. That has been incredibly useful in ensuring we can assess players immediately post game & ensure we do not miss any useful objective data."

OUTPUT SPORTS & BURNLEY FC: CASE STUDY

BALANCE TESTING

Beyond performance testing, the medical team in Burnley have also found the balance testing feature of Output Sports especially useful for feeding into their clinical reasoning during the diagnosis & tracking of head injuries.

"Diagnosing and assessing when appropriate to return to play following a concussion is multifactorial with a combination of subjective & objective symptoms allowing for the same. For us, one component that feeds into this is balance."

"To date, we have predominantly assessed these via subjective methods such as visual evaluation. Grading criteria such as the mBESS have allowed this to be somewhat more objective, but with Output we have been able to measure this with far more granularity than ever previously possible without more expensive or cumbersome equipment."

DATA ANALYSIS

"Being able to do multiple performance assessments with one system has been massively beneficial, especially when it comes to data analysis in the Hub. Being able to graph the data all in one place is very useful.

EASE OF USE

During their use of Output, Phil has been impressed by a number of different features.

"Output's technology has been incredibly easy to use. You just pop it on the athlete, press record & complete the test. The user interface has been simple enough to use that our players can self drive the system without us needing to be present!

IN GENERAL

"We've found the Output team great to deal with. They're always looking for methods of improving their system & understand the importance in practitioner input to help with the same."

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